Donald N. Frey Oral History

Interview number: 91.1.1673.75

Reminiscences and Interview Recorded: 28 January 1986

Part of the Edsel B. Ford Design History Center Oral History Project

Transcript digitized by staff of Benson Ford Research Center: 2023

Benson Ford Research Center
20900 Oakwood Boulevard · Dearborn, MI 48124-5029 USA
research.center@thehenryford.org · www.thehenryford.org

Note to Readers

The Automotive Design Oral History Project, Accession 91.1.1673, consists of over 120 interviews with designers and engineers conducted during the 1980s by David Crippen of The Henry Ford.

This copy was produced from a bound, hard copy final version of the interview.

For more information, please contact staff at the Benson Ford Research Center (research.center@thehenryford.org).

- Benson Ford Research Center staff, 2023

DESIGN ORAL HISTORY PROJECT

FREY, DONALD N.

1986

EDSEL B. FORD DESIGN HISTORY CENTER

Henry Ford Museum &
Greenfield Village

This is David Crippen of the Henry Ford Museum's Design History Center, and this is January 28, 1986. Today we're in the Bell & Howell building in Skokie, Illinois, near Chicago, and we are talking with Mr. Donald N. Frey, who is currently chairman of Bell & Howell and has had a long career in car engineering, product planning, and marketing with the Ford Motor Company. We would ask Mr. Frey to tell us his career narrative in his own language.

A I was born March 13, 1923, in St. Louis, Missouri. As it turned out, my parents at that time were both students at the University of Missouri at Rolla. My father was just finishing up his master's degree in metallurgy, and my mother, at least up to a reasonable period of time before I was born, was a student. I can't remember if I ever knew what her engineering field was, but she was a young engineering student. Very unusual. Never finished, because I came along, and two years after, my brother came, Stuart, who's still with the Ford Motor Company.

My mother's dead, and my father's still alive. He's eighty-six. In fact, I'm seeing him in not too many weeks near Orlando, Florida, where he lives. But I can't remember if they wanted me to be born in a hospital, which I was, which was also not common in those days, or whether they were on their way somewhere, and I came. Anyway, I was born in St. Louis. My father and mother returned to Rolla, so I actually was present at my father's graduation in 1923 with a master's degree. In 1983, on his sixtieth anniversary, I took my father back to Rolla and saw the house in which I was a small baby. At that time, it was the School of Mines and Metallurgy, Missouri having created such a college, because, historically, it had been a mining state. Not much any more, but at one

time, it was a very prominent state in lead and zinc mining, so they produced a school of mining and metallurgy as a state need. Subsequent to all this, it became a part of the University of Missouri system and is now the College of Engineering for the University of Missouri.

So, anyway, we went back there, and my father and I both enjoyed it. I enjoyed the place where I was a tiny baby. Subsequent to that, my father graduated and went off to his first job which was at the Gehrling Casting Company in Peoria, Illinois. It's a predecessor company of the Caterpillar Tractor Company. Old Caterpillar hands remember my father as a young metallurgist. So I lived in Peoria until 1925, which was the year my brother was born. Then we went from there, and I don't know why Dad left. He was, obviously, in good graces, because he became chief metallurgist for the Deere Company tractor works in Waterloo, Iowa, where my brother and I grew up for the next twelve years. I went all the way to high school.

Q A pleasant place to grow up?

A Yes. I am truly a product of a small town -- an Iowa community. At that time, it was quite a small place. I started high school there. And, indeed, last Fall I went back to Waterloo, having not been back there since I left in 1937. I found my grade school. It's still there. It's still functioning. I found my homeroom like that! The biggest kick in my homeroom was to sit in the back with a great big Bell & Howell projector. Boy! Talk about all the rows coming right together in one little knitted place.

I found my high school. I was outraged that they converted it to a middle school. Of course, in my day, schools were kindergarten to eighth, and then ninth through high school. No intermediate stuff. Now

it's an intermediate school, and they built a new high school on the edge of town.

Anyhow, I grew up in Waterloo right on the edge of town. In fact, we found a house that faced farms, and the back of the house faced the edge of town. I remember it fondly. It was the Depression years, of course. Not uncommonly, we didn't notice it. I do remember my mother and father doing things.

Q Was your father at Deere?

A Yes, all during those years. I don't think my father was ever laid off. I don't recall, anyway. I know the company went through a terrible crisis in the middle 'Thirties, like any other company. We grew up in a small town atmosphere. Thinking back at the schooling we got, it was tough, it was demanding. I had my share of troubles and foibles. In fact, when I was back last year I remember the principal's name was Clara McKittrick. I remember her. The present principal of my then grade school remembers her fondly. Said everybody remembered her. She did so and so, and so and so, so she still remembered, and I remembered her. She was every schoolboy's vision of a teacher: white haired, statuesque, a class act. And I remember so clearly when I graduated from eighth grade, I was going on downtown the following fall to go to high school -- West Waterloo High School. There were two high schools -- East and West. I was going to West. She called me in her office, and I remember she told me, she said, "You're probably the finest student I'll ever have, and I expect you to live up to it." That was Clara McKittrick. I think she died in the late 'Fifties. I do remember corresponding with her briefly, so there was some contact with her prior to that. I never did ask if I was doing all right. I never get around to asking her that.

I remember a lot of things very fondly about that period. A lot of things were clearly the precursors of things to come in terms of what I did with my life. I always liked machinery. I always built things. Interestingly enough, in high school, in those days -- this is pre-World War II -- girls were required to take home economics, which, I suppose, is a passe' term now, and boys had to take what they called manual training. And out of that, I became, and to this day, I have a hobby -- cabinet making. In fact, I could make myself a living as a carpenter and a cabinetmaker.

Q Woodworking?

A In woodworking. In fact, I have a complete woodworking shop in a high rise downtown. I learned it all in high school, taking manual training. I can remember what I made, and the machinery I learned to use. I remember learning to use a lathe, and like all neophytes, got a tool caught in a wrong angle, and I hit myself in the jaw with it. I practically knocked myself silly with that blade tool.

I remember writing in grade school and being a part of the Washington Irving Sketchbook. My grade school was called the Washington Irving grade school, named after one our great American authors. The newspaper was called the Sketchbook that honored his own writing. I can remember reading Ichabod Crane, Rip Van Winkle stories and The Hudson Valley stories, and got such a kick out of them many years later visiting Washington Irving Home near Croton-on-Hudson. I'm sure nobody knew of my joy of having lived with his stuff. As a young boy, I was reading all this stuff in a small town at Washington Irving grade school.

About 1937, I finished a year or two of high school, and my father moved. During those years in Iowa, my father took one trip to Germany,

which was quite unusual in the 'Thirties, to investigate some technical issues at a German company. Germany was prominently a technical leader in metallurgy and steel making, and is even to this day. And he brought back a Voitlander plate camera, and I took it up as a hobby. That's like being given the crown jewels. I was thirteen. It ended up that I built my own enlarger. Using the camera, you could take the back off and use it as its own enlarger. So I built the enlarger case, baffled the light, found the glass and did all this stuff. I built the enlarger. I still have some of the black and white prints I did in those days. Some of my favorite aunt, for example.

My father also brought with him some Dufaycolor color plates, which, at that time, were quite new. These had not come to the market or were just about to come on the market. In fact, you'll see in the National Geographics of that period -- it's the middle 'Thirties -- that some of its first color prints were run from Dufay color separations.

Anyway, I had a ball with these plates. I remember, as a kid, getting one of my precious plates up. My mother was a rose fancier. She grew roses in the backyard. Some bright Spring morning, I took a picture of an American Beauty Rose. And that night -- it took me all night because it's a very complex process -- I processed that plate in the bathroom. I finished processing it and held it up to the light, and there was my mother's American Beauty Rose cluster in color, and that's quite an accomplishment in the mid-'Thirties for a 15 year old kid -- for anybody. At that time, I came up from the bathroom, and my mother was getting ready to cook breakfast, and I remember she said -- I showed her the picture in the light over the kitchen -- "Hurry up and get dressed, you'll be late for school." My mother could be a severe lady. I was not

late for school.

Q But you knew she was pleased?

A Yes. She was woman of few words. Enormously high standards were expected of her and hers. My father in '37 moved East. He left there and started working for Republic Steel, and we lived for one year in Buffalo, New York. I went to South Park High School, and it was a classical school. I remember having to take a whole year of Latin. I wasn't too sure what Latin was about at that time -- what it was for. I've since realized it was a very good basis for any language work subsequently.

I remember we lived in South Buffalo, and on a windy day if the wind was right you could smell all the plants, because Republic Steel's Donner's Works, I think it was called, was located in South Buffalo, as well as the National Analine Company. At this time, there were all kinds of chemical complexes down there. I can still smell that analine when the wind was right.

I do remember one of the things I did at that time, because I knew I was going to head for -- it was assumed I was going to go college. It was the family tradition. My father's father, my father's mother all went to college, even though they were a farming family. So it was assumed we were going to go to college. So I had to start saving money. It was assumed, also, if you were going to go to college, you were going to have to get the money. So I started to work peddling the Buffalo Courier Express -- delivering them. I don't remember what we were paid. I think the paper was three cents, and I got a penny, and I started to accumulate a bank account.

My father and mother were never wealthy -- professional middle

class. They struggled like anybody else. But I remember my brother and I got together, and we raised part of the money and went to the Scout World Jamboree in Washington in 1936. That was quite a thing to do. I remember taking the train. My brother and I, all by ourselves, took the train to Washington and all the way back. That was my second taste of the outside world. The first taste was 1929. I remember that. That was a good year for everybody, and my father packed my mother and us two boys up, and we went to Colorado for a vacation. I remember going to Colorado Springs, driving up Pike's Peak. I was then six years old, but I remember it very clearly.

Anyway, the following year my father went with Republic [Steel] and was transferred to Detroit, which starts really the Michigan phase of my life. I went to Redford High School and finished my senior year there, at which time I also peddled the Detroit Free Press, and I also bagged groceries on Saturdays at a Kroger store. Those were my business activities. I graduated from high school June, 1940. I had a thousand dollars saved, which was a good sum of money in 1940. At the same time, I was approaching the question of where to go to college. It was pretty clear that the best way to get to college for me with my thousand dollars -- and I assumed that my parents would not be able to contribute a great deal. I was to get a scholarship, and I remember I won two of them: one for Cornell at Ithaca and one for Michigan State -- at that time, College in East Lansing, Michigan. I know I won the Michigan State one, and I think I won the Cornell one, but I do remember knowing I couldn't go to Cornell because it was too expensive. The tuition might have been a hundred dollars a semester, but Michigan State was thirty-five dollars a term, and, of course, that was forgiven as long as my grade point was at

a certain level. So I ended up going to Michigan State.

I entered the Engineering School at Olds Hall as a freshman. I'm not sure it's still there. It was interesting how they taught engineering at that time. Since, it's changed drastically. The first year you had to -- I've forgot the German phase -- learn by doing, so I had to take a machine shop course, a wood pattern making course, a sheet metal course, a foundry casting course. I had to go through this whole process all over again of training in shop practice. It was just another addition from what I'd done in high school in Iowa called manual training, so it was a whole continuum. In fact, later on -- that summer or the following -- I went to work as a machinist and later on as a draftsman at the Packard Motorcar Company. To this day, I think an engineer, if he can't make his own draft and make his own parts, is not really an engineer. That's no longer a popular view. Now everyone learns how to run a computer. I'm not too sure they know what an automatic screw machine is any more -- many of the young engineers. I suspect, have never seen one.

Anyway, I went to Redford, finished that year, got to Michigan State, and this would be the Fall of 1940. I can't remember whether I worked that summer. I think it was the following summer I worked at Packard -- the first of several summers -- to get money. And college started. I had decided to take metallurgy without a great deal of thought. It was what my father was. It seemed reasonable. That wasn't a very popular subject. There weren't a lot of metallurgists produced. Today it's called material science. It's got a newer name.

I went to school that year -- 1940 -- and did pretty well. Met a town girl named Margaret Wirth, in due course. I entered my sophomore

year -- 1941 -- and was doing all right. I was in the ROTC. It becomes a part of my story very quickly here. I'm trying to fit everything together, because Pearl Harbor occurred on December 7, 1941. It was a Sunday, as ROTC. Boy, we're off to the races, which we surely were. The following March, we either had been or were about to be called up to active duty, and Margaret W. Wirth and I got married. Now, if you want to know something unusual, it's a married student on campus pre-World War II, or at the beginning. There were no provisions, no nothing. A married student was probably suspect more than anything else.

We're now in 1942, married, and the war has started. In fact, I can't remember which month we were called up, but I do remember my new father-in-law, who is a graduate of The University of Michigan's Engineering School, said, "As my son-in-law, I want you to go to the best." Michigan State was not the best, Michigan was, then, and still is, one of the best engineering schools in the world. "And I will pay you the difference between tuition at State if you go to Michigan." So in the Fall of '42, I went to The University of Michigan as a married student, again. Lived on Tenth Street. It's on the other side of the campus. We had a little rented place up above. Again, married students' rents were kind of steep.

The first child came and was born in the old maternity ward at the School of Medicine. I think it's been torn down. I can remember the building. And I remember it was so unusual to have married students having kids that they decided, as an ad hoc policy, they wouldn't charge me anything except for the medicines.

By this time, I'm called up, and I remember we had to move. The 10th Street address had to be abandoned. We moved out. Peg went back to

live with her folks, and I had to go to East Quadrangle, which was then a barracks. Now it's full time. You're in the Army uniform. But the funny part of it was that, and I can't remember where, the recruiting officer or the admissions officer -- whatever you call him -- screwed up. By this time, I'm a junior at Michigan. The ROTC, freshman/sophomores were nothing, but the juniors got to be cadet non-coms, and the seniors got to be cadet commissioned officers. So I'm a three-striped sergeant cadet, and somebody made a mistake and put us all in the Army as regular sergeants. I never served a day as a buck private; I was a three-striped sergeant going in, which was a break, because I got ninety-two bucks a month as a sergeant -- plus my marriage allowance -- so that Peg and then the one boy, Don Jr., could survive reasonably well while I'm off in the Army.

I finished my junior year in the barracks at East Quad. We were shipped that June to Camp McCoy, Wisconsin, which is just North of here across the border. Went through basic training. The tac officers hated us as a bunch college kids -- all non-coms hated us. Under the regs, we couldn't serve KP or walk guard duty. But they made up for it.

Then that fall the ninety basic training Infantry was introduction. By the way, the teachers were all returning veterans, and we would fill in as training cadre, and, let me tell you, we had serious basic training. It was serious stuff. I can remember seeing the first Gaudalcanal veterans and the troops coming back. And decorated -- I can remember the decorations just all over these guys. It was the real thing. They had been there and survived it.

Late fall we went to officers school, and by virtue of being an engineer, I was shipped off to the Ordnance Department Training School in

Aberdeen, Maryland, which had been, pre-war, the old Ordnance Proving Ground. I'm a college kid and an engineer. Presumably, I'm technically this or that. So we were put into our training. We went through basic -- "Ninety Day Wonder" -- which is another survival course. They just see if they can break you. It's an "Officer and a Gentleman," which was Navy based, but we went through the same thing. They'd see if you'd get through it psychologically and physically. Most of us got through it.

I'm a brand new second lieutenant looking for my first assignment, and I'm sent right back to the proving group in a training cadre, which, at the time, I thought was a disaster, but, as life unfolded, it was one of the luckier breaks because "they" decided, by virtue of my being an engineer, although not finished, and there were only a few of us in that class. Dick Unger was another one. C.V. Thomas. (I haven't thought about those names in years.) We're all sent to be trained to teach successive classes of officers on these new things called radar and computers. So I, as it turned out, had the great good fortune to be exposed to computing machinery in 1943.

Q Mark I's?

A Yes. The M-12, it was a 155 millimeter anti-aircraft gun director. It had a computer. It had the SCR-584 radar set in a big trailer, and we're sent to the Bell Telephone Laboratories at the Battery in Manhattan to go to school. And the people that taught us. There was Shannon on information theory -- later a Noble prize winner -- Nyquist on servo stability. All these masters -- the pioneers -- all taught us young kids at officers school. What a fantastic break! I still have my class notes from that time. There's all the names that became famous after the war as young teachers.

You get through all that, get back to Aberdeen, and spend the rest of the war teaching kids -- I think it was both officers and enlisted men -- all this stuff. I was a teacher! As a result of not having piled up any points -- and I remember it took eighty-five points to get out early, and I didn't have eighty-five points, because all I got was a point for a year of service. I had enough years of service by that time, but in overseas you got an extra point per month. So high point guys got out. I didn't get out of the damned Army until -- it must have been July of '46. Of course, "Due to the fact that you guys don't have enough points, you're going to go to Japan." We went through all that, but we never actually went.

So I get my final pay as I was mustered out at Fort George C. Meade -- C.V. Thomas and I. I bought an old Terraplane of Hudson Motor Car Company origin, and drove that thing from Fort George, C. Meade. I remember we were paid all our discharge allowances. I had a thousand dollars of cash in my pocket. I drove back to Ypsilanti, Michigan, stayed with Peg's aunt and uncle, and I re-entered Michigan in the Fall of '46 as a senior.

Q Was your wife able to join you at Aberdeen?

A Yes. I forgot to mention that, and we had another child -- first Don, Jr. then Judy was born. Of course, she's the resident of Maryland. She was born in the post hospital in Maryland. So the two kids, and I, and Peg got back to Ypsilanti. I'd sent them ahead by train. I just drove the car, because I was trying to get some form of transportation. We entered school in '46/'47. Finished my degree.

Q Where did you live when you came back to Ypsilanti/Ann Arbor?

A We lived in Ypsilanti for awhile. I can't remember the street we

lived on. Then we lived in a bunch of abandoned barracks that the university had taken over for married students -- married veterans.

Q Willow Run?

A Willow Run. In the meantime, I got enough jobs, got enough cash together and could afford to enter graduate school, I'd moved to Pittsfield Village, which was high on the hog in those days. That was good stuff. A great place for kids -- a zillion kids. All of us veterans had families. A completely unique world. Of course, the university professors will tell you that was the finest class of kids they ever had. They knew what they were there for. "All I want is to get an education, get the hell out, and get to work." They all had kids, and I must have been typical.

I remember living in Pittsfield Village, and I think I could find the one. It's still there.

Q Oh, yes. They haven't changed it.

A There was a sidewalk, and across the other side was Paul MacCracken, who later turned out to be the head of the advisory council for what president?

Q Certainly Nixon.

A Was it Nixon?

Q I'm sure it was.

A And, of course, is a columnist today in the Journal, and we see each other once in awhile and reminiscence.

Q He's semi-retired now.

A Yes. He must be five years older than I am. He must be approaching seventy. Anyhow, I got my degree in June of '47 and decided I could scrape enough together and go to graduate school and get a doc-

tor's degree and decided I was going to have an academic career. So I worked three years and got a thesis done. Worked for the, then, Professor James Freeman. He employed me as a research assistant while doing my thesis and doing my course work. The work I did was for the predecessor for NASA called NACA, and it was done on metallurgical research work, as was my thesis, on the high temperature alloys, which was just then being developed to make jet engines for both military and civilian use.

Q Do you remember Maury Sinnott in those days?

A Oh, sure. When I got to be professor, his office was two offices down from mine.

Q He's still there.

A I was going to ask you, where is Maury now?

Q He's still there, as far as I know, although he may be thinking about retirement.

A He's got to be approaching retirement. I think Maury's a little older than Paul. They're about the same age.

Q I think he finally retired not too long ago.

A I remember working in the highway testing laboratory. I remember we got some contract funds from NACA. Some from the Wright Patterson Air Force Base. I remember those. And I'm grinding out, making a living, barely. But you didn't know any better. You had a marvelous time. Along the way, I got to know Jonas Salk and Robley Williams, who was his mentor, because I did my thesis work on the electron microscope. At that time, the university only had one.

So I'm doing my Ph.D. thesis work. Along the way, I paid my fifty bucks and got a master's degree, but that wasn't the issue. And I

managed to get through that thing by. I can't remember, I think my degree was granted in the Winter of '50. I do remember that I got through it in two and a half years, which was forced draft. Like all veterans, all you want to do is get done.

Q What was your thesis topic, again?

A Dislocations -- it's solid state physics, basically. It wasn't even metallurgy at all. It was really basic physics -- solid state physics. Free Energy of Activation of Dislocations.

Q Did you know Henry Gomberg in those days?

A Oh, yes. Henry was a fellow faculty member, as a matter of fact. That Fall, 1950, having been a teaching assistant -- both a paid research staff member of the Engineering Research Institute of those days and also teaching, and that Fall received an appointment as an assistant professor. I thought I was riding high.

Q You were, in a sense.

A I was twenty-seven years old.

Q You'd opted for a life in academia?

A Yes. As a young assistant professor at the university in the College of Engineering. In those days, the chem and met departments were combined, and it was called the Department of Chem and Met -- chemical and metallurical engineering. I was an assistant professor in the department. The chairman was George Grainger Brown, who later became dean of engineering. In fact, I remember, as probably the youngest member of the senate faculty senate, voting on all this. That was a big experience.

I'm ensconced at a good university with a good appointment. I remember my first year's salary for nine months was $3640. I still have

a payroll stub. I was looking within the last ten years and chuckling over it. If you taught summer school, you got another $800. I did not teach summer school. That's part of the story. 1951, comes the summer, I'd finished my first year of teaching in mostly graduate courses. I decided to take the summer off, and the Babcock & Wilcox company -- the boilermaker -- later nuclear plant maker -- were on campus, and they were offering to young professors a summer job for the industrial experience. So I thought that was want I wanted to do, so I went to work for the summer at the Babcock & Wilcox Company in Beaver Falls, Pennsylvania. At that time -- as far as I know, they still do, although they're owned by somebody else now --they had their own steel mills making very special, high alloy, specialty steels -- very high grade stuff -- much of which was made in the form of stainless tubing for boilers, including high-pressure boilers and the nuclear boilers. So it was a very sophisticated steel mill, and being a metallurgist and teaching, that fitted in.

So I went to work for the B&W Company for the Summer of 1951 in Beaver Falls, Pennsylvania. Before that summer started, I had enough bucks, and I bought my first new car. I remember it was a black Ford.

While there, two things happened. First of all, B&W said, "We'd like to hire you full time and be head of our metallurgical laboratories." "No, no. I'm going back to the university, I've got...." Then a friend of one of my thesis professors, Lars Thomason -- now dead -- Don McCutcheon called. Lars Thomason was one of my faculty thesis committee members and the X-ray crystallographer expert of the faculty. That's how I got into the the field was through the influence of Lars Thomason and doing X-ray diffraction work, which is a then method of determining crystal structure -- crystallography. He had this friend

McCutcheon who was working for the Ford Motor Company, and McCutcheon, apparently, came out to see him one day and said, "The Ford Motor Company is going to organize a research laboratory, and we're looking for bright people," and Lars gave him my name.

So I'm in Beaver Falls, and I get this call, and I said, "No, I'm going back to the University of Michigan. I've got an academic career well started. I'm in the right place, right everything." I don't remember all the details any more, but I got a call back.

Q You'd gotten a call from Ford?

A Yes. Finally, I was coming back to Ann Arbor, anyway, so I said, "I'll stop by and see you." I first met Andrew Kucher at that time. This might have been late August, and it's 1951. It turned out, he was a great friend of Ernie Breech's, who was already the legendary head of the company, and its finest head, in my view. Nobody ever touched him since.

So he gives me this pitch, and they're going to build this scientific research laboratory, and they want to have a metallurgy department and do research, etc. I said, "No. It's fascinating, I'm flattered to be invited, etc., but, no." So I went back to Beaver Falls to finish out my summer. I probably had two or three weeks of work left to do. I remember I was doing a research project for them, by that time, and I remember I published that thing somewhere. Somewhere in the archives of something is my Beaver Falls research project on steels for steam power plants.

I get another call, and would I like to have lunch with Ernest Breech. What the hell, I think this is on my way back to Ann Arbor permanently.

Q Was this Andrew Kucher calling?

A Kucher called me and said -- well, sure it was him. I knew from my father, at least, who Ernie Breech was. My father had ended up at Detroit Republic Steel in the automobile industry. He knew them all. I remember going to the then Rotunda, which has since burned down, and its palatial dining room, it's got a 1936 late art deco, and having lunch with Ernie Breech.

So he gives me the pitch, and I said, "No. I'm delighted." I really, frankly, was taking advantage of it. "I wanted the pleasure of meeting you. I know who you are. You're legendary, etc." He said, "What will it take to bring you here?" The only thing I could think of, I laid the biggest salary number I could think in my head -- in my then young mind -- which was $10,000 a year. He said, "You've got it." At that point, that was it -- $10,000 a year! I remember thinking, $833.33 a month plus a penny. Wow!

So I went back home, and I remember going to see George Grainger Brown, who at that time was dean. I thought I owed him that. I went to see him, and he said, "I'm not surprised. It was just a matter of time before somebody picked you off." So that started my industrial career.

We built the lab. They were true to their word. We had money. Money was no object. Breech wanted to get a research laboratory going. The company had no engineering traditions at that point, in the professional sense, let alone any research traditions. So the whole thing was up for grabs. Talk about right place, right time. That was the place. The company was emerging well, and Breech was running it well, and they're putting profits back in the thing, and they wanted to build out in the, what is now the Research Park near the center of the company, out on the edge of Dearborn.

I remember I went to work in the old Henry Ford Trade School for a brief period of time while we were building the first of our laboratory buildings. Money. Oof! Wanted to build a metallurgical research laboratory, I said, "You'll have to have this, this, this, and this." They said, "Fine." And we ordered this, this, and this. It was just like building the pyramids.

Q Can you tell us a little bit about Andy Kucher? He's kind of a legendary figure, also.

A Yes. Andy was a self-made inventor type -- an original one-of-a-kind. He and Breech ran into each other years and years earlier, and it had something to do with Bendix. Andy had done something of very seminal note with Bendix, like a starter system. Breech fastened on him early, and whenever Breech went -- Breech had gone a number of places -- General Motors, Bendix, etc.... Kucher was either there, or about to be there, or had just left. They were intertwined. They'd intertwined themselves for decades. So when it came time to create a research function within the company, why, Breech said, "It's Kucher," wherever he was at that time, and in Kucher comes.

Kucher, first of all, had great presence. He was a tall, good-looking man -- 6'5" -- very articulate. His engineering science had holes in it, but the lay audience didn't know that. If you were professionally trained, like I was, you'd pick out the holes. That didn't make any difference. I mean, he sold the board of directors on the next twenty million dollars with eighteen buzz words. But, behind that, was a real craftsman.

Q A visionary?

A Yes. And he was going to do this and do that, much of which we did do. What else could I tell you about him? He had a wife, Marge -- equally statuesque. A very imposing woman -- striking. I haven't thought of her in years. They built a very fine home not too far from me. We used to go over there for dinners and so forth. It was a small-knit group in its early days -- a dozen people building this lab. Then, of course, it expanded enormously and hired some famous names: Michael Ference, a physicist from the University of Chicago; later on, Jack Goldman, from Carnegie Mellon, who became, ultimately, the chief technical officer of Xerox; on and on.

Q That's a great group?

A A great group. We entered the inner circle of research institutions quite early, and they're still there. We never were the scale or scope of General Motors research labs, but it was comparable in quality, if not a little bit better, as a matter of fact.

Q Is Mike Ference still there?

A No, he retired not too long after I left the company, and I'm not quite sure why. He left in the early 'Seventies. I think he lives down in the South -- the Carolinas or somewhere. I ran across his track recently, and I can't quite remember.

Very quickly I became known as the pragmatist in the outfit. And while I had all the credentials, I really was never very long hair, and I kept looking around to see what we could do to make a buck quickly to get the laboratory economically based. Mike Ference was much more interested in basic science. I never was, both by inclination, and metallurgy is a more pragmatic thing. While I did my thesis work on some pretty esoteric stuff, that really wasn't my long suit as I look back on it.

I got quickly involved. I remember one summer going up to Ishpeming, Michigan. Up in that region, the company, at that time, had a joint venture with the Cleveland Cliffs Iron Ore Company. We built a beneficiation plant up there, which meant you refined the ore on-site, and then shipped the high-grade stuff South into the Rouge. I got involved in that project with a guy named Louie Erck. I remember going up there only in the summers. Getting into the place, because the snow was ten feet deep by November, was only in the summers. Got into some cutting tool work.

In about 1955, the company decided to split the then research lab into two pieces: the basic research function, and engineering research, which was the applied side. Mike Ference became head of the Scientific Lab, which kept that name as basic research, and I became head of Engineering Research. Now we got a little closer into future automatic transmissions, signaling systems, brakes, etc. It was heavily engineering-oriented.

Q Del Harder had got the company started in automation and things of that sort?

A Yes. But we had a little to do with the manufacturing side. Most of it was product related. The big project in 1955 was a whole bunch of exotic engines, and as head of the lab, I got the first gas turbine built in the company. We designed a little gas turbine about so big, so high, and had about a hundred horsepower. I still have pictures of it somewhere, and we got the damned thing to run. We built a free piston engine, which is another form of very high super-charged form of dynamically-free pistons which, in turn, drove a turbine to power output. Got that built and running for a tractor. That damned near went into

production. The first time I ever saw McNamara was on that project. And a guy named Bugas. He then had the tractor division, and he liked that concept from the beginning. To this day, they should have done it.

Q How come it didn't go?

A It was a big investment. I don't know all the facts. Remember, I'm just the engineer in the back row with this thing that worked, and I go to this big meeting. First time I've been in a heavy-breather room. There's John Bugas, Red Duffy was there, and McNamara, Henry Ford was there, and I'm there to testify, so to speak, about the thing, and Bugas wanted to build the plant -- wanted to make a production engineering project out of it and make free-piston tractors. They should have done it. But as I recall it, and this is very dim, it is 1956, maybe, and they weren't making any money. So McNamara was clearly -- even then, in those days, as naive as I was -- was clearly lying in woods/weeds for Bugas, and he cut him up. "What's the return on investment going to be? What's the internal rate of cash return? What's the discounted cash flow, etc.?" And Bugas didn't know any of it, so the project was tabled, and killed which was a mistake.

I learned something in that meeting. I remember thinking about it. I didn't know a lot, but I knew a couple things. First of all, that project was right. Technically we'd done enough economic studies -- but if you don't have your facts, the sharpshooters can kill you. I think about that time in my life, I made up my mind that if I ever got to that room as a player -- serious player -- I'd have to take those guys on in their terms -- I'm talking about the financial types. I think it was about that time I realized that. I also think I realized that, hell, I built the thing -- created the project -- got the thing done. It might

have started a whole industry, but I'm way below the salt. Those guys up at the head of the table -- above the salt --they're making all the decisions, but I did all the work. That was a naive, provincial kind of view, but I decided I'm going to get above the salt. I think it was that kind of circumstance when I said, "I'm going to get above the salt."

Well, I had a break. A professional one -- careerwise. I didn't know it at the time, but that those turbines that I designed became the basis many years later -- 1965 -- of a citation for election to the National Academy. That's the Oscar of engineers -- The Academy.

Q What happened to the free piston?

A Died.

Q Still a viable principle?

A Sure.

Q They never picked it up?

A No, and it probably won't be in my lifetime, because, in the first place, the farm equipment industry is in the pits, anyway. I don't think anybody is making any serious investments in new technology. Nobody can afford it any more.

Q But this offered you a major recognition at a certain level?

A Yes, it did. And more than I realized at the time. In fact, a great deal more, because, in the Fall of '57, I'm called into Kucher's office, who had both the engineering and research function and the basic research lab, and said, "You have new job on Monday." This is a Friday. Everything always happens on Fridays in my life. "What's that?" I asked. He said, "You're now executive engineer in charge of the Ford and Mercury car lines." I said, "What? I don't know anything about designing a car. I never designed a car in my life." He says, "Well, that may be an

advantage."

I think my second question was, "Do I have a choice?" "No." To which I said, "Can you tell me where I go Monday." "Well, you go to building so and so." I then had an office a fourth the size of my palatial office as head of engineering research. I remember feeling put upon for about one hour on Monday. Now what had happened -- I didn't know any of this -- was that the '57 Ford was a roaring success as a styled new product, but it was a disaster technically. It was a horror. The warranty costs, the failures, the body frame that was so badly designed that you could go over a certain railroad track at a certain frequency and knock the doors open. They knew they were in big trouble, and they'd better put some professional new blood in there. And somehow, after all this stuff with engines, etc., Breech said, well, I'm it. I'm sent over there. I didn't know a goddamned thing about it.

I remember looking at this bare, austere, Hauserman grey steel walled office with no rug -- nothing -- and feeling sorry for one hour, and then the deluge hits, and I never looked up for the next ten years! I remember in the first weeks: prototypes -- where are we? -- what's the schedule? (I didn't know anything about schedules.) The development cycle? I remember asking an innocent question, "Well, how many prototypes...?" At this time, we're just finishing the '58 Ford, which was, hopefully, a fixed-up '57, and the '59 was in tooling. You quickly learned the cycles. I remember trying to find out where were the '58 prototypes were. They had nothing to tell me. There was no organization. It was chaos.

The then chief engineer was named Hans Mathias. I don't know to this day, but Hans or his predecessor had lost control. But he kept his

job, and I'm his new boy. I didn't know a goddamned thing, but, at least, I was somebody to help. I remember years later Hans said to me -- and we had things roughly put together and had some semblance of order and started a long process to start to make good automobiles in the full sense, which culminated in the '65 Ford many cycles later -- with his marvelous German accent -- "I do not understand. You take the same old questionable people, and you get a team with the same old people. But, you do." I said, "It's probably fear."

Q How did you bring order out of chaos?

A You have to think orderly, first of all. Okay, what's the schedule? Job one is this date, and we've got to have work back in time. We have to get this done by that date to make schedules, and you check upon that once a week. Did the prototypes go to Kingman [Arizona]? -- that's the proving ground -- did they pass that test? and you put it in writing. Did they pass or they didn't, or if there's a failure, what's the date to fix that? So you start to structure the system. Now that's bean counting. That's bureaucracy. That's paper. That's reports. Tons of everything. That's a part of it. The other part of it is to be damned interested in people and what they do. You don't sit behind a desk. I learned long afterwards that there's a name for what I learned to do in those years -- and, perhaps, before that in research -- it has an acronym -- MBWA. It's in one of the books -- one of these potboilers, like "In Search of Excellence" in all those business books that made a lot of money for their authors anyway, "Managing by Walking Around." I always did that. I never sat at my desk. I can't stand sitting at my desk anyway very long. I try to get my paperwork done quickly so I can get off.

So it's a combination of rigid discipline on one side, because you're in a very rigid, demanding situation. You'd better be ready on August 11 for the first pilot run in the Kansas City plant with that model, or you're going to get yourself fired. And, furthermore, it better be developed to work right so the warranty cost doesn't kill you, because you're going to get hauled before the mast over that anyway -- six months later out there in the field. That's one side of it. The other side of it is you're just plain interested in the people, "How are you doing? What are you doing?" And you constantly work through it, and make everybody legitimately feel that they're an important part because you're interested in what they do. The thing gets in your blood real quickly. It still is.

Q At that time, what was the situation, vis-a-vis design, marketing, and product planning?

A The company was a typically Ford cockamamie organization. (I think it's better now.) A goddamned awful organization. But it turned out to be a lucky break because it was great management training. I'll explain that. It was horrible, but a great training ground.

As it turned out, preceding my days, it was probably the product of a McKinsey or a Booz-Allen study, plus the Whiz Kids' ideas of what industry was all about, from that Harvard think tank and statistical analysis group they ran in World War II. That's where they all came from. Charlie Bosworth, Ben Mills, Tex Thornton, Robert McNamara. Who am I missing? A couple more. Jack Reith.

Q Was Jim Wright there?

A Jim Wright, yes. Those suckers took the car business, and they chopped it up into profit centers within itself. It's about like taking

that radio there and making the division that makes the buttons -- that's a profit center. The division that makes the speaker, that's a different profit center -- a different management, all which report to the top. But they forgot who's in charge of the device. Well, they put somebody in charge of the device all right with no authority, which was the Ford Division's engineering offices where I was -- where Hans was chief engineer. I started out as executive engineer it was called. There were two or three execs -- one for trucks, one for Ford and Mercury, and one for Lincoln -- the big Lincoln. There were three of us. And we were to glue it all together, but we had no authority, so you had to do it with force of character and personality, because the transmission was part of Transmission Division. Chassis parts, which we designed the chassis, were made by another division. Ford Division had no manufacturing. They had the assembly plants at that time, but none of the fabbing operations, where the engineering and tooling of the parts was done, so all of the divisions that made the parts had their own engineering office, but the Ford Division engineering office was supposed to get everything together in one box, bolt it together, and see if it was an automobile. And, of course, the '57 Ford was the perfect example of what you'd expect to get out of the system. Nothing worked. It was a collection of parts but not a car.

So I realized, after a year or so, I've got the problem but no solution, except I learned the method of making people part of a team. I had to extend it through all kinds of divisions over the years to come -- throughout the entire company -- with no final authority. None. If they didn't like the fact that I miscued myself, if I didn't like their transmission, and I squeezed too hard, too quickly, and I said, "I don't

want that transmission. It's failing. It's your design and your tooling, etc.," they could go all the way up as high as Henry Ford for separate approvals and tell me to go bag my ass because I was interfering with their profit center. Now, those are all phony profits. The only profit of money is when you sold the car. The fact that we divided it all up and said, "For you, the transmission." That's bookkeeping. That's not market profit. You understand my point?

Q Was that McNamara's idea?

A Sure, and I grew up with that goddamned thing! I get mad about it yet. The agony! Now, what did I get out of it? I was the only guy in the final analysis over the long years until I left, who kept the product glued together. That's not an ego statement. And I finally got enough credibility that pretty soon they didn't want to take me on, because I would win a few. It's being very basic about this. You start to build a reputation. "Well, Frey says it isn't any good, and I know the boss says our costs are out of line, but he said we'll be able to fix it." You slowly built that up. I learned a lot. I learned out not to over-organize things. But you learn how to get things done.

Q You had an ally in Gene Bordinat at this point?

A Yes. Gene and I had a love/hate relationship. It was fascinating. He was always scared to death I'd take credit for what he was styling, and he always wanted the word design. I said, "Design is what engineers do, you're stylists." But he also knew I got the job done. So, at least, we respected each other. And, of course, when the Mustang came along, it was a big fight who took credit for what. Of course, Iacocca walked off with it. He had very little to do with it. You know that story.

Q Let's talk about it a bit later. I'd love to hear your viewpoint on that.

A So you build up a reputation. It's highly personalized. The company never was bureaucratized in the sense of the General Motors faceless machine. It was all a bunch of personalities, and I became one of them. But I was always the guy that got the product stuff done. I remember -- this must have been the '58 Ford -- not worrying about how you build a reputation. At the time, you're not building a reputation, you're surviving. Young kids now get screwed up. They're worried about the next job. I said, "No, no. Get the job done you've got now, and the next one will take care of itself."

I remember Don Bastien, who was at that time head of the assembly system. The guy that's now head of International Harvester, Don Lennox, was his pilot manager. I remember Don at the old Pilot Plant in Dearborn, which is now the service center. Pilot Plant was a process of theirs. Built the Pilot Plant so we can get stuff shook down before we launched it in the plants and built junk for thirty days. I think of those days. Horror! You get this stuff launched, then build the quality, and so forth.

Don called up one day madder than hell. He said, "You get your ass down here" -- and I went to Dearborn Assembly Plant -- "and you try to put that window assembly together." I looked at it. I said, "Nobody can put that together." He said, "I've been telling the goddamned engineers." So I got mad, because you couldn't put the thing together in the line. You had to make the line right so the window would go up nicely.

Henry Grebe, I think his name was at the time, ran body engi-

neering, and I got ahold of Henry, and I was mad. By this time, I had just enough reputation to get away with something. I said, "You come with me," and we went into this huge drafting room to find this guy. I said, "Do you know you can't put that thing together on the line?" "Huh," he said, blinking in the light. I said, "Have you ever been down on the line, sir?" "No." I said, "You come with me." We took him down. He'd never been on the line before. The story ricocheted all over the company. I took this draftsmen by the scruff of the neck, so to speak, with Henry trailing along, and we put him down on the line. I said, "Now you try to put the thing." Bastien is sitting there starting to realize something was going to happen. I said, "You get your ass back, and a week later you get the tools modified, and get the samples in there, and we'll try it on the line." Don, to this day -- he's now dead -- never stopped telling the story. "Before I got done, he got the fucking thing fixed. I never saw anything like it in my life." That's how I started to make my way. And we got the window fixed.

And, of course, in those days, the Ford Motor Company windows rolled hard. They were awful. And there was a fundamental design problem. It was not capable of being assembled accurately in the crude conditions on the line. This basic design consideration is in any engineered product.

I can't use the word "cleaned up" the '57 Ford. It was too late. In fact, it went out of production a month after I got there, and I did little with the carryover '58. Got a passable '59 Ford done. '60 was retrogressive, but about that time -- along the way -- I got my second break as McNamara had done the McNamarian car that was clearly identified with him was the '58 four-passenger Thunderbird. There had been a two-

passenger Thunderbird.

Q That was his concept.

A The '58 was McNamara's. I learned later, which is not very important, but I never could figure out how he got involved in a Thunderbird, which is not the ultimate rational buyer's car. That's a different story. I found that story out years later. It had to do with a college professor who was a great marketeer at Harvard who taught segmentation.

Q Mathias is with you all the way?

A Yes. And I got to be assistant chief engineer. It made me feel good, but it didn't mean anything -- same job. Moved up a notch. I think I got paid some more.

Anyway, so I did the '58 Thunderbird. That was a roaring success, and that, really, was the first car -- caught it a year early -- for which I had some sense of its participation, and I liked that.

We built the Wixom plant that year. I liked that, too -- a new assembly plant.

Q Still going strong.

A Yup. Now, McNamara goes to Washington. I know that was early 1960. Jim Wright had the Ford Division -- a disaster.

Q Why was Jim Wright chosen?

A Why did he what?

Q Why was he chosen to head the Ford Division?

A Damned if I know.

Q Who did choose him?

A I don't even know who chose him. I knew nothing about the higher level of decision-making. All I know is it was a bloody disaster. And McNamara was made group V.P. Excuse me, this is 1959, when McNamara

moved up to group. Wright took the Division, and it was a bloody disaster. And McNamara knew it, and just before he went to Washington, as I remember, he removed Wright. No, Wright stayed on after he left, but it is still a disaster. About that time, I was promoting something, and I was in Wright's office. That's right, he was still there, and I'd had this concept, which was really my first original, serious design -- big time design -- concept of my own which was to get rid of all the lubrication fittings on the cars to make it easier to service them. I'm in Wright's office pitching the program to get some money. approval of some tooling, etc., and Wright was struggling. He didn't get it. He really didn't get it. But, fortunately, this guy came in -- I can't remember if he was there before -- named Iacocca. Just in from the field. It took Iacocca three seconds to figure it out. He said, "My God, lifetime lubrication." He was great for marketing concepts. He was then marketing manager, and that's where we first met.

Q Had Charlie Beacham brought him in?

A I think Charlie Beacham brought him in originally from the Philadelphia office where Charlie was at one time and where Iacocca met his wife, Mary. She was a receptionist at the Ford office outside of Philadelphia. He was finally made division head, and this must have been '61 or '62 now. Wright had been removed. We did the lubrication stuff into production -- I did -- at least in its early stages.

Q What was it called?

A We called it "Lube for Life." We just took off the lube fittings on the chassis. Sealed-for-life bearings. As far as I know, I think that was the first time it had been done seriously in the industry.

Wright is removed, Iacocca takes his place, and the next thing I

know, I'm called down to meet Iacocca in Philadelphia. It was at a Rittenhouse Square hotel there. I go up to his room, and he says, "I want you to be product planning manager of the division." Oh, I forgot. The year before that, I had my first taste of Henry Ford. He called me over. I was then assistant chief engineer of the division, and he wanted me to become chief body engineer to replace Henry Grebe who was retiring, and I turned him down. I said, "Will I have a choice?" "No, I don't think so." I said, "Well, I really don't want it." "Why? That's a big job. It's the highest paying engineering job. Big bucks." "No," I said, "I really think I'd like to take the chance. If it ever comes my way, I'd rather move into general management. I really don't want to continue my career, necessarily, as a professional engineer."

Q You'd developed a taste management and administration by this time?

A I'd saw that free-piston turbine thing and other things. So Iacocca said, "You want to go into management, and this is the way to do it." I said, "I guess the bell has rung, so I guess I'm your product planning manager." About a year later, and that's when the Falcon convertible was done. McNamara didn't bother me about it. He probably didn't know I was involved but was mad about it.

Q Had you any input into the Falcon problem?

A Minimal. It was not mine. It was a special team. I was doing the Ford/Mercury, the then big cars -- the mainline cars. No, at that time, I had nothing to do with it. Product planning lasted about two years. I don't remember if I ever knew what motivated Lee, but, anyway, he reorganized the division into two pieces: sales and marketing and then all the hard hat stuff -- engineering, tooling, manufacturing, what little of the

assembly plant was left. I was made assistant general manager, and the most remarkable thing was that my previous boss, Hans Mathias, and I reversed. I became his boss. Typical automobile. Typical Detroit.

Q About four years later?

A Yes. I remember Hans coming over the day it was announced, and he stuck his head in and says, "Hi, boss. It's going to work just fine," and it did. It didn't bother him, didn't bother me.

Q In '61 you're product planning manager?

A Yes.

Q You've got a couple of tasks ahead of you?

A Yes. Not the least of which, and I remember Lee saying, "Get us, goddamnit, back in the automobile business. I'm tired of Falcons, Fairlanes, plain Janes. It's youth, it's pizazz, it's everything."

Q The McNamara austerity program was over?

A It was over. Iacocca said, "Let's get back in the goddamned automobile business." That's exactly the way he said it. It was pretty clear that we had a lot of work to do. So two things were apparent at that time. They were two quite different things -- well, three; we were slipping. We used to curse that Falcon. He said, "Put a rag top on that damned thing, and it's still a Falcon!" It was a stopgap. It was a horrible automobile. I remember, at that time, as product planning manager -- not as engineer -- we practically had to put armor plate under it to hold together, because there was no structure at the top.

Now I'm assistant general manager. The '61 is still in the market. Let's see, what did we do? We did something. I think the big thing that year was to get the next generation Thunderbird done, because it was already doing well. One of our few decent entries. We also knew we had

to get some youthful characteristics in the product line. We also knew we were going to have to do a new Ford because the business was still won and lost between the Ford and Chevy, and we were slipping badly. The car was obsolete as a design. And remember -- I'm trying to think if there was a chassis between -- but I think that was when I was product planning manager in '61, we were still running on that '57 chassis, modified somewhat for the '60 car line. It was obsolete. The whole thing was obsolete. So we started that year the beginnings of what became, ultimately, the '65 Ford, which was new from stem to gudgeon. It was the first fully competitive, full-size car we produced in the company since '49 against the Chevrolet.

And we also knew how to get youth into the product line. While I was product planning manager, we had to get with the youth image, and we were looking at Polk data, and I think it might have been with Don Petersen or Hal Sperlich. I don't remember. They were both junior cubs in the product planning office.

Q You had sort of an ad hoc committee that met quite frequently. No, not the Fairlane group, but your own product planning group?

A Yeah, we'd meet together and ask what the hell we'd do in the industry. We were looking at Polk Brothers data, and it would have been with either Petersen, who was a middle linebacker, or Sperlich, who was a brand new kid at that time. He might have come in and said, "Look at this." And what it was was the registration data for X number of months of a little car called the Monza. Now Chevrolet, at that time, had in production -- 1960? -- a little car which Nader made famous called the Corvair. It was a dog.

Q It just didn't go?

A No. It was a dog as a concept, and it was a dog as product. As a matter of fact, Nader was more right than wrong about the damned thing. It was pretty dangerous under some conditions. Anyway, in desperation, General Motors took the thing and put four bucket seats and a console in it -- it was the first time it had been done -- and called it the Monza, and damned if it didn't sell.

Q The Monza was...?

A The original Monza was a bucket seat derivative of the Corvair.

Q I mean, the derivation of the name?

A It's an Italian racing track.

Q As you say, a little pizazz?

A Yes. In later years, we raced at the track at Monza. It's in Northern Italy, not too far from Milan. Anyway, the Monza sold. They sold 75,000 units, as I remember the number, for the year. "Look at that. Sports car. Bucket seats." And we started to roll on the concept. We went over to styling and got ahold of Gene [Bordinat], but we didn't have any money. We knew we weren't about to get very much, because, remember, the company had just finished running off the last of the Edsel, so while we were screaming up and down about getting some youth in the line, the higher authorities weren't exactly taking fliers on anything. And we all knew that. At that time, I was aware of the basic workings of the problem, particularly as product planning manager, because you always met the brass to present programs.

So we sat down, and our first thought was to find out where the original two-seater Thunderbird tools were. And damned if they weren't still in storage at the Budd Company. So I remember going to see, I think it was Gene, and said, "Why don't you take a model off the '55 or

'54 two-seater if we can still find the tools and see if you can modernize it and see if we can put it on the road at an el cheapo cost as a little sports car. Well, somewhere I think I've still got pictures of those things, it looked like just what it was, a reworked '55 car. Nothing. Well, that wasn't going to work. So now, I think, I'm assistant general manager. Had a little more authority.

Q Why wasn't it going to work?

A It didn't look like anything. It looked like what it was, a reworked 1955 car. Terrible. So I'm sure I went back to styling and said, "All right, let's start with a clean sheet of paper," and we started out on a two-seater. That didn't get anywhere.

Q You mean nobody bought it?

A No, no. It's just that styling didn't click. And we used to tell styling. I used to say, "Now, look, there's one thing this car has got to be, it's got to be instantly recognizable on the road as different," because we're also entering an era in which all cars started to look alike -- a disease that comes into the industry from time to time. Right now, G.M.'s got it terrible -- all their cars look alike. It's not new. Every twenty years they go through the same thing, and they have to change the stylists and start over.

So they all looked alike, and I said, "It's got to look instantly different, Gene." And they didn't look instantly different -- model after model after model. My timing isn't quite right, because I remember Lee had just been promoted, and we were still struggling with this thing, but I do remember the following issues. I know I've got them timed right. One day a stylist named Joe Oros -- who I think is now dead.

Q No, he's still alive.

A Is he still alive?

Q Yes. Lives in Santa Barbara.

A Joe and Gene didn't get along always.

Q Joe was difficult?

A Very difficult. And it was through some difficult days Gene had sentenced Joe to Siberia and put him in charge of trucks. That was always Siberia.

Q That was the styling Siberia in those days?

A Oh, yes. Still is. I don't think it's exactly the place to be now, for the seniors, anyway -- just junior trainee guys. But Joe was not junior; he was senior. And Joe's listening to all of this. So one day Joe stopped me, and he said, "I'd like to show you your code name." We called it Falcon X. I think that's right. He takes me in the back of the truck studio, and there's the Mustang.

Q Who had he got to do this?

A Joe and his little crew.

Q Who was on the crew?

A Don't remember any more. I remember Joe.

Q Dave Ash or...?

A Dave Ash was there. He had a peripheral role. I can remember names if you'll tell them, but he was not main stylist.

Q Gale Halderman?

A Halderman was -- in fact, I think Halderman might have been the most -- the guy that moved most of the clay. Dave Ash was more the interior. Halderman was the quieter one; Dave Ash was the flashier. I can remember them. But it was Joe's baby. I said, "My God. How did you do it?" He said, "Well, us guys heard what you were talking about, and

they got together and worked Saturdays and Sundays." I thought Gene was going to shit bricks, but he had to admit....

Q He had his own team working on it?

A Oh, sure. Joe's truck guys came up with a car working on their own time. So about this time -- now I'm not sure if I've got one fact in front of the other. Somewhere along this time, I thought I'd better bring Lee [Iacocca] over -- bring him into this act.

Q You were, obviously, impressed?

A Yes. And I can't remember if it was just before this or just after this, I brought Lee up to date, because he'd heard nothing about this. This was just a bunch of us kids over in the corner with some bootleg money out of styling and screwing around. We had no authority for anything, except Lee's charge.

Q Joe was anxious to get back?

A Oh, yeah. This was his way back, which surely got him back, at least for awhile. They fell in and out of favor with each other over and over again.

I think what I'm going to tell you was before this, because it was still a two seater, and I brought Lee over, and Lee made a contribution at that point, which was.... Then before Joe Oros' model, because I remember Lee saying, "You'd better make it a four seater."

Q So you must have shown him the two seater?

A I showed him a two seater, so it must have been earlier, by the very nature it was a two seater, and he said, "It'd better a four seater." I said, "Yeah, I guess, you're right." He says, "You'll never get any volume on a two seater." The original Thunderbird never did have any volume. Lee made that contribution.

Now there's a lot of controversy surrounding who did what to whom. Most of it's nonsense. The plain fact is that the original concept was not his, the styling was not his, the design execution of the car was not his, with the exception of that. He observed on the two-seater/four-seater thing. Lee probably promptly turned on and decided to put four seats in it.

Q Which you said was vital?

A Vital. Once he saw what we had, then he turned that marketing mind of his to work and realized he had a winner, and then he took the job -- primarily -- I had only a secondary role -- in getting the thing sold top-side.

Q How did he do that?

A Sheer persistence. I think we -- I say "we," I was involved in a few cases, and, as a matter of fact, that happened by dumb luck -- I happened to be there when the final decision was made, but I'll tell you that story in a minute. Just persistence. Just wore them down.

Q Can you give us a capsule case history of how a product is approved? To a get a product approved at this level?

A You first of all have to somehow get past the finance staff in the staff role, and before the main body of the approval committee, with a program that makes sense financially.

Q Who was that? Ed Lundy?

A Ed Lundy was there, and I'll tell you a story about that in a minute, because I did have a role in that, and that's a funny role. It's a funny story. I don't think it has been told before what happened there. But to get back, the backdrop was the Edsel. That didn't help any. The company was not at the highest levels in an experimental mood,

but we were losing share, and the youth boom was hitting -- the postwar boom was really hitting by then. We're now talking the early 'Sixties. We had to do something, and a convertible Falcon wasn't going to do it. In fact, I think we did a convertible Fairlane which was hardly any better. So he just wore 'em down.

But, I'll tell you a couple of side issues. I remember one day I was in the styling studio, we were still in the final throes of trying to get the Mustang approved, and Lee had picked on the idea that he wanted to introduce it in the '64 World's Fair. And the World's Fair opened -- I'll never forget -- April 17, 1964, so we had to be in production by then. Trying to get the schedules worked out, and we had to get the tooling approved, the designs finished, and the durability tests and so forth. The time's getting late, and finally I'm over in the styling studio doing something, and in comes Henry Ford. He sees me standing there, and he says -- it was about verbatim, something like "That fuckin' Mustang. I'm tired of hearing about it. You guys got to sell the son of bitch. It's your ass if it doesn't. I just want to get rid of you guys." And I realized what he was saying was that he was going to approve it. Now, he had the committee meeting, but I happened to be there early by virtue of having been in the studio that morning. He just took it out on me.

And that's how it really got approved. Lee just wore 'em out. As I said, my role was only a peripheral man. However, I can't remember which of the many meetings we went to where I presented the program as a program. By this time, we had some legitimate money. The financial question was what's the break-even line, and what's the incremental line?

Q The old McNamara technique?

A Yes. Well, the break-even line was easy to calculate. It was about 83,500 units. I remember the number. Then the question was what's the incremental line? Well, who in the hell knows? It's typical corporate finance staff bullshit. To this day, I say to Ed Lundy -- by the way, Ed and I remain good friends -- "Ed, you're not stuck, you know." I still kid him about that.

George Brown was then head of market research at the corporate level, and later became head of the census bureau. He and I were good friends -- both Ann Arborites. George used to bitch about the system. Of course, George says, "Why are you screwing around with the incremental numbers for?" or words like that. I said, "I've got to get this done." He said, "If they just let you alone to design the car. You're good at it. We need an automobile. We need good stuff in the marketplace. They give you all this crap to do." I said, "I've got to get the question answered." So they ask me in the big meeting -- they asked what is the incremental volume? I didn't know what to say. I can't remember who it was. Lundy, say. Or was it Arjay Miller at that time? He said, "George, you find out the incremental volume." George -- who the hell knows? In the first place, they didn't even know after what it was -- says, "Yes, sir." I get back to the office, and the phone rings -- George. George said, "Don, what's the break-even volume in that car." I said, "It's 83,000 something." He said, "Okay." We go to the next meeting. We'd done all these magic spread sheet studies. It's all bullshit. He declares that the incremental volume will be 86,500 cars, and just as he's saying it, I'm looking at him, and I swear he winks. The son of bitch had just took my number and moved it around. And then

he called me back again after the meeting was over and said, "I like your car. Now, get your car made." "Okay." That's how we worked that one out. I still laugh about that. So much for all that crap.

Q There hadn't been too many marketing studies?

A I'm coming to that. Mind you, we had to wait for Joe Oros' model.

Q You got approval. You've got a model, and that's it?

A I think that there was probably another finance test. They said, "Where's your market research data?" We didn't have any. So Lee says, "We've got to get some market research data." Now this is his second act. He said, "I'll tell you what you do, Don." He said, "You know, we've got to get market research data on this thing." I said, "Yeah." He said, "I'll tell you what you do. You get the twelve best automotive writers in the country and show them the car." By this time, we had a couple running. And we knew we had at least a good car at that point. People asked, "Did you know ahead of time?" No, we didn't know ahead of time. It was one more car line with a little more excitement, up to a point. Then we knew we had something special. Remember, we'd done two-thirds of the work before the prototypes were on the track.

I remember the first day we rolled the prototypes on the track. I knew we had something special, because we emptied every engineering department in the area -- they came out and looked at the car. They'd seen it all, they're pros, all my buddies, we'd done countless cars, we'd seen it all, driven the world's finest and the worst, and they all came out to look at that little car.

Q This is the proving ground in Dearborn?

A Yes. In fact, I think I probably went back that day and said, "Lee, I think we've got a winner." And <u>then</u> Lee said, "I'll tell you

what. Let's get twelve of the automotive [writers] and see what happens with them." So we brought 'em in, like Bob Irvin of the Detroit News. I'm not sure he's still around any more.

Q He's retired.

A He was one of them. I forgot the guy from the New York Times. We had the principal twelve in the country. The New York Times, the Times Mirror out of L.A. Most of them, by that time, I knew. They just flipped. So Lee said, "That's all we need." All they wanted to know was when they could get one. They just flipped out. A set of hardened pros. It was just the repeat performance of what I'd seen with our own people.

So Lee says, "I don't think we're up to capacity. How much do you think Dearborn can make." I said, "I think they make 200,000 cars on a ten hour, six day basis." He said, "We need more cars." So he had the balls -- and this is Lee's final direct contribution. Earlier in the program, before we'd made and sold the first car, he went back and sold the second assembly plant. That was the ultimate masterstroke.

Q How did he do that?

A Sheer blood and guts. Now, by that time, we had the car. We had. at least, a reaction, and the people, who were then the powers that be, at least, had to admit privately, "That's one hell of a good looking automobile." Those with two kids may have something to afford.

Q Did you ever get Henry's final...?

A He just went along. He said, "I'm tired of hearing about it. I'm going to get rid of you guys. You'll sell it or it's your ass." So that's the story of the Mustang. Clear apart from the product -- Lee's ultimate act of genius was to get a second assembly plant. Of course, the product could have been in serious trouble because the second plant,

I think it was Kansas City, was behind, so we couldn't tool it up fast enough to meet all the demand -- but we managed to get 300,000 with overtime, roughly, out of Dearborn and 150,000 out of Kansas City that first year. The rest is history.

One of the interesting fallouts, clear apart from the product and the notoriety that went with it, was that Leon Jaroff at that time was bureau chief for Time. I'd known Leon. Leon was a classmate of mine from Michigan. The only engineer I ever knew that went into the journalism business and was highly successful. He was sent to Detroit, and we found each other again, so we used to sit around on weekends and talk. I brought him up on what it was all about. The result of which, he got the cover story for Lee while Jim Jones got the cover of the same week on Newsweek.

Q Oh, it was Leon who got that?

A Yeah. Leon did that.

Q I hadn't known that.

A I would feed them all the dope. So we enjoyed that. So, as I say, the rest was history on that one.

Q What about the introduction? That was quite a masterstroke. You mentioned it earlier.

A I should have brought my pictures in. I have pictures of Lee, Henry Ford and I sitting up in the back of the convertible on the esplanade at the World's Fair on April the 17th -- the PR shots.

Q Was that Walt Murphy's production?

A Walt was there in full glory, and they had a whole bunch of little white convertible Mustangs. It was all the news that day and for a week and all that stuff. A typical Murphy production. And I still have the

picture, along with a picture of Lee and I standing in front of the '66 Mustang. It says 4/17 by 4/17, which every dealer got, and some of the dealers still remember it, and every once in awhile I'll meet a dealer, and someone says, "I still have your picture on the wall with Lee." The two of us and the car.

There is a picture I treasure the most, which some reporter for the News borrowed recently. They were doing an article on Petersen. It shows a picture of the original Mustang team. Lee and I are standing in front of the car, and across the back are the team. Don Petersen is a young, college-looking kid; Hal Sperlich, even younger looking with a crew cut; Hans Mathias is chief engineer; Burt Andren; and Jack Prendergast all standing behind. Product planning team and the engineering team, and Lee and I standing in front, and each one of us signed the picture, March, 1964.

Q Is it an anniversary article.?

A I don't know. It's a background piece on Petersen -- on the new boy.

Q Tell us a bit about Don Petersen and Hal Sperlich in those days. You were very close to them. They were working directly for you, weren't they?

A Yes. When I became assistant general manager, Don became product planning manager, and Sperlich moved up, but still in the back room. Still a young kid. Hardly out of college.

Q Both of them were very bright in their own way?

A Yes. Both quite different.

Q One quite serious and other one quite explosive?

A Don was always very serious. He didn't suffer fools gladly, and it

showed. He had a lot of nicknames, He was not always well liked. They'd call him the cobra. And he particularly wasn't liked in styling. I got along in styling. In fact, Gene and I sort of got along. Again, I enjoyed the process. I liked to deal with them. I admired what they could do and that they could create these aesthetic shapes. And while I was nominally their boss -- boss in the sense of the functional job of getting the car done -- that was not the relationship. In fact, I still have a card somewhere that a bunch of stylists got together and made me an honorary stylist. I think it was the time I left or something. So I got along all right. But Pete -- well, Pete did not suffer fools gladly in those days. I think he's mellowed a little. I've seen him recently. Not a lot, but some.

Q He was never able to dissemble?

A No. And he is very, very bright, so that he was usually a step ahead of everybody, and, thereby, got people up on their -- it turned out to be a "I don't like the son of a bitch," rather than, "He's bright as hell, and he may be right." You could get the positive out of it, he'd get the negative too often. But he was a survivor. Plainly he stayed on and survived. And plainly I didn't. He was much more political than I was. He would scheme more. I was never a schemer. In fact, I was known as a "come and get the job done." So I was never known as anybody's camp, and Don became known, of course, as Lee's camp. Of course, Lee and I eventually came apart because I wouldn't join his camp or any other camp. Don joined the camp, and then he did the marvelous flip in the air, because he got out of Lee's camp and survived through all post Lee. Now that's a feat! That's a feat! But that's Don. Don is a very smart --I'm using scheming in the functional sense, not the negative sense.

Sperlich, on the other hand, probably just as bright -- much friendlier -- a warmer person. A much better sense of humor. Sperlich can be a joy to be around. Don, I'm not quite sure. Remember, he was always a subordinate. I don't think I necessarily would like to be around Don as an equal or as a subordinate. I'm not sure I'd go for that. Sperlich, I couldn't care less. He's a nice, bright guy. And probably was more creative, in a product sense, than Pete is. Pete's not bad, but Sperlich's more creative. On balance, more physical -- more product oriented. But he'd usually have a brighter idea. The minivan that Lee's made so many of, was a Sperlich product.

Q Squirreled it away and took it with him?

A That's right. That's typically Sperlich. You figure it out and create a market niche. Typical Hal. Don would be politically working his way up the ladder, but he wouldn't be worrying about market niche. Don would be more the craftsman; Sperlich is the idea man. That's another way of putting it. I gave Sperlich the Mustang as an early cub just to cut his eye teeth, and he did a superb job. Don got the job done, too; he just got it done differently. It's not a surprise to me that one became head of one company and one is second in command in the other. I don't know what's going to happen when Lee retires, but, at least, Sperlich is approximately about the same age. Different. I've said it three different ways.

I'd like to go back to the '62/'63/'64 period because, while I'm proud of my role in the Mustang, I'm much more proud of something that the world doesn't even know about. You get on that highway, every car in sight, including that truck, now has disc brakes and radial ply tires, and I did that. And I don't know how many thousands of lives have been

saved by those major improvements in the safety of automobiles.

Q How did it come about?

A I'll tell you the story. And that is most clearly, of all the things I did, what I identify most strongly with and is most clearly mine. Going back to the engineering research days I told you about, one of the projects, which had been around for a long time then and went along for a long time thereafter, was called a disc brake project. Now disc brakes had been developed in a very primitive form in Europe for many years, as had the radial ply tire.

Q Had they both been operational?

A Yes. And disc brakes were Ferodo-Girling. Girling was an English brake maker. They'd used disc brakes on some cars, not widely, but it had been known in Europe for some years in a very primitive form. Ferodo was the lining maker. Girling made the machinery. [Ferodo Girling] had been known in Europe, particularly in race cars. Very high-performance brakes; so common. There was always a little research project at Ford. And I can remember -- this is in the early 'Sixties now -- going to a meeting, and the subject of the day was to present, among other things that I had at that time -- probably as the assistant general manger -- the engineering research projects. I still kept that with me. All this stuff just going trailed along with my subsequent assignments. I still had an engineering research function, not the basic lab. That was Mike Ference under Kucher, although I think Kucher, by the time I'm talking about, probably had retired, and I think it was Mike Ference.

Anyway, we're going through the list, and I'm presenting the engineering research projects, and I come to disc brakes, and Henry Ford looks up and said, "Those goddamned things have been on your research

project list, Frey, for fifteen years. Either shit or get off the pot!" That's about a quote. So I came back, and I thought, you know, he's right. So I called the guys together, and I said, "We're going to put 'em on the American car." "You are?" I said, "Yup." And it must have been '61 when I was product planning manager, and we were going to pick the '64 Thunderbird -- small volume car -- and we're going to bet the company on brakes. That's life and limb. That's serious stuff. We were going to put them on a '64 Thunderbird. Well, I'll tell you, it was like moving a pyramid to change the basic brake system of a car.

Q Why was that?

A Well, first of all, the European brake didn't work in America. We had our own problems, because the cars were heavier, and, by the way, this is a commercial car. It wasn't a specialty car like a race car, so it's more serious. So we had to invent what's called a ventilated rotor. It's a hollow rotor. It's hollow and ventilated on the periphery so you can pump air through it while you're braking so you keep it cool. So we had that to get through. And that technology was derived from the Budd Company who made railroad car disc brakes that way. They never became popular in the railroad industry, but they did develop the brake, which had enormous requirements because it's for a heavy railroad car -- more like what we were doing with it.

Q You built up the heat that you had to dissipate?

A That's right. You had to dissipate the heat within the rotor, so it was a hollow rotor. We developed that. Because it's life and limb. We finally decided early on that we'd have to offer it as an option, not as a standard brake. So I decided that we would take and make it the power brake option, put the standard brake in the Thunderbird, and it

would remain the drum brake. That initially was to be fail-safe in case we weren't satisfied at the end of the development cycle that it was as safe or safer than what we were replacing, because we were dealing with life and limb.

The things we got into, because we were changing the culture of the place. They'd been making drum brakes for seventy years or what-ever. Nobody ever made these brakes before. I went to the Kelsey-Hayes company and persuaded them to make them. They groaned, because they knew they weren't going to make initially any money from them. They had to make a new plant; they had to do all kinds of stuff. It was a sure loss, but it had some prestige in it, I convinced them.

Then we got into everything known to man. We had to change the shipping schedule; how you ship the things. We changed freight car dunnage. I can remember all this junk. Finally I got into a big argument with Arjay [Miller] on the cost of this goddamned thing. The finance staff had finally caught up with what we're doing now. By that time I....

Q He was the spiritual heir of Robert McNamara?

A Yes. And as godfather of Ed Lundy. By that time my reputation or my -- I hesitate to use the word power, because I really didn't have the power -- I just said, "Put 'em in," and wrote the program later. It wasn't big enough to catch me on big bucks, anyway. I'm going to guess that the whole engineering and tooling program might have been five million dollars. A lot of money back then, but not overwhelming, even in '61 dollars. It might be a big deal today. Still petty cash by automotive standards. But the argument from finance staff is they discovered they were "going to cost more." I said, "Of course, they're going to

cost more. If I make five million of something, and I replace it with fifty thousand of something else, the scale alone affects the cost, and I know the cost is going to eventually go down." I said, "Do you realize that the first owner of the car will never change brake linings. They never pull when they're wet. They automatically stabilize to keep the car going straight, etc.?" "No, it costs more." So I said, "I'll tell you what I'll do. We're only releasing it on the power brake?" "Yes." "And we'll price the power brake option up to recover the cost." "I guess that's all right." Mutter, mutter.

Q Who was this at this point?

A This was Arjay and his minions Freddy Secrest and two or three others -- Archie McCardel before he went to Xerox. So mutter, mutter, mutter, but they didn't make me take 'em out. They didn't want to take me on because it was a better brake, lasts longer, all that good stuff.

So come time to start the car, and I said to the assembly guy -- Don Bastien was still then just nearing retirement. He became very ill. I said, "I'll tell the dealer to order...." It was under a guy named Matt McLaughlin at that time -- a sales marketing guy. I said, "Do me a favor. Don't put the standard brake out for the first initial order book on the dealer." He said, "That's this disc brake thing?" I said, "Yeah. I don't want to build any standard brakes." By that time, we thought we were all right. He said, "But that's one hundred bucks more dealer wholesale," or some such number. I said, "I know that. I'll tell you what. I'll get Kelsey-Hayes to make a cutaway model of the disc brake with a little demonstration piece to go with it for every dealer that sells Thunderbirds." As I remember, there were only about five hundred dealers that sold the car. So we made five hundred dealer show models of

the disk brake. The dealers never ordered a standard brake on the Thunderbird ever afterwards. Just swept the field. Never built the standard brake.

I got Kelsey-Hayes to tool the brake. And the car in which it was placed that year -- the Thunderbird -- was a great success. We probably sold more like a hundred thousand. We got more volume than we expected. The following year we put it on the Lincoln. The following year we put it as a power option on the Mercury. By the late 'Sixties, it was standard. Kelsey-Hayes had a lot of volume, and everybody is happy, and everybody is a hero, etc.

Q Were you first in the industry to come out with volume disc brakes?

A Yes. We were the first American car. We put the first disc brakes on an American car.

Q And that was the...?

A The '64 Thunderbird. The same planning time -- in this case, I'd been to Europe, and I can't remember who I talked to. Somebody I think I probably visited before I came home. They were just doing some work on radial ply tires. I'd heard about them, so I said, "Well, tell me about them." I was looking at tread life. They were fabulous tires, so I came back and told the guys -- this was benefit of nothing -- I said, "We're going to put radial ply tires on this same '64 Thunderbird."

So then I went around to purchasing. By this time, I'm assistant general manager and had the purchasing office. I remember calling in Firestone, Goodrich, Goodyear and Uniroyal. And none of them would make radial ply tires. They just refused. And I knew why, because if you double or triple the tread life, the aftermarket for radials go to hell. I said, "Hey, we'll price for it. I'll tell you what, we'll take the

average consumer savings of tire cost, and we'll split it. We'll price up half the difference --he gets half the break, and we'll price up the tire, and I'll split that half with you. "No, no." It turned out they were right, in terms of what happened in a narrow bean counting sense.

I went to France. I went to Michelin, and I put Michelin in business in this country. They said, "Sure." I said, "We have a planning volume of fifty thousand cars. I need fifty thousand car sets of such and such size, etc." "Oui, Messieur." So they put a little office together in Detroit, and we imported Michelin tires, and the same year Sears picked it up and said, "That's a helluva of an idea," so Sears put those tires in their aftermarket catalog.

Q It was incredible you could get Michelin tires from Sears in those days?

A That's right, and that's because we'd started them on Thunderbird, and Sears picked up and said, "That's a good...." So we started the ball rolling. It was really rolling, and the car was in production and doing well. I think we just released the one tire. We didn't put standard bias ply on at all. We didn't have to go through this dance of the bees with the brakes.

One day I'm up on the twelfth floor of the Glass House. I'm there early eating lunch, and Henry Ford comes in and sits down. He looks up and said, "Who put them frog tires on the Thunderbird?" knowing goddamned well who did. "I did, sir." "I don't like them frog tires. Why are they on there?" I went through, by that time, my standard speech, "You'll triple the tread wear, it's a safer tire, it can take high speed/high temperature driving on the Arizona deserts, and it won't fail, etc." "I don't like frog tires." I said, "Well, sir, I can't get an American

manufacturer to make them." "You can't?" "No, sir. I tried." He says, "Can I help? I want to get them frog tires off of there." I said, "Sir, if you can get an American manufacturer to make them, I'll be glad to take those French tires off." I don't know what happened. All I know, Firestone came in a week later and said, "We'll make your tires for you." That put them in the radial tire business. Of course, that's the standard tire.

Those two events -- there's really a third, which was more fun and games. Elmer Waverly and I -- Elmer then president of Motorola -- put the first eight-track stereo cassette cartridge player in a car -- also the '63 Thunderbird. I used the Thunderbird as the test car.

Q The perfect laboratory.

A So I was proud of that one, but that's more fun and games. But when I look out on that street (The Edens Expressway), every car on the road today has those two, these enormous improvements in the safety of driving a car. "The world little notes nor long remembers," but that's what I'm proudest of, because of all the lives that have been saved with that system -- these two moves which were....

Q And, obviously, this gained you a larger respect and recognition in your company's hierarchy?

A Yeah. By that time, I knew two things. First of all, I had it, and I knew I had it. I was "Mr. Products" by then. I did mention the following year we did the 1965 Ford car -- all new.

Q Yes. You were quite proud of it?

A Yes. It was a fully-competitive automobile. Modern in every respect; lighter in weight. In fact, I think it was the '66, which is simply the next year's grille change we put on the big one -- the LTD.

We put the disc brakes on that car, which was the first real buy -- that was a million units. By that time Kelsey-Hayes had several million square feet of manufacturing space.

Q What had happened? You said there was a problem in the short run with the profits from Kelsey-Hayes?

A Oh, sure, the start-up costs. Like any pioneering effort, they weren't sure if it was going to come out. And, of course, the big question, would G.M. ever adopt? Well, G.M. couldn't run fast enough with that, because that was right to their guts. That's what they stood for. And the Ford Motor Company, they put this stuff on, and this and this. In fact, you can read -- the only decent thing John DeLorean ever did journalistically was a book called On a Clear Day You Can See G.M., and you read that book, and we had them on the ropes in those days. Now, of course, subsequently, the company blew themselves up with Iacocca/Knudsen, Iacocca/Ford.

Q After you left, things went to pot?

A They did, almost literally. Well, most of it, anyway. But in those days, we had them coming, and we had the major features, the innovations, and they were important things. G.M. was not doing much of anything. They still had fifty percent of the market and made all the money, but they, at that point in time, were not the innovative leaders in the industry -- we were -- and they were very conscious of it. His book talks about that. Got pretty upset by us. These upstarts across town kept doing all these things. So that's another part of history which I enjoyed probably more, not in the sense of publicity and ego, but quiet satisfaction --what engineering and product planning is all about.

Q You're right. Think of all the lives that have been saved by those two products.

A That's right. And today it's everybody. We started that way. So I enjoyed that in a truly different sense -- I still do.

So what's it all about? I always thought that engineering was design. I didn't start off as a designer, but I certainly learned early enough in life that that's what its all about. And I think I even knew as a metallurgist that the end result of metallurgy was to make something and get it to last.

But in all those years, I finally discovered that the fun of it all is the creative step. I can remember a little thing. If you look on a car today, most cars -- it's all the big three, and, I think, most Japanese cars -- if you look at the heater, there's a high/low. You put the one lever at one position, the heat comes out underneath, you put it in another position, the heat comes out top and bottom. We started that. I got tired of cold winter months, start the car, and pretty soon your feet would so hot they were too hot and you were freezing above. So I said to the heater design group one day, "Why don't you put a splitter value in there, and let's put a two-position thing in there and have an option so the customer doesn't have to cook his feet and freeze his head. At least he can cook it slightly in both places." So we started that, and I got a kick out of that. It was an early thing I did. By the way, I can also remember Petersen saying, "What are you doing that for?" because it cost a buck, and he was product planning then. He thought that was a lot a crap and said so. I said, "I like it. It's improvement. That's the essence of design. I can improve the product. It will cost a buck."

I quickly learned in that game, it costs a dollar going in, but it

saves twenty-five cents coming out. All those numbers are phony. It's a very serious economic issue, so that's why the cost numbers were always phony, which I quickly learned in the Ford system. So you knew what you were really doing. It wasn't a dollar, it was twenty-five cents. By the way, if the McNamaras of the company got fussy enough, I said, "I'll take twenty-five cents out someplace else."

Q You were an early proponent for ergonomics? The comfort of the key person -- the driver.

A Sure. Safety issues were a problem. In this case, I'll leave out names, but there are people who once we'd done the '57 first crash-proof mirror and all that stuff wanted to take all that stuff out, and I refused. I just flat out refused. I said, "No, sir. I'm not going to take the responsibility of maiming the next group of people who hit that mirror." And there were some heavy breathers involved in that, and I said, "I will not take it out. It's all part of reputation, and I won't take it out." I don't think anybody really wanted to, because they knew I'd have said, "Put it in writing," and nobody wanted to.

And the telescoping steering wheel came in in those days, and we fought that battle to get it done right. That was the early days of Nader. I think it was -- what was his name? The first department of transportation that used to come out. Secretary Boyd, and I'd argue with him, because I wasn't against what he stood for, but, typically, bureaucrat -- he wanted to do it all wrong. I said, "No, no. If you do it this way, it will work." I can remember standing with him in the styling studio looking at some styling issues that had some safety basis and arguing with him.

Anyway, so along the way, I finally discover what design all about -- the creative process. I suppose there's nothing like the experience that a young man can have in which you've created something, and you walk down to the assembly plant, and as far as the eye can see, there's what you did -- or were head of the team or had a role in or got done -- whatever your role was. And it was better, safer, comfortable, better for the public, their money to buy it, but the essence is the art of design.

Q And the team effort that went into it?

A You have to organize the team. You have to be the leader. You have to stand for something. I can remember the fight over the '65 Ford gas tank. There'd been a scheme around the company for years and years and years to make the top of the gasoline tank the bottom of the trunk floor and save the extra piece, and I never would buy it because the difficulty was to maintain the quality control -- there were two difficulties: first the quality control of the weld. If the bottom half of the tank had to be welded to the trunk floor, and that bottom of the tank is tin coated. And the weld is normally made with two halves of the tank separately, and that weld, which is pressure-proofed and leak-proof, is a tough weld to make and high quality. And to put it up underneath the trunk floor is much more difficult, and you couldn't assure it was good quality weld. Secondly, when you hit the car from the rear, if the trunk floor is the top of tank, and you're crushing the back of the car, you're going to open up the tank. Whereas if the tank is separate, strap mounted, you've got a chance it will simply break away and slide underneath. It's a separate element, and since the gooseneck in the tank is rubber hose -- that wasn't necessarily true -- but you have a chance not to lose tank integrity.

Well, the product planning types, I called them a separate group. I was among them, but the non-design, product-oriented types knew you could save a buck by saving half the tank by making the top half the bottom. It came up in the '65 Ford, and I said, "No. We won't put it in." Well, somebody took that all the way to the top, meaning in this case Iacocca. I said, "Lee, I'm not putting it in. That's unsafe. It's less safe, and the number of rear end fires is going to increase." Guess what was in the '68 Pinto. Do I have to go any further?

Q Exactly the same situation.

A They put that thing in after I left, and they paid a heavy price for that. Now that story has never been told to anybody. I wouldn't put it in. And it wouldn't have been in there to this day if I'd been around the place. I wouldn't put up with that shit. I wouldn't now. That was a tragic end result. It turned out in the final trial that the company was held harmless on that immolation that occurred in Indiana. That had some other aspects in it, but you'll never know if the tank had been right, it might have even saved that life. So, you know, that's the other side.

What I finally worked out under the financial pressures of the company was a schema. To my knowledge, it may still be in effect, although the Pinto tank makes me question it, at least during the regime. I worked on a list of so called life and limb items, of which the engineer was the final authority. Nobody could overrule him, and I got a quasi-legal structure on it. And that would be steering, and lights, and brakes. I used that method to try to keep the ones that didn't care; except financially, it worked pretty good to a degree. At least it eliminated some of the arguments. "That's a life and limb item, and that subject

only engineering reviews on the thing." That helped. But we had that dark side going on a lot of the time.

Then, of course, I think that after I left, there was really nobody to take my place in the sense of a long history of acceptance, and somebody put that goddamned tank in. I'm sorry about that. That's wrong.

Q But before that time, your career culminated in being Jim Wright's successor at Ford Division?

A Yes.

Q How did that come about?

A Actually, I was Lee Iacocca's successor. Lee got promoted, and....

Q Lee got promoted on the basis of the Mustang?

A That's right, and he saw to it I got promoted to his job. I guess that's the way it went. In late '64 or '65 that took place, and I'm division general manager, which was as good or better of a job I ever had in business. I enjoyed that. However, that led to some problems, in that some people thought that I was Lee's rival. I never did, and, to my knowledge, I don't think I fostered it, but you never know how other people saw things.

So, by this time, Lee's getting pretty restive, and....

Q He's executive vice-president?

A Yes. And he didn't want any rivals around. That's for damned sure. And he killed off a lot of his rivals along the way. That's the other side of Lee. So he decided to reorganize the place, so he abolished the composite division general manager, of which there were two -- Lincoln-Mercury Division and Ford Division. Lincoln-Mercury Division was more of a paper house because they didn't design or make anything, but we

did both for them. He decided to abolish the job and make both Lincoln-Mercury and Ford into simply sales organizations and took all the hard hat stuff out and created a new concept called group vice-president for products. That was me. Got me out of the sales and marketing structure back into the purely product stuff with the saving grace of having a great deal of worldwide responsibility. That is the British and English, and I got involved worldwide.

Q Which had expanded greatly in the last decade?

A Yes, but I didn't like it. I always wanted -- I liked the Ford Division, because you had a chance to sell what you'd made. It was both ends, but Lee was adamant, so that was that.

Q Was it a deliberate move on his part, to blunt any possible successors, power and outreach?

A Sure. While my rival to him was more a figment of his imagination, that's how he saw it, at least at that point in time.

Q You had had quite a series of successes?

A Yes. And had a reputation, more admittedly, in the product side, whereas his reputation, and deservedly, was much more so on the marketing/selling side. However, he broke it up, and, by this time, this is now '67. I didn't like it, so late in the following year I decided to pack it up. What I really wanted to do was go run a company. By this time, I'm now forty-four, and, in my own mind, cock of the walk. I know, in retrospect, I had an exaggerated view of myself. It had been heady stuff in the Ford Motor Company in the last five/six/seven years -- ready man. I had certainly had my share of it. So I up and quit and went to New York and ran a company, and, eventually, came back out here in the Midwest. So that was the end of my Ford Motor Company career. And the

coup de grace of the whole thing was Knudsen arriving.

Q Tell us a bit about that.

A Well, as luck would have it -- I don't have to dwell much on how he got there. That's Henry's story, and that's been well publicized. To some degree, I think Henry did not want to make Lee the number two guy in the company, so he wanted to get somebody else in the meantime. I think he's quoted as saying at that time, "Lee wasn't ready," which he probably wasn't. Lee thought so. So he brings in Bunkie, which was tragic mistake from lots of points of view.

Q 1967, wasn't it?

A Yes, Fall of -- the year before I left. So Lee promptly set about getting rid of him. Now, as luck would have it, I'm about the only officer of the company that Knudsen really knew. So right from the beginning, bless his soul, Knudsen made it pretty clear to everybody in earshot repeatedly over the months that I was his boy, and, "If you want to get something settled for a product, I'd go tell Don what to do," or "Don and I have talked about it." I found myself in many situations which I'd have to go see Lee, my boss, to tell him what his boss had told me what to do. Well, that went over like a lead balloon. And it got worse and worse, and finally -- I can't remember, but it had something to do with engines -- and I was trying to get a new engine package -- no, I decided we didn't have the money for a new engine package, but we had to do something. I was putting off a decision, and Knudsen called me in one day, and he said, "What are you going to do about this engine?" I said, "We haven't got the money this year. We'll have to get it started, and we'll have to live another year. He said, "I want a new engine now." I said, "The budget has been approved. The finances are all set for the

year, and I don't have any appropriation for the plan." "I want a new engine plant now." So I went down to see Lee, and I said, "Lee, your boss told me to build a new engine plant -- get a new engine line -- new family." It had been a bone of contention anyway. It was not a new subject. So I go in to see Lee.

Q The engine or the line of authority?

A The engine. That [line of authority] was not a new subject, either. But in this particular case, as I had done many times before, went to see Lee and said, "Your boss told me to go get a new engine." Well, that did it, because at that moment, for the first time, Lee accused me of putting him up to it, because he knew I wanted a new engine.

Q He said that in so many words?

A "You put him up to it." I said, "No, sir, I didn't put him up to it. He called me." Well, I knew the suspicions had started. That was the end of the ball game, and it got worse and worse. In fact, I finally resigned -- I don't know what day of the week it was anymore -- to Wright Tisdale who was then general counsel, where you sent such letters. In five minutes Henry Ford called and said, "You resigned?" I said, "Yes, sir." He said, "You've made up your mind?" I said, "Yes, sir. I don't play games with that." "You really want to get out of here?" I said, "Yup." He said, "Why?" I said, "I'm tired of being the meat in a sandwich." "What do you mean?" I said, "I'm the meat in the sandwich. The top slice is Knudsen, and the bottom slice is Iacocca. You have a problem, sir. I'm gone, so I can tell you flat out, you've got a problem, and you'd better settle it, because I'm not going to get chewed up in this crap." Of course, it blew up the following year. Henry Ford

said, "Some things don't work out."

Q A typical phrase.

A I think that's he said.

Q What was his reaction to that?

A "Good luck." He couldn't care less.

Q After all those years?

A Couldn't care less. I don't think I flatter myself that there were vast parts of the company that were desolated by it. I remember Bill Innis, who then ran the heavy side of manufacturing -- engines, transmissions, chassis parts -- he says, "Who's going to keep the group together now?" I said, "Well, you guys better figure it out. Go see Knudsen."

Q By this time, you were product development group vice-president?

A Yes, and in the Glass House. I was, depending on how you want to call ranks, probably three or four in the company. They made you the product center of power in the company, with the exception of the agriculture part. I never did have anything to do with that. I really didn't want to get involved, but that was always kept separate for reasons of -- I guess it's quite a dissimilar product line. It didn't really belong with the mainline automotive business, which were trucks and cars worldwide. So that was the end of it! Seventeen years and something. But a sorrowful ending, really.

In retrospect, I'm glad I did it. I found a much more rewarding and a much more comprehensive career here. This is a harder company to run than the Ford Motor Company. It's more complex, but that's a side issue. The time had come. Sure, as it turns out, all three of the successive officers of the company since Lee Iacocca worked for me at one

time: Phil Caldwell, Don Petersen, Red Poling. Hal Sperlich is president of Chrysler. And people can certainly say, "What happened to you?" And I say, "I decided I didn't want to put any more time into it. They're happy, and I'm happy." I miss the industry, in the sense that once you get involved in that gigantic mechanism, you never lose it, and I still check the ten-day sales reports every week in the Journal and see who's doing what, but I don't regret it. The career here, as I say, is much more comprehensive.

Unless you're chief executive with Ford Motor Company, or, for that matter, General Motors, you really don't have a comprehensive role, because it's much more functionally sliced up. In smaller companies like this one, you don't have those life-support staffs in enormous numbers, or did have. They're cutting their overheads now, finally, to join the rest of the world.

Q Do you think you could have survived the Knudsen fallout?

A No. I wasn't made up that way. I put up with that stuff just so far, and I never could join a camp. That was my problem in the final result. I just wanted to make good automobiles and did for a lot of years. No, I couldn't have survived it, being realistic. I'd be kidding myself if I said otherwise. So it was going to happen one way or another. Perhaps I'm better off not to have -- I have gone through, at least, several of those -- there was two successive blood baths after I left. There was the Knudsen/Iacocca one, and, of course, the final Iacocca/Ford one, and the company was badly hurt by all that. Terribly hurt. Lost market share and will never get back to its former glory, because now there are other competitors like the Japanese. So it's tragic. And yet when I think back upon the days, they were a lot of fun. We did a lot of

things.

Q A lot of things you're proud of?

A I got a lot of business experience. Had some great teachers. As you know, when it comes to financial matters, McNamara was a master teacher. When it comes to market and selling matters, Iacocca was a master teacher. The best general manager I ever knew, bar none, was Ernie Breech, who was early in my career. So I certainly don't have any regrets on the reverse side. It was a great place to have been. I learned a lot, and, above all, I had a chance to do all those automobiles and do all those design things. I've been the heads of teams. In a few instances, I was personally involved, and in many instances head of the team that got the job done. So I don't regret a bit of it, including having left, but I still miss it. That's sounds paradoxical, but it's not meant to be.

Q It was an act of courage for you to do that, because you had a very pivotal role in the company?

A Yes. The company is now coming back. It'll be, in terms of share market, what it was, but in terms of the Don Petersens, who are product-oriented people, are being heard now. My brother, himself, is no mean role. He stands for the same things I do: build good automobiles as safe as you can make them -- finished automobiles.

Q He stepped into a couple of your roles?

A Yes, and has made a great success. In fact, I kid him. Some years ago when the Escort came out -- the little Escort, which was his first major car -- I asked him to send me a line drawing of the Escort -- the master assembly drawing -- and if he could dig through the archives and find the master assembly drawing of the Mustang, which he did. I have

the pair of them. I told him, "Brother, I've got to tell you, your car is far most sophisticated." That's front drive, cross engine, thermostatically cooled. I mean, that was a four wheel, independent suspension. A very sophisticated automobile. And you look at those two cars, and they look a century apart. The Mustang, essentially, a very simple car -- simple Hotchkiss rear suspension. And his car is very sophisticated. I said, "I envy you, in one sense. You're doing, as a matter of every day routine production, that which we used to do experimentally and hoped some day we might build one." So I get a kick out of that.

Q Did he meet your sales record with the Escort -- first year in production?

A They didn't do it domestically, but, as a worldwide, they do hold the record. I don't remember the numbers, but I think that's correct if you take the world at large.

Q I'd like to talk to Stewart at some time.

A You would enjoy talking to him. He's the engineers' engineer. There's a picture of him. That's a picture of me in a '65 station wagon. This is dual acting station wagon door.

Q How did that project come out?

A Yes, that's a story in itself. This was the product planning era, and I'd been looking at some market research data as to whether tailgates should open like doors or down like tailgates on trucks. And the market just split right down the middle; fifty-fifty. So what the hell are we going to do? We were in the middle of trying to decide what to do. My brother lived not too far from me in those days, and he was assistant chief body engineer under Henry Grebe at that time. And I stopped by his house one Saturday night, and we're sitting out in the kitchen. I told

him about the market research, and I said, "I don't know what to do. It's fifty-fifty." Ours had always gone down [like tailgates], and General Motors had always gone like that. I said, "We'd like to increase our market share. I wish we could have it both ways." He said, "I can design that." And he took a piece of paper on his kitchen table, and sketched out the lower hinge point on that door, which is the ball joint with an unlocking collar. So when you turn the handle this way, the door opens [down], and when you turn it this way, the door comes outward because you unlock the upper hinge point. In fact, he built the first model the next week with a ball joint from the front suspension. So that's how that started on his kitchen table.

Q The other picture is interesting from your Mustang days.

A That was the first fastback. That was the first derivative model. We did two initially. We did the hardtop, and then we did the convertible. That was the World's Fair introduction. Then the following fall -- and I think Gene Bordinat talked me into that one. That's the 2+2 we call it -- the fastback. That just added some more volume. Just kept adding this and that and this Fall, that contributed -- it was taken in the Fall of '64. Yes, and that must have been taken just at the time I became general manager. That was the Ford Division headquarters, and I'd just been made general manager. That was the headquarters building of my division.

Q Who was your PR man at that time in Ford Division?

A Walt Murphy. Walt was head of PR all the time I was there. I think later on he and Lee fell out somewhere along the line, and he got shipped to something. Something happened. I've lost track of Walt. I think he's retired now. He still lives in Birmingham [Michigan].

Q The story that came out after Lee's dismissal was that Henry II called him up one night about three in the morning....

A That's the story. And said, "You're an Iacocca man, and you're out."

Q He said, "Do you respect Lee Iacocca?" He said, "Yes, Mr. Ford, I do." He said, "Okay, you're fired." The next morning he was out.

A Yes, that was the story. He did survive. It was at Ford he didn't survive. Typically, Walt, if he respected Iacocca, he'd say so.

Q Did you get into racing at all in the 'Sixties?

A Oh, yeah. That came with the turf along about 1962 or '63. With my product planning type hat on, we decided we ought to get into some racing activities. It was getting back in. It goes by cycles. Then about that time, Carroll Shelby stopped by one day, and he had this cockamamie scheme. He wanted us to give him some engines, and he was going to put this into the little English two-seater called the A.C. Bristol, which he later named the Cobra, and would I please give him some engines. That's how I first met Carroll Shelby, and I can't remember how we brought him in. It might have been Walt Murphy for all I know, and we took a liking to each other. I said, "That's the most cockamamie thing I've ever heard of. An eight hundred pound car with a four hundred pound engine, but I'll go along with it." By the time he left, he had some transmissions out of me. So he built a few of them.

We went down that Fall of '62 to Sebring in Florida and raced this thing in one of the GT classes. Didn't finish. The thing led the pack for a few laps, but it didn't last very long. This was the first time the Cobra had raced. So we spent some money with him, mostly our money, and him spending it. Finally got the thing glued together to last long

enough to win a race or two. Then about that time they decided that we really ought to pay attention to the then fairly new phenomenon of stock car racing down in the Southeast part of the United States -- Daytona, and Sebring had a stock car race, too.

Q Talladega?

A Talladega. The Atlanta 500. Good old Franz, head of NASCAR, that was him. And the Pontiac was the big thing in those days under Bunkie Knudsen. So we entered the stock car racing circuit, and we won a few races and got the Cobra entered. Then we got really ambitious. By this time, I'd gotten enough stripes on my sleeve, and I announced we were going into the GT class -- the ultimate class -- and we would race at the LeMans twenty-four hours and enter the world class circuit: Targa Florio, Silverstone, Watkins Glen, Monza. There were about seven point races.

So in 1964, we put the GT-40 -- we put three of those on the road for twenty-four hours at LeMans. I think we led the pack for ten laps, and then boom, we made an ass of ourselves. The old man, Ferrari, wins again. By this time, Henry Ford is noticing all this ruckus, and he loved to go to Europe, anyway. He didn't like frog tires, but he loved it. He called me into his office one day, and he said, "You got your ass whipped?" "Yes, sir." He said, "You win that race." "Yes, sir. How much money do I have?" He said, "Who said anything about money?" "Yes, sir." So we got cranked up, and we modified that car, which was built by Eric Broadley in a little factory he built in Slough, England, utilizing another guy, John Wyer, who had been head of a little factory who came out of Aston-Martin. Colin Chapman of Lotus wanted to build it, and I didn't trust Colin, so I didn't deal with him. I did it with John Wyer,

and then we got Eric Broadley's designs.

So we got together in England and modified the car, and we brought back several sets of the power train, and we put a dynamometer cell together in Dearborn, and we mocked up the whole power train and took another version of the car and ran the track on the off season so we could reproduce exactly the gearshift pattern, the throttle location and mocked up and servoed the whole thing, and we ran the race in the dynamometer cell in Dearborn over and over. We finally decided we were going to run two twenty-four hours races back to back around the track, and we did. The meter's running.

So we built eight cars for the '66 race at one million dollars each. That was our bill. If anybody asked, it was Henry Ford. Nobody bothered me, just get the job done. Because everybody knew Henry said, "You win the race." And we were one, two and five, and that was the race in which Jacques Passino was crew chief. Jacques said to me, "Don, here's the position of the car. Is it still listed?" I said, "No. It's lined up, and all three passed the finish line together. A phalanx! The French press went wild. "The Yanks have arrived again!" All that kind of stuff. We just swept them away. And then is when I first met Christina.

Q She was an interested spectator at those events.

A And he hadn't yet divorced Anne McDonnell, but Christina was very much in evidence at the twenty-four hour races. I remember it was getting towards the end of the race, and I was on the pit side. The press was starting to bother us. The cup ceremony -- the final award ceremony -- was on the other side underneath the central stand where the French band was going to play the Star Bangled Banner. We had arranged

for a helicopter. Henry Ford had been in the pits to be with us. Picked him up on that side. They couldn't get across the track. The race is on. Picked him up, deposited him on the other side of the track in time for the awards ceremony which was ten minutes away.

There was a spectators' box above the pits, and up there I see Christina. I said, "Oh my God, I forgot to get her on the other side." About that time, she realized what's happened, and there's ten minutes to go, the race is winding down, he's over there, and she knew just enough who I was. I didn't spend a lot of time with her. I didn't want to, frankly. So I rushed upstairs, and I said, "I'll get you down." I forgot to tell you about my Italian sojourn with the Ford Motor Company, but, anyway, I knew enough Italian, and I was hearing Italian swear words I never heard before. She was cursing me out. Fortunately, Passino, the crew chief, he saw what was [happening] -- it was quick thinking -- so he managed to get that helicopter back and got her over there thirty seconds before the ceremony. So that was my introduction to Christina.

Lee got this idea in the early 'Sixties again and persuaded Henry Ford -- who I don't think took much persuading -- to buy the Ferrari company -- just buy it. The powers that be -- Lee and Henry -- decided to send a three-man team to Modena, Italy, to negotiate the deal with Enzo Ferrari.

Q The grand old man of Italian [sports cars].

A In Italian, they called him "Commendatore" Ferrari. So we put ourselves up at the Savoya Hotel in Milan and drove down to Modena each morning. Anyway, the head of the team was Tony Alec, who was something like business affairs manager out of the corporate staff doing oddball business assignments. There was an accountant -- a financial analyst

type guy -- that worked the numbers. I was sent along, I think, initially, as kind of an afterthought. Ferrari is an engineer. We're buying an engineering company, we'd better send someone along who knew something about engineering. So I'm going.

Q What year was this?

A 1964. So we got there. In due course, like in a few days, it was announced by Ferrari's gopher -- I've forgotten his Italian title, secretary of something -- that Ferrari really only wanted to talk to me. They knew we were racing. I think what he knew about me was, first of all, and primarily I was an engineer. I was some note in the company. That he knew, and he knew something about that the fact that I was running the racing team. So then started a certain degree of tenseness on the Ford team side, which resulted in Tony Alec going back to Dearborn early. Tony Alec went back; I stayed to complete what turned out to be a long and arduous negotiation unsuccessfully.

Q What were the stumbling blocks?

A Racing. We quickly arrived at a price for the company -- the Ferrari Automobile Company that made and sold what people buy as the Ferrari -- at six million dollars U.S. That was firm to buy the automobile company. But the real issue was the racing program. It finally got down to a key question, which we both knew was a key question, but he said to me one morning -- morning my foot, one afternoon. He never started work before noon! I remember he put his questions in Italian. He finally tried his bad English, and I kept trying my bad Italian. But the question was the Indianapolis 500. He knew about that race. He never raced in it, but I think he always had a hankering to enter it.

Q There are no Ferraris in Indianapolis up to that point?

A If there was, it would be 1921. He said, "If I wish to race Indianapolis 500, and you do not, and you buy me, do I race?" I said, "No. If that's the final conclusion, you don't race." I didn't want to kid the man. I said, "That's not likely to happen. But as you posed the question, that would be the answer." I think that might have been a Wednesday, and the following Saturday I was getting ready to go see him. I was going back after the weekend, and he sent word to me that the negotiations were off, and within ten days, it was announced that the Fiat company had bought Ferrari. That was the outcome, meaning Fiat would give him carte blanche [to the race].

We came close, but it still was a miss. I remember we sat around for days on end discussing whether the logo would be Ford/Ferrari or Ferrari/Ford. I can remember that yet.

Q What would have been the problem with that condition you posed?

A Simply because had he posed the extreme question, "Is there some reason?" Maybe a U.S. safety law or some regulatory problem, and we simply couldn't race, which became an issue later on because racing became considered unsafe. And the company actually backed out of racing because of adverse publicity. This is the height of the Nader safety issues. So the condition that Ferrari was asking about turned out to be quite real. So the issue was that. He wanted a free hand to race, and how and when and where as he wished. As a member of a large company, he simply had to recognize this and not be some separate entity. I explained all this.

I also had the sense in the end that he couldn't really bring himself to do it, and he was looking for some available out. He picked a good one. Then the sequel to the story is I got back -- had to report

back. Henry wanted to see him. That was it. And he came along and wanted to see me. What happened, why?

Q Henry came to Europe?

A Henry wanted to see me after I got back from Italy. "What happened?" I told him. Why did Tony Alec get sent back, because he didn't wanted to talk him, he wanted to talk to me. "Why?" "I'm an engineer." "Oh. What happened then, etc.?" That's when he said, "You go to LeMans and win and beat his ass." That's right. I forgot. That was the start of that.

Q Beat Ferrari?

A Right. Then the first team went off the track, then they called me back, and I said, "Just go over there and win," and I said, "How much money." He said, "I didn't say anything about money."

Q You were the architect of the LeMans victory? In a very real sense? Do you ever see Passino any more?

A No. I was thinking about him the other day. I saw Roy Lund, who's one of the engineers we used on the racing team, who later on became chief engineer of American Motors, and I ran into him just as he was retiring from American Motors.

Q They reactivated what they call the SVO?

A Yes. Special Vehicle Operations. They gave that to young Edsel for awhile. In fact, they put together some five liter Mustangs to race. I noticed at the Grand NASCAR circuit now, there's a lot of Thunderbirds. It's a very slippery car. They get those five liter V-8's in there, and there's a lot of power.

Q The racing interlude must have been an exciting time for you in many ways?

A I'll tell you, I enjoyed it for awhile.

Q It grows thin after awhile?

A The deaths started getting to me -- the injuries. So many any given season. You just go to so many of those. And when Jimmy Clark was killed in Hochenheim, Germany, in a Formula I nothing race with one of those damned over-stressed front suspensions that Colin Chapman was fond of doing. He had a suspension failure. He went right into a tree at one hundred fifty miles an hour. That did it! Jimmy Clark came from a place in Scotland on the border, very close to where my ancestors on my mother's side came from, so it hit hard. I told one and all that I wanted no part of it. I don't flatter myself, but the company was ready to quit anyway. They ran even after I left -- a few sporadic things. They petered out. But Kenny Miles was killed in Riverside. What was the name of the little, short Australian driver at LeMans who was killed in Silverstone? [Bruce McLaren].

Q In connection with the racing period, I wanted to ask you about those various cobbled-together Dan Gurney Talladega specials. Do you remember the background of those?

A You're talking about the -- these are a variance of the stock car racing.

Q Right.

A There was nothing highly unusual about them. They were the normal stock car, which meant that the resemblance to that production car for the ordinary person on the street was probably limited to the color of the paint. Underneath that thing was a completely different animal.

Dan was an interesting driver. Drove almost every class Ford. He'd drive Formula I, he drove GT, he ran stock car. He'd run anything.

One of the most difficult drivers we had, terribly hard on the car, beat the hell out of them. There is a great difference between drivers and cars. I'll give you Clark, for example. He could drive a car in a race, complete the race, and the bearings were barely polished. And Gurney, who clutches the brakes, there was a great difference, and we very quickly learned which drivers would beat up the car and which would not. A.J. Foyt won the race [1967] at LeMans. He and [Dan Gurney] spelled each other in that car. We liked to have A.J. race. The crew chief liked him. He wouldn't beat up the car. They knew his tire life would be longer. There is a big difference on how they handle that car out there in terms of durability, and reliability, and tires, and the braking system, transmission failures, and the clutch. The risk elements you could face. But Dan was a universal driver. We all liked him, but he sure beat the hell out of a car. I don't think he's racing much any more.

I've still got the LeMans cups. French Cristoffal. In fact, if the truth be known, I think I've got an original set. I think the ones that Henry Ford got were the duplicates. I don't know if the world knows that.

And Dan Gurney's Cobra finally won its class at LeMans, too. We finally got the thing to last twenty-four hours. But, again, the resemblance to that and the original Bristol was hardly the same car.

Q You did get quite a bit of mileage out of those?

A We, of course, copyrighted the name Cobra, and that became a model of the Mustang itself. I've noticed that Lee [Iacocca] has picked up Shelby all over again for Chrysler. They can't call it the Cobra, they call it something else. Shelby Special or something like that. And I

see where Iacocca has got now -- with Lee, it's deja vu. You can plot. I saw it all in his formative years. Now he's done the deal with Maserati, is it?

Q Yes.

A So he's done his deal with Maserati instead of Ferrari.

Q You can get a look at it at the Chicago Auto Show.

A Lee's pattern is he's back with the Shelby. The old chicken farmer.

Q The Daytona?

A Daytona. But he's got the same pattern. I get a kick out of him. Same cast of characters. All older. Twenty years later.

Q You were the only one that didn't go to Chrysler. He picked up Matt McLaughlin(?) a year after he terminated with Ford. He's been there for awhile.

A Then let's see who else? There's Bill Bourke, who's now at Reynolds metals?

Q Yes.

A He was around then, but he escaped Detroit, in a sense, but then came back there.

Q Yes. You get caught in that terrible flack of the 'Seventies?

A Yes. He was in the early fallout of the ultimate Iacocca/Ford shootout. But to repeat it, our friend Petersen survived that.

Q How do you see that? That was kind of an anomaly in the sense that he went through all those years and yet came out somehow [unscathed]?

A I was not there during those periods, so I can't give you -- but I can guess, knowing the actors in the play, that Don sensed with the exquisite political savvy at exactly the right day said, "Move from

Iacocca towards Ford." Early, not late, because if you'd been late, you'd have been out like Walter. So he could sense the day, and had exquisite taste in everything. I'm sure that's what he did, and that crucial day.

Q Precision timing?

A Exquisite timing.

Q What are your recollections of Iacocca's successor, Phil Caldwell?

A I liked Phil. Phil was running the truck operations.

Q Very cautious fellow, as I understand it.

A That's putting it mildly. Somebody was asking me about him recently. I know who was asking about him -- David Halberstam. You've got to understand, the company's style of management goes in cycles. You usually plot strong/weak dealerships like this. Strong, weak, strong, weak, and what happens is, particularly after the Iacocca era, they were so fed up with divisive fighting, struggles at the twelfth floor that they wanted to put someone in who is quiet and wouldn't make waves, and stable, and Phil was a perfectly obvious and logical candidate. And lo and behold, Phil is the chief executive of the company. The first non-Ford head of Ford. And certainly with the transition piece between pure Henry Ford and today a professionally-managed company with probably only a slight possibility that Edsel II ever becoming the head of the company. I suppose it's a possibility. They still own a lot of stock. They have control. But it's not likely.

Q Phil Caldwell has a reputation for being very cautious, never taking a bold step without thoroughly researching the consequences and the rewards.

A Phil made superb decisions, but he certainly agonized over them. I remember when it came time to do a new Econoline -- remember that little van? -- and we'd had some trouble in the latter years -- the original Econoline van's life --from a safety point of view. And I, for one, was always bothered by that vehicle. As you may remember, the engine was upside the driver, so between where the driver sat and the accident is one layer of sheet metal. So loss of legs or a few other things was not out of the question. I said to Phil one day, "You've got to do a new Econoline. You've got to figure out how to put that engine to help the driver." Because the key to most cars is the front. If you've got that mass to absorb the energy on an impact, at least it helps.

That was early in the planning era, I don't remember the date, but let's say it was the 1966 model year with the plan, and this might have been the Spring of '63, and we had to get ready to start releasing production drawings by that fall. I saw Phil in the hall, and I said, "How are you coming along on the van?" "Well, we're starting this, and we starting that." Finally, it's July or August, and I said, "Where are you in that van?" I said, "Wait a minute. Let's go over to the truck center, and we'll get this thing settled." So I walked in this big room over in the truck engineering department -- four lengths; four widths of this room -- and all along the wall are full-scale drawings of various van configurations with the engine front, turned on its side, mid-ship, you name it. There must have been thirty variations in there. "Which one?" "Well, we're starting...." "It's August, Phil!" We're not leaving this room until we decide. Now you collect all the data: cost, weight, whatever comparisons you've got." I don't know how long we were there, but it was a long time. I said, "Phil, that's the one we'll put in pro-

duction unless you've some other." Did he have an exhaustive consideration? Sure as hell, I knew more about van configurations than I'll ever want to know. He had them all, but we had to get to the point. I guess we picked the right one.

Q Yes. Came out pretty well.

A Sold a lot. It was an improvement.

I talked to him the other day. We were back in New York. He's doing super. He's joined Lehman Brothers as a senior investment partner. They have a habit of taking retired industrialists in as their senior partners, who have, of course, great capability of getting business from their previous associates. They're always looking for business, but we haven't given them much. And they have done something, although our investment banker is primarily Salomon Brothers today. And he knew that.

Q They've come through a problem lately, too?

A They threw out their founding partner and John Gutfriend, an old friend of mine, has emerged triumphant in a reverse takeover sense.

Q What about Red Poling? How do you assess his career to date?

A He's the good one. He's very complementary to Pete, in the sense that their skills complement each other. I knew him as a controller. He spent enough time outside of central staff into operational controllerships so he had a very good sense of operations. Very financially oriented, which, to be fair, has got to be a major consideration, and even more so, in one sense, than in my day because the companies don't have any money any more. They don't have the cash flows, and, of course, the ones in the valley of the shadow of '81 would terrify anybody. I think that the two set each other off very well. Don was primarily the

product person, although he was no mean financial analyst; had financial orientation. And Red, of course, is primarily the financial person. And, of course, at least in the early resurrection days, the principal financial problems were domestic U.S. Now they tend to be more overseas. And enough of a product man to get by, so the two complement each other. I think it's a good team. I think it's the best team running the Ford Motor Company since, frankly de facto, Lee and I were. De facto, in the sense that we didn't have the titles, they have, but still we were still running it -- at least the domestic company.

I don't know what Ford's overseas were like and how they're managed any more. They weren't well managed when I was there. They got well managed, and now I don't know what they are. I'm much more familiar with the domestic scene. And I would say that Poling and Petersen together are by far the best management that they've had in that company in....

Q Do you see Poling's ascendancy as a triumph of the bean counter?

A No. He is, and he isn't. He's got enough operational smarts and experience to not be the extreme form of a bean counter which is mindless. Nonetheless, he's one hell of a tough sharp cost cutter, and he's had to be to prune that U.S. side back and try to make some money in the domestic side.

Q They've just brought along a young protege of Ed Lundy's up very fast.

A Which one?

Q [Allan Gilmour]. He just got promoted to an executive vice-president under Poling.

A The one he's gotten in the Ford Division is Lou Lataif, who is very good.

Q [Gilmour] is not a product man; he came up from the controller's area.

A There's no question that a protege of Lundy's would like to get up in particularly that large of a scale of operation. But my brother grouses about Red some, but I don't think seriously. Red's approach may be first financial, and product second, whereas Pete's and my brother's would be product first, financial second. But there was enough commonality of interest to get along. And to repeat, that's the best management structure they had in the company for twenty years, by far. It's an automobile company again, and the products are showing it.

Q You're in favor of the new approach to the product design?

A Oh, sure. The new regime's products started with the Escort, followed by the current Thunderbird, all of which were first-class automobiles, followed by the Tempo/Topaz, and now followed by the Taurus/Sable.

Q They just came out. They're banking everything on that.

A I think it's a winner. I think their styling was risky to begin with, and it's becoming the avant garde style in the industry. And that's Pete [Don Petersen]. Pete always was very styling oriented.

Q Telnack tells the story where he said Petersen came to him and said, "What would you like to design?"

A So that's the stylist.

Q He said that to Telnack/Kopka, "What would you like to design?" And they told him, so he said, "Go ahead and do it."

A Pete would do that. Great sense of styling. He's probably got -- outside of styling studio itself I'm talking about -- now Gene's retired -- by far has got the best sense of styling of any general manager of the

company.

Q It certainly shows in the 'Eighties?.

A Yes. Iacocca's sense of styling was more Italian baroque. He wanted to put that goddamned opera window on. I thought that was terrible, so did everybody else, but he was the boss.

Q I've interviewed a couple of the people who you've probably worked closely with. Lou Veraldi?

A Oh, yes.,

Q Lou has become the sort of guru of Team Taurus. He put that together. John Manoogian, who is his right-hand man in terms of product quality control?

A Yes. John, of course, got the quality job when I was there. I put him in there. That was an early move.

Q He's still going strong. He tells the story about how Caldwell said, "You'll have to take it." He said, "I don't want it," so he wouldn't take it. That's the quality control job. The product -- Job One. [Caldwell later talked him into it. Ed. Note.] Another one of your former confederates in product planning I've talked to -- Will Scott.

A Oh, yeah.

Q You and he must have had some great times?

A We had more fun together. Will is an iconoclast with a great sense of humor, and we had a lot of fun together. I enjoyed Will. The last time I saw Will was at the Caldwell wedding. That's five years ago at least?

Q Chalmers Goyert said to remember him fondly to you and said you had some good times together.

A We did, indeed.

Q Bill Burmeister -- you knew him, also?

A Oh, gosh, he was just a kid at that time. And who was Chalmers Goyert's -- had another guy with him that's also a good friend. I'm embarrassed. He was a rear admiral in the reserve. Chalmers would remember it instantly. He was Chalmers' sidekick, and he was over in the design center. During my latter regime, Will was in the corporate staff. There was corporate product planning for awhile, which is a big nothing. Will knew that. He's all fun, and then he got involved in government....

Q Yeah, they took him off planning and got him into government relations.

A He would do extremely well at that.

Q He does, but he says he hankers after the old product planning days.

A Oh, I can believe that. The corporate world he had was a big nothing. I think Will probably looks back most fondly on the job he had as product planning manager which directly preceded me in the same job in the Ford Division. Will operated primarily under the McNamara regime. McNamara was head of the division for quite a long time -- '56 to '60. That's off a year. Four or five years in that job is a long time, and Will was his product, I imagine. He's got great McNamara stories to tell.

Q I'd like to hear about your career with Cable and, especially, with Bell & Howell. Let me ask you one question. Any last thoughts summing up your career at Ford, which, obviously, was one of the key episodes of your career and one you apparently enjoyed very much.

A I did.

Q You came through the gamut from a beginning research scientist to pretty close to president of the company, and, as you say, de facto, in a sense. Any last thoughts about your career there?

A No. I owe a great deal to the company. By virtue of being at Ford, I became a member of the business elite. It was not difficult to move from the job as president of a major company along to this company, and that's because of my career at Ford. So I owe a great deal to the company. I have a great deal of loyalty to the company. I'm loyal to the institution -- the company -- more than perhaps any overwhelming loyalty to any particular person. I certainly learned a lot. I had some great mentors -- McNamara. Modestly, early on, Breech, There was McNamara. Lee himself. I don't really think Henry Ford was ever a mentor, in fact, I know he wasn't.

Q But he obviously kept track of your career, and without his okay, some of it couldn't have occurred.

A True. He was the boss of bosses. I guess Henry Ford to me represents a mixed bag, as does Lee, for that matter. But, all in all, I certainly owe a great deal to the company and big personages, particularly McNamara and Lee.

Q Did Breech keep an avuncular track of your career?

A Yeah. And I understand when I left, he raised hell.

Q That's interesting.

A He allowed how he was to get me to come back. By that time, he'd retired. In fact, I have his retirement dinner calendar on my desk. It was given to all of us at the dinner that night. It's got my initials on it and says, "Ernest R. Breech retirement dinner, April 11, 1967." I think that's the last time I ever saw him. This is his retirement from

the board.

Q Not from the chairmanship?

A He had retired almost ten years before that. I remember the occasion, and that was about the last time. I might have seen him once after that. But when I left the company, he was really mad about it, I guess. I was told he was, because there was a certain avuncular relationship. He could rightfully claim to have gotten me in the company and started off my career, and I think he felt very upset and might have felt hurt. I don't know.

I left the company in September, 1968, and rattled around for a month or two deciding what to do. I had two things happen at that time, one of which was long term and one was short term. I had an offer to go down and be president of General Cable Company in New York.

Q What was and what is General Cable?

A General Cable is a communications gear company. At that time it was a very modest version of the equivalent of Western Electric but for the non-Bell Telephone companies. Independent. GTE was their biggest customer. They did make everything Western Electric did, but they made junction boxes, utility trucks, and, above all, they made communications cable. That's why their name is cable company -- trunkline cable. They also made powerline cable, they made household wiring. They made all kinds of wire, cable, and then sold a lot of hardware gear. They were kind of a modest version of the Western Electric Company.

The business was a metalworking business, primarily, one of which I knew professionally. It was not going to be, you might say, an all-encompassing demand on me to run it. I think I instinctively knew that I was going to take something that was a transition role somewhere. That

one came along without any necessary long-term commitment.

Q So it fitted the bill perfectly?

A And that's what happened. I think, as I've observed people, particularly those that come out of Ford, they rarely bounce in the right direction the first time out, anyway. The withdrawal symptoms of that great big -- G.M. would be the same; any large company -- are such that you can't assume for yourself a great deal of decision-making ability for the long term. I think I knew that. I picked something I knew I knew. It was an easy business for me to be in by virtue of my background, both engineering and metallury.

So off I went to New York for a period of three years. The other thing that happened that Fall, which had long-term implications, was that Pete Petersen called me -- I may be off a year, but it was after I left the company -- and said "How about becoming a member of the Bell & Howell board of directors?" Now that's another story. First of all, the only person that ever got outside directorships in Ford Motor Company was Henry Ford. He was adamant on anybody else -- nobody else -- and Pete knew that, so there was no sense in asking while I was with the company to do anything. Even to the point I can remember Henry Ford was deadly on doing anything on public service of major note on any officer's part. I remember one time years ago -- years before that -- it was in the Johnson administration. I'd gotten involved in a modest committee activity in Washington on something. I think it was a branch of the National Research Council, but there was something to with Congress, and the next thing I knew Califano, who was then Johnson's assistant, called Henry and wanted me to take an appointment as the head of some commission for the President. It was a commission on public housing. And, I guess, Henry

Ford just raised hell.

Q What year was this?

A 1965. The next thing I knew, I was called over. I said, "I don't know anything about this. What are you talking about?" "I told them you're not going to take it." I said, "Yes, sir."

Q He did assign a lesser role than you had -- one of his old buddies to one of Johnson's public jobs program -- Leo Beebe?

A Yes. But Henry Ford took a prominent role in that himself?

Q Right. He was the de jure head, but Beebe did all the footwork.

A I think you could get a significant personage in the company involved in a government commission if Henry Ford felt he was a part of it and was the kingpin, but this one came in all wrong. That was the end of that.

So Pete called me. I demurred for awhile. I said, "I'm going to New York. I've got a new job, but keep me in mind." And, sure enough, he came back two years later in '70, and I became an outside director of this company.

Q Who was that?

A Pete Peterson, the then head of Bell and Howell.

Q How had you gotten together?

A I'd learned and become knowledgeable and, ultimately, a friend of Pete Peterson in the late 'Fifties. He had been hired by the product planning function somewhere in the company, and I got mixed up dealing with some product issues, and then later on as product planning manager on market research, and Pete, at that time, was an executive with a company called Market Facts, which is still located in Chicago. The company board hired Market Facts to do a lot of research with some products.

That's how I got to know Pete.

I remember coming here in the early 'Sixties to meet with Pete on some research work. Then he left Market Facts and became -- I don't know whether he became the Chicago office head or not for McCann-Erickson, but he went with the advertising agency. He then left there and became head of Bell & Howell. He was brought in by Chuck Percy.

Q Who was leaving for the U.S. Senate?

A He was leaving for the Senate. So that's how I got to know Pete and how I got to be an outside director of this company.

In fact, we were here at O'Hare Airport early in the winter of 1970. I'm an outside director. Maybe it was my third or fourth meeting. I'm a new boy, and Pete ups and announced to the board of directors that he's going to Washington as a special trade assistant for the first Nixon administration, for which he later became Secretary of Commerce. Well, it took the directors by surprise. In retrospect, it shouldn't have, but it did. And, of course, then what to do? In the meantime, I'm running General Cable. I'm an outside director. There are two obvious candidates: a man named Wagner and a man named Bowles.

Q These were the two obvious candidates?

A Yes. And they cancelled each other out by saying each wouldn't work for the other. That was the next meeting.

Q Was that a tactical mistake on their part?

A Yes. They were both out! They stayed with the company, but that's part of a later story. So the late Charlie Mortimer, who had then just retired or was about to retire as head of General Foods, was appointed the head of the executive committee to search for the successor. I can't remember how he arranged it to get somebody to run the company, because

Pete, in the meantime, had actually gone to Washington. The company had no head in the sense of the chief executive. So he put together a concept of a three-man chairman's office: Bowles, Wagner and Larry Howe, who was then general counsel for this company. He brings all this to the next board meeting and announced it. I had suffered in the Ford Motor Company under one of the periodic upheavals in the front office under Henry Ford, and they had their office of the chairman concept there for awhile. That was the [John] Dykstra/Arjay Miller/Ford regime. That was while I was head of the Ford Division and just before or after Lee was group head, and they had this three-man office of the chairman. It was chaos. It was one of these periodic phases of the moon type stuff from Booz-Allen. It was awful. So I spoke up and said, "That won't work. That's nonsense. I lived under the thing. It's a lot crap. Let's just organize here and go get a chief executive -- get someone to run the company." That kind of blew it out of the water. Now, there were two people on the board at that time who knew me. One was an incredible coincidence of Joe Cushman, who was then the retired head of Sears, was on the Bell & Howell board and on the General Cable board. So Joe is watching all this. At the same time, another board member was Ted Yntema, who had retired as chief financial officer of Ford and whom I'd known for many years. Knew his nephew Hessel, knew his brother Hessel, Sr., who was professor of law at Michigan. I'd known the family and known him, and he's one of the financial types that I early on decided "let's understand what they want so I can make my way with my stuff." So he and Lundy and the Millers I got to know and got a certain sense of trustworthiness because they felt I would be responsible. I couldn't always do some of their bean counting for them, but I would make sense

financially. Simply to get the job done. Part of this no authority, all the responsibility type routine I've told you about.

I can only guess that during the meeting or after the meeting or something the two put their heads together. So at the next meeting Joe came up and said, "How would you like to run this company?" I said, "Joe, I'm president of another company." "I'll take care of that, and which you're a director." Both he and I are standing with a conflict problem. "I'll take care of it." He took care of it all right. I'll tell you about what happened in a minute.

In the meantime, Charlie is going to put a four-man office together, and he'd heard rumors about me, so he puts me in the trap. In the meantime, Joe goes back to tell the chief executive of General Cable what had happened, and the chief executive calls me up and said, "I want your resignation. You can't be fooling around there and be a president of this company." So I gave my resignation.

In the meantime, between handing in my resignation -- thank you, Joe, now dead -- at General Cable, and the next meeting, I was unemployed for forty-five days, so I was only taking a fair amount of risk for what the hell happened. So the next meeting comes up, and damned if Charlie Mortimer doesn't come in with a four-man idea, and they put me in it. So I said, "Hey, Charlie, I said once before, these things don't work. Let's cut through this. Several of your confreres have asked me if I'd like to be. That's up to you guys. Say what, either elect me as chairman -- the chief executive of this company -- or that's it. I want no part of anything else. Chief executive -- I'll take the job. Elect me or I'm out. That's it," and I walked out of the room. Two hours later I was elected chief executive, and Charlie Mortimer has never spoken to me

since! Well, he did, but was plainly not the same.

Q Where is he now?

A Dead. Died five/six years ago. He retired as chairman of the executive committee of General Foods. So that's how I got here. I did not work my up.

Q That's a marvelous story. What kind of shape did you find the company in? How had Percy left it, and, perhaps by extension, Peterson?

A Percy left it in good shape. Pete left it in disaster. It was headed for bankruptcy.

Q What had happened?

A It got caught up in the conglomerate craze of the 'Sixties, and Pete played that game magnificently. Lots of things: created an image of the company of an avant-garde educationally-based company. He was all for software/hardware systems. By '69, I'm in New York, and he's got this company up to ninety dollars a share at forty-five times earnings. Peaking at forty-five is unheard of today, and he got it to forty-five. But as was so typical of those years, you can buy earnings just so long, with over-valued stock buying companies, and it started to catch up with him later in the year of '69. The first thing he did is to get somebody under him who knew how to run all this stuff, because it had conglomerated like spider webs.

Q Who had they picked up?

A They bought the Merrill Publishing Company, the Devry Schools, Wilding which is making commercials today. Something called Human Development Corp., which is a T-Group. I had the pleasure of getting rid of that, because we were getting sued by some woman who took all her clothes off in some session, and we videotaped it. You name it, we had

it going.

Q I used to work with some people who ran T-Groups.

A So the stuff started to unravel. So we get Henry Bowles -- that was one of the men that cancelled themselves out -- came in from IT&T as president, and he started unloading some of this stuff. However, the famous "Black Friday" -- some January Friday -- Pete had to make that announcement under the SEC disclosure rules that our earnings for that quarter were going to be down. The light goes off. The stock went from forty-five times earning or ninety dollars a share. It dropped in half in a period of thirty days. So by the time I got here, the stock was off the peak of ninety-five; it was down in the thirties. [old basis] It went up a bit because of the assumption I was a miracle man in forty-five days and went back under the slide and hit a low of eight and three-quarters by the early 'Seventies. In fact, you could have bought the company at that point for its ninety day receivables. It couldn't get any lower.

So I had the pleasure in the first twenty-four months here of watching it go from thirty-five to eight. And the place plainly was -- its core business is with the consumer photo business, which was over capacity -- highly-saturated -- and movie business, in particular, was based on family formation of family events. Well, family formation in the United States at this time is dropping rapidly, so that the movie camera market was shrinking. The Japanese had typically put in too much capacity, so everybody was peddling for whatever they could get in the marketplace, and the margin went to hell.

If that wasn't enough, it didn't take too many smarts to figure out the video age was coming. In fact, the year after I got here, Sony

introduced its three-quarter inch pneumatic tape player, which would be the first almost consumer product. Not quite, but it clearly was the precursor for things to come, which eventually became Beta and VHS.

Then, in addition, the other core business of the company was the home study or correspondence school business, which really was the original Devry. They devised the residence school system. That wasn't what it was then; in the major sense, it was home study. And it was headed for the rocks because there were so many fraudulent ripoffs -- truck driving schools, the whole bit. And as I explained to the board, subsequently, I said, "At some point you get tired of trying to prove you are legitimate -- the only virgin in the whorehouse." So we got out of that mess.

They had all these rinkydink businesses, most of which were losing money. So there entered a long period of pruning, pruning, pruning. They bought a few companies. In 1975 -- I'd been here a little over four years -- I wrote off the consumer photo business. Sold pieces of it. Liquidated it. The following year I liquidated the correspondence school business. In the meantime, I had sold these little things all around the place. There were something like sixty businesses sold in the period of four years, during which time the stock languished between ten and twenty [old basis] -- nothing! Our earnings were erratic. And by the time we got the correspondence school business out of here, the consumer photo business out of here -- oh, in the meantime, tried three times to get into the video business in some form. Formed a joint venture to make video tape players for the home, no less than RCA. That failed. RCA proved not to know what the hell they were doing. Managed to get out of that one with a whole skin, barely.

Then followed another joint venture with the great German company, BASF. That failed. By that time, it's a dollar short and a minute late because the Japanese were planning -- practically owning the video player for the consumer. But in the meantime, we had started a little tiny company over there in the Hibbard warehouse -- it's about three miles from here -- dubbing video cassettes for some customers, the principal one of which was the Ford Motor Company and Iacocca who wanted to put in the first industrial video network ever, and he put in six thousand Sony pneumatics, and we did the teleproduction work with the then company called the Wilding Company in Detroit.

Q They've since merged, but they're around.

A Yes. They merged with a St. Louis company. We sold them to the St. Louis firm. I can't remember their name. Anyway, we built this little dubbing center over in this Hibbard warehouse. A room about this size. Spent four hundred thousand bucks and started in that business. It languished a long time with little business. Wasn't hurting anything. It might have some potential, and then the half inch machines were introduced in '75 and '76 while all the rest of these disasters were going on. I'll always remember Pfannkuch -- that's the man who runs this operation -- and I went to Japan to see the half inch machines before they were released for production to see if they were real. I talked to both Sony and JVC, which is the VHS camp, and got a half-baked agreement from JVC....

Q Japan Victor.

A No. We went to Matsushita, which is sixty percent owner of JVC first. That's Panasonic in this county. I met the old man Matsushita, and he wanted to talk about video. That was it, and he later on paid a

return visit here. I'll never forget all those black limousines pulling up at the building -- heavy breathing Japanese oldsters is coming out. We laid on for them, simply as a favor at the time, the potential home video market in the United States, so he did the RCA deal.

VHS won. We went back, had an agreement with him via JVC to make the cassette. So we then peddled our wares to Hollywood. At that time, I was on the Twentieth Century Fox board when it was still a public company.

Q Who was running it?

A Dennis Stanfield. I was there at the end of the Darrell Zanuck regime followed by Dennis Stanfield, Zanuck being the last of the big moguls -- a character, to say the least. To my friends in Hollywood, I went around and convinced a few of them to give us a few titles to dub. The argument not being for or against video tape for the home so much as it was going to be the era of the video disc. Do you remember that?

Q Oh, yes.

A Except that disc wasn't quite ready, "So, in the meantime guys, how about giving us a few titles. We'll dub 'em for you, and you distribute them." So we got a few titles from Twentieth, we got a few from Universal, a few from Warner, and I think we might have got one or two from Disney. So we added the half inch machine, we enlarged the room a little bit, and, of course, you know what happened then. It became history. Today, we own forty percent of the world market. We have four plants.

And along the way, we decided to go into the cassette. We manufacture our own cassettes, and then we dub them, and package them and distribute them. We will do -- last year -- 1985 -- we did twenty

million pre-recorded cassettes -- about forty percent of the market -- and about the same number of blanks, which were sold by Memorex and Tandy. We do theirs. So that's a roaring success. We'll do -- I don't know what we're going to do this year -- we think we'll double it.

Q Do you have a partner?

A We have two partners. We started out alone, then we decided that half a big loaf is better than all the little ones, so we've taken somebody for base load -- it's a volume business. So we went around. This is 1979 now, and we went around and visited all the majors, and Columbia -- then an independent company -- decided that that was for them. So we split the thing fifty/fifty. Life went on, the business exploded, we started to build more plants. In the meantime, we picked up Paramount as a major customer, so Paramount in 1981 or '82 said, "Gee, we are thirty percent of your business, and we think for all that we ought to have some equity," and we said, "Yes, sir. You've got thirty percent of the business." So now it's thirty Parmount, and thirty Columbia, and forty percent Bell & Howell.

Q Both of them have great backlists?

A So they represent now fifty percent of the total, roughly distributed through all kinds of other people. Although, last year thirty-five percent of our business was non-Hollywood, which is a great development. Our biggest seller last year was not a movie, it was the Golden Book series for children. We made four and a half million of those things for Christmas last year, and we will probably do twice that this year.

Q Who produced that for you?

A Who did it?

Q Was it in-house?

A That's Western Publishing, and then they gave us the raw tape. They did most of their own shooting. We edited and dubbed it for 'em, packaged it, and sent it out. We do some teleproduction, but, frankly, we don't like to do the teleproduction.

Q You don't really want to get into television?

A There's no money in it. It's a mom and pop boutique business. It's for the company out here doing the commercials. That's their business. I know that business too well. I want the mass-production, high-volume, technical business. And, of course, we have many generations of technical development. How you put that signal on a piece of tape today is very high-tech knowledge. It's not done with a recorder and a cassette any more. That's passe. That's for mom and pops.

Q You've only got about one real competitor, CBS-Fox Video?

A That's right, and they are fading fast. In fact, we'll probably buy them out this year. They're up for sale. In fact, our biggest problem now is if we keep growing very much, we'll probably not be able to acquire very much because we'll get Feds after us on anti-trust. We'll own half the market. So that's the video story.

Q Let's not leave that. That's an incredible success story. You very modestly ran over the outline of that. How did you hook him back on it? How did you do it? A combination of luck, and skill and foresight, and being in the right place at the right time?

A Believe it or not, the story has almost no luck in it. We started in '72. It was clearly a serious business by '81, so over a period of nine years, we probably made half a dozen serious decisions correctly. I suppose that, in itself, has got an element of luck to make that number.

We did a number of things from the beginning. First of all, we

decided to get in early without any clear idea that it would ever be big, but we would get in early on the industrial side, like the Ford account. That was the correct thing to do because we knew, before anybody else did, the elements of what to do, in terms of the making and distribution of software. Secondly, knowing we were failing in the hardware side with those unsuccessful joint ventures, we knew that -- this was a bit of luck here -- the only choice we had at that point was to get in the software business. Little did we know that, in the long run, that's the better choice than the hardware business. To give you an example, currently -- 1986 -- the average homeowner will buy or rent more software than it costs to buy his machine. So you can guess which side of that equation you'd rather be on. You'd have to say by luck we failed on the machine side, so we took the software side as the only thing available. It turned out it was the right thing to do, but that's the lucky part.

The other thing is that from the beginning, we supported the VHS for an odd reason, which helped make the VHS the dominant format. There had to be a winner between Sony and Matushita, and we picked the right one. But on the simplest of bases, and that is that the original Sony Betamax was only one hour per side; with the Matushita machine, it was two hours, and we figured it was going to be a movie business. Sony figured it was going to be a time shift business, and having come out of Hollywood and being in Hollywood, I said, "No. It's going to be a home entertainment business." Time shift is nice, but that's not going to drive it.

Q What do you mean by time shift?

A The taxi driver works at night, so he records at night and plays when he wakes up in the morning. And, by the way, that was the Japanese

idea, too. The Japanese had no use for what we were doing for years and years and years. It's only been the last year the Japanese have finally figured out that what we've been doing out here in North Brook and now on the West Coast, Mexico, London -- about to be Tokyo -- is really the driver of their machine. They thought it was a time shift business. And to this day, the principal use in Japan was time shift. They don't buy a lot of movies.

Q I wonder how they missed the boat on that one?

A No. The Japanese think more of their television than we do. That is, the network television. That's one major reason.

Q You made the right decision that television wasn't going to [completely dominate] the home entertainment market?

A That's right. Then the other thing is -- and we actually designed and were ready to construct a video disc plant -- and at the last moment I said no to video disc. We were going to do it jointly with the Phillips Company out of Einhoven. And for a lot of complicated reasons we ended up not doing it. So we made all our bets on tape and never did really think a lot of the video record business because you couldn't record.

How I learned that "it couldn't record" lesson! I learned it right off that damned station wagon. I'll tell you how I learned that lesson.

Q It was the '65 Ford station wagon?

A Yes. People bought that wagon, and they used one version or the other but never the other, but they knew they could do it either way. They were never sure, but they had it, and they bought it because they might want it.

Q Your decision here was flexibility?

A The other thing about the video disc was you couldn't record, and, by the way, we've run surveys -- now we're a big factor in the business -- seventy percent of the homeowners who have bought these video [machines] don't know how to run the record button. The kids run it for 'em, but they bought it. They won't buy it if it doesn't have it. It's an old marketing concept, as my story about the station wagon. So we kept saying, "That isn't going to go." And the video disc, of course, turned out to be several billion dollars of red ink for all the players, and we just sat there and we kept asking, "Do they know something we don't know?" And we'd go back over the thing over and over again over the years, and finally we concluded each time, they don't know what they're doing, so we kept building more tape plants.

Q What happened to [the Phillips joint venture]?

A At the last minute I got cold feet. What I did was say to the Phillips people, "Look, I think this is questionable, guys, but I'll tell you what, we'll proceed if you'll give us, separately, the rights of the business data disc." "Oh, no." I said, "Well, okay, guys. I don't want to take the risk over here unless you give me this as a compensatory proposition." That's what I wanted. We'll get the rights some other way, but that was the end of that. That was the closest thing to video discs. That's how we got there.

In the meantime, we got rid of all this junk in the company and picked the video software business as a major business direction. Then we took a tiny business which we had when I came here which made automatic mail handling equipment. This is the kind of equipment you'd find in mailing rooms of the big utilities -- the big mailers. It turned out to be a winner in big business today.

This tiny business exploded in the 'Seventies because the post office system became a semi-private corporation. You may remember that in the mid-'Seventies, they had to make their nut. They had terrible labor costs, and there were other problems, so they adopted a policy at the postal governor's level of offering tariff discounts for presorted mail. Most big mailers don't pay 22 cents for their stamp, they pay 18 cents. The 4 cents, if you presort mail by zip code, fed the mail machine industry of which we owned eighty percent -- the tiny thing -- because we can make all these presorting systems.

Q You held on to this one?

A Yes. Today it's a two hundred million dollar business.

Q And everything has gone to automatic sorting?

A Sure.

Q Back down in your bailiwick [Dearborn], we've got one of the biggest automated mail sorting warehouses in the business.

A Is it a postal one?

Q Yes. U.S. Post Office.

A It's probably got a lot of our equipment in it. We sell to the post office sometimes, but we sell mostly to private customers -- to the big mailers -- utilities. The bulk of the mail in the United States is transaction documents -- your bills. There are two kinds of mail that have any volume: catalogs with direct mailers -- retailers -- and your bills. Sixty percent of the United States mail is turnaround documents from business to home and back again, and we have ninety percent of that market. And when you go to a post office central like the regionals, you'll find half their volume is off of our equipment. We worked it out one day. We run a hundred billion pieces of mail a day over our equip-

ment somewhere in the United States. So we dominate the market. It's a niche. A very profitable, very technical niche. You talk about design. This is all sophisticated machinery. Each company wants it differently. They mix and they match. They put different things. They change the envelope -- they address it differently. Everybody's got their own systems, so we have to do all custom engineering.

Q And all this from the little company that you hung on to?

A Yes. Phillipsburg Mailing Machine Company of Phillipsburg, New Jersey, which had been founded in the 'Thirties, and by the time I got here in the early 'Seventies, there was still only ten million dollars a year. A small company. Today, it's a large company.

We did that one, and then we took the remnants of the Devry Correspondence School system. They had several day schools. I said as an afterthought one night, "Let's keep the day school." We had to get rid of the correspondence school business. It was hopeless, but that was the bulk of the business. So we kept these little day schools. They weren't even making any money at that time. We kept them and grew them. Today we have eleven campuses, and we have thirty thousand students in the day system. We have something like five thousand graduates a year, of which half have got their science degree in engineering which is fully accredited -- the only private proprietary school ever accredited by the accrediting agency. We could truly say we have the same engineering accreditation as MIT -- same group -- same accreditation process.

Q Are these inter-scholastic, technical schools?

A They're post-high school. Four year baccalaureate degree in computer science -- two curriculums: computer science and electric engineering -- BSEE and BSCS. So that's big business.

Then the third other piece of the business is the -- what started out when I got here -- again a small business -- making microfilm records of documents -- microfilm equipment. That's grown to be a big business and is undergoing a technological transformation, very similar to the one that went from film to video. It'll go more slowly, but it'll go from film to digital disks -- later to the documents. And that's big business.

Q Storage?

A Storage as well as active records. It's the West Coast division that makes -- when you buy on your American Express card, you sign a sales chip -- sales draft. Those flood into centers. They have to be processed and data entered to reach your bill and pay the merchant. All that processing is done on our equipment. A very high-speed data entry equipment. Very sophisticated. All computer-driven. So that's our other big business -- document handling.

Ranging from archival storage to processing sales drafts, that whole gamut of paper-based -- we call them the paper mills, and there are a lot of paper mills going.

Q Are they laser disks?

A All laser disks. They're digital with a laser that lays down digits. They are digitalized images. It's all digital electronics. The bulk of it is still on microfilm or paper, but the laser digital disk is starting to come in now, as well as the ability to display the images of documents. It's a very high resolution on a CRT. That's another part of it, as well as the ability to transmit this stuff so you can move documents around.

Q It's just beginning to explode?

A Yes. So that technical revolution will occupy the rest of this

decade, just as the video revolution occupied the 'Seventies. So we're in another technical revolution in the digital document storage and transmission business. So that's starting in now.

Q That's an incredible story, and it's not finished yet, obviously.

A And my participation in it really started all the way back to that Uncle Sam's training course in the Bell Labs in the Battery [NYC] in 1943. It was my first exposure to computing power, electronics, modern... Of course, it was vacuum tubes in those days. That was even before the transistor was invented. So by the luck of the draw, I got exposed to this communication information industry very early. I was trained before the computer age, but I knew the computer back to the days of ENIAC and the Sperry Company and George Van Neuman and that whole crowd who were all the pioneers, some of whom I was exposed to as this young officer/student. So it was the luck of the draw. The digital system has never given me any fears, at least only by virtue of having seen something about it.

In the 'Forties, of course, it was mostly analog, but once you understood the analog process, digital processing was a natural following. So, by the luck of the draw, I got into that act very very early as a young brand new second lieutenant. Now you know more about my personal career than I've even thought about in years.

Q What about the old bread and butter Bell and Howell projectors -- -- the things that we knew in our grade schools?

A Would you believe we're about to close up the business?

Q Are you?

A Yes. It's just about finished. It's just no longer relevant to

the world. It's all video and the 16mm projector in the classroom. We're just about at the point where we can no longer afford to make 'em.

Q How about the cameras? Did you get into that?

A They're all video now, and we missed that boat.

Q How?

A Frankly, it was my predecessors. They were in the video design and development era in the 'Sixties, and Pete didn't stay with it. I'm not even sure why, because we were a pioneer in video recordings. We still have in the archives some very early video recording equipment, but he didn't stay with it. By the time I got here, it was too late, so I had to take the software side, which may turn out, in the long run, to have been the better decision, but they didn't know it at the time. So, at least, we have a play, but we're in the software side. I'd like to have both, but up through the 'Seventies, the company was receiving royalties from the Japanese companies of that day -- Sony -- and from patents we owned on modulation of signals for video recording. We had done research. We had patents in the field, but we didn't pursue it.

And I suspect what happened was that Pete had different objectives on content earnings growth, and it was a heavy R and D cost, so he just killed it -- the story of much of America these days. So, I think that's what happened, so we missed the hardware side, but we certainly have a fine business in the software side.

By the way, we make a cassette over here at North Brook, and now in Garden Grove, California, and Tijuana, Mexico, to name three plants. We make that cassette for less than the Japanese can, so it can be done. You just have to work at it. You've got to invest, keep the latest technology always in your plant, don't fail -- if something new comes

along, scrap up and don't get behind. It can be done. In fact, we built this whole North Brook plant, which is our first highly-automated cassette plant. Not the signal process, but the cassette maker, we built that with American automation equipment. In fact, the guy I was just talking to, we use his injection molding press. We've got twenty-four 375 ton injection molding presses. It looks like battleship row. It's a block long. They're making ten thousand cassettes an hour going twenty-four hours a day, seven days a week. That's a lot of molding, like popcorn. We have something like five direct laborers. It's fully automatic.

Q Who are your principal brand outlets?

A Memorex and Tandy -- that's Radio Shack. There are four principal brands: Maxell, 3-M, Tandy, and Memorex. We make two of the four. Maxell is Matushita, and 3-M is 3-M. Those are the four principal brand names. And, frankly, I don't remember any more -- I haven't looked in years -- what the market shares are. Frankly, the blank cassette business for us is less important than the pre-recorded. That's much more the valuable end of the business. And it keeps my hand in my old Hollywood days.

Q How long were on the Twentieth Century board?

A Oh, golly, ten years.

Q Some interesting tales?

A We could spend the rest of the afternoon talking about Hollywood and all the experiences I had. I'll tell you, that's some era. That's some scene.

Q Have you been watching [Marvin] Davis' peccadillos in the last few years at Twentieth Century?

A I watched it go down the tubes is what I watched. Now [Rupert] Murdock has bought it. I suspect Murdock can do something with it. I think he's much the smarter -- much more experienced media man. I'm not sure he's going to spend all his time making feature-length movies, but he is sure going to make television. Davis, I don't think ever understood the business. I really don't think he did. He's an oil wildcatter.

Q Thought he could do the same thing with the movie business?

A I don't think he quite got the difference. For one thing, you've got a lot of prima donna types to deal with in making movies. In wildcatting, you pay your geologists well and hope they're right, but that's a different ball game. It may be risk money, but the players are different, and I don't think he understood that.

Q Were you there in the young Zanuck era?

A Oh, sure. David Brown and young Darryl Zanuck, Jr. sure. They were around. In fact I was there the day it happened at a board meeting in which Darryl, Sr. -- not Darryl Zanuck, it was young Zanuck -- called him Richard -- threw out Richard. Darryl had made Richard president, and I'd just gotten on the board, and he announced one day he'd fired him. I was new, and I said, "President." "Yes." "That's your son, isn't it?" "Yeah." "You fired him?" And the rest of the group picked up the cudgels, so I kind of sat back. I realized it was something different.

But the funniest event that I ever saw with him is he got mixed up with a bimbo named Genevieve Gillot and made the mistake of making a movie with her. In the latter days of his career at Twentieth, some share-holder sued him for misappropriation of the fund's assets -- spending the shareholders' funds in making this movie with the bimbo.

The movie was terrible. I've forgot its name. It was an awful movie. She could not act. Apparently other things she could do, but not act.

Then at the same time, he got another shareholder suit on misappropriation of assets -- it might have been the same shareholder; I don't remember any more -- on his expense accounts, because he lived high, wide and handsome. He was the last of the big spenders. So there was nothing we could do as a board of directors but appoint an independent committee of the board, which hired an independent public monitor to audit the books. The audit went on for six months, and finally the day comes. The audit group comes in -- let's say it was Price Waterhouse -- and announced the findings of the audit in front of the full board. By this time, Darryl had been moved off of chief executive, and a guy named Bill Gossett, retired from Ford Motor Company, whose real secret life was as a principal legal officer in the movie profession. Most people at Ford never knew that, so he's made chairman pro tem of Twentieth Century Fox which Darryl steps down during the audit. The audit is presented, and the whole thing comes down to the auditors saying that Darryl Zanuck owed the company four hundred thousand bucks for improperly reimbursed expenditures.

We're in the midst of this, he's got his cigar -- I can see him yet -- tears in his voice, this great company "he'd given his life to...." And then William Randolph Hearst, Jr. was then on that board -- apparently his old buddy -- leaned across the table and said, "Darryl, you've had four hundred thousand dollars worth of good screwing, go pay the money." And just at that moment -- and, oh, the other thing, we were going to have to collect some money, the auditors said, from Genevieve Gillot, and she had been informed. At that moment -- this was at the old

Fox studio on Sixth Avenue -- the big oak doors fling open, and she walks in the room. The guards are trailing after her trying to...and she's there denouncing the board, crying and screaming how could we do this to her reputation? And I said to Bill, "Where are the camera crews? This is better stuff than you're making in movies!" It was terrific. I sat there just absolutely enthralled with the whole scene.

Finally, the guards dragged her out the door, and Darryl said, "I'll pay the four hundred thousand dollars." It was shortly thereafter Darryl got quite sick and lived for about four or five years, and he made up with Mrs. Zanuck. I never knew there was still a Mrs. Zanuck around.

Q Virginia.

A Virginia. And they got back together, and he died happily with her. And I think with the whole thing with us -- revealing the whole thing -- paying the money back -- he probably figured he might as well go back to Virginia and enjoy his remaining years and give up all this crap.

Q She was a long-suffering Hollywood wife.

A She had to be. In the meantime, I don't think he wanted any more of Genevieve, so she was dragged off, and I think that's the last time I ever saw her. So I saw the ending of it all, and I always thought, gee, where was the crew?

Q A typical Hollywood ending?

A We could have had a marvelous -- a real "Executive Suite," only with the real players. It was fascinating. That was my introduction to the movie business and had a marvelous time with that.

Q Who took over after Darryl left?

A A guy named Gordon Stulberg, who I thought was very good, but he

and Bill Gossett, who'd stepped down from pro tem, being one of the powers....

Q Was Gossett still at the company by this time?

A With Ford? No, no. He'd retired from Ford. He retired at the time Arjay [Miller] was made president by Henry, and Henry told Bill he'd have to report to Arjay, and Bill thought that was a comedown. Never had much use for Arjay. They were not compatible characters, to say the least. So Bill up and quits, takes early retirement, and went back to his law practice, which was one of the principal legal firms for Hollywood. Nobody ever knew that. I didn't. Nobody knew it.

In fact, I got on the Twentieth Century board in New York while at the Cable Company. The phone rings, and it's Bill one day and said he'd like to see me. We had lunch, and he said, "Would you like to become a member of the Twentieth Century Fox Film Corporation of which I'm a director, and I've been empowered to look for some new directors and young blood because we need new fresh thinking. I said, "You said about three things, Bill, I don't understand. First of all, you're involved. Secondly, I don't know anything about the movies, and how in the hell did you pick me? All I know is I pay my four dollars to go a movie on Saturday night sometimes." He said, "Nobody else does," except he named a few members of the company on the board -- not many -- Darryl was one. So that was the start of my Hollywood career. It was fascinating.

Then we went from Darryl, to Bill, to Gordon Stulberg, and from Gordon Stulberg to a guy named Dennis Stanfield, who turned out to be a real coo-coo. He was flaky, but deep-hidden -- very deep. He precipitated a private offer, which blew up, and Marvin Davis, who was kind of futzing around to get in the movie business, saw all this blow up. Of

course, when you put a company in play like having a sale to take it private, it puts the company in play, so Davis moved right in and bought the whole thing up.

Q Do you remember the abortive Monroe movie shortly, I think, after Zanuck left? A Marilyn Monroe movie?

A Was that a Twentieth Century Fox movie?

Q Yes.

A The one I remember most clearly was the onc he left us with is Cleopatra with Elizabeth Taylor. That cost us a bundle.

Q That was a [Joe] Mankiewicz enterprise?

A Yes. That was a Fox movie, and that cost us, I don't know, fifteen million bucks to go through that thing -- a bomb. Then we got back together with Zanuck and Brown, and they made some great stuff: "The Sting;" "Hopalong Cassidy and the Sundance Kid." They're great movies. Just made money. And delightful movies. They were fun movies.

Then that kind of fell apart under Dennis, and now they're back with -- I guess they just signed a deal with one of -- the two are apart now, and something was done just recently by Murdoc. I think it was with Brown.

But I was there during the period of -- well, we started off with what's his name? "The Poseidon Adventure," "The Towering Inferno," and then bango!

Q Irving Allen?

A Irving Allen, and then, bango, we hit on "Starwars." That was the movie I'll always remember.

Q Is that Zanuck/Brown?

A No. That was George Lucas.

Q Weren't they the packagers on that?

A No. Lucas did his deal with a guy named Alan Ladd, Jr. Lucas was producer.

Q That's the one.

A I see Alan every once in awhile. We're good friends. But I always remember the history of that movie. Talk about prophetic. That movie was goddamned near thrown out by the board four times. It's almost like the Mustang when you think of it. It kept overrunning. Alan was the only one that could ever -- George Lucas is almost inarticulate -- explain "This guy came in to see me. He's got this movie for shoot 'em up in the sky. I think it makes sense." And somebody else said, "Sci fi never works." It was a science fiction. So he conned the board into, I think it was four million bucks. A big deal. Every board meeting thereafter, "Guys, it's four and a half million; now it's five; now it's five and a half; now it's six." It got up to eight million. I think we spent an hour the last time. It was in the can. It was another half million -- it was eight million something. The final number. The rough negative was in the can.

And then it disappeared, and, finally, a couple board members were invited to come out and see the first rushes on "Star Wars." My eyes are getting bigger, and bigger, and bigger, and Darth Vader is all there and all those characters. Then Alan Ladd, Jr., whose career is on the line on the thing, is standing in this little viewing theater for the brass on the Fox property. He's standing at the door, and we're filing out, asking each one of us what we thought. Well, it pays to have a raw view, because I roughly was that -- there was only about half a dozen of us

there that night. So and so said, "Well, I don't think it will amount to anything." Somebody else said, "Well, it's kid's stuff." So he turned to me, and he said, "What do you think." I said, "I'd like to see that movie again." Those were my exact words. "I'd like to see that movie again." It turned out, I saw it nine more times. "I'd like to see that movie again. It kind of intrigued me." Of course, what happened then is history.

The big fight thereafter was once George Lucas understood that he had made with the "Return of the Jedi" and "The Empire Strikes Back" -- great successes. Each time the distribution rights got worse, and worse, and worse, and finally Dennis Stanfield blew it up. Of course, Dennis never could really figure out how to handle George. It takes a swift hand. He and his wife, Marcie, eventually got divorced. I remember one night at a dinner party, and I was at the table with George Lucas on one side and his wife, Marcie, on the other. George came for a heavy breather dinner party, and he's worth millions and millions, and he came in a pair of blue jeans. His wife came in a J.C. Penney cotton dress off the rack. And, by the way, she was a leading Hollywood editor, in her own right. She was a first-rate professional.

Q Did she help with the films?

A Oh, yes. She edited the first film.

Q Editing was a very important part of it?

A Oh, of course. She was the major part of that thing. George never said a word all night. Marcia -- Patty was Alan Ladd's wife. That's another whole story. Marcia never stopped talking, so I realized she did all the talking for both of them. She was a delight.

And then Dennis fell out with Alan Ladd, Jr. Alan had done something, and Dennis was a Naval Academy graduate, and he thought everyone walked on the quarter deck every morning at shape up time. Alan did something. We had a long-standing dinner with Alan one night, and it happened to be the night he'd quit. So the dinner was a mixture of crying, and a wake, and a new life, and so forth. We had dinner at Chasens, one of the watering holes for film people, and everybody was coming up all during the dinner, either congratulating him or condolences about he'd quit, and he was going to go off and do his own thing. He founded Green Tree, I think.

Made a five picture deal with Warner that didn't work. His last movie was "The Right Stuff," which I thought was an excellent movie, but that was a movie for the wrong generation. The kids -- the bulk of the movie is for seventeen to twenty-two years olds, and they didn't give a damn.

Q They read the book, but they didn't see the movie.

A No. I thought it was an excellent movie. Very finely crafted Alan Ladd type of movie. I don't know what he's doing now. The deal with Warners fell apart, or it was terminated. Alan is doing something else. He's got another deal. Frankly, I've lost track of him. The next time I'm out there, I've got to call him up.

Q Are you still on the board?

A No. They went private.

Q When Davis took over?

A It went private, and I'm trying to think what happened. I remember concluding that a private board doesn't have any meaning, so I left. Besides, I'd done my stint. I'd seen Hollywood. I understood a little

bit about it. Hollywood is all right for awhile. It's not my thing in the long run. But I enjoyed the period. It's invaluable experience that I had to understand some of how the movies get made and they're financed. They're unbelievable characters. The egos I saw! Unbelievable people. Outrageous behavior. I remember we'd done a movie with Liza Minnelli, and she came to a party we gave. I remember vaguely the whole scene. She was higher than a kite; I assume on coke. I don't know what she did.

Q She's since kicked it.

A God, it was pitiful. There was all that talent absolutely broken in pieces. She went downhill from then on. I don't think she does much of anything right now.

Q She's recovered. She went on to the Betty Ford clinic.

A Did she finally break it?

Q Yes.

A I don't think you go through that and break yourself and come out the same way. And this was not too long after she made that absolute masterpiece of hers, "Cabaret". That was with Joel Grey. I thought that was a masterpiece. And she was in her heyday then. This was after that. She was already downhill. I felt very bad. Why? But, I guess, that's an irresistible kind of scene out there. Snort that stuff, or shoot up, or something.

Q It's very hard to stay away from it. Speaking of Lucas, you had the rights to "Star Wars," and you kept them. He decided he didn't want any more of that kind of...?

A No. And finally we sold back the rights to get -- in other words, the deal for the third one is to get a piece of "Star Wars" back to get

anything of the third one, so the whole thing leveled out. That's what finally happened. A long, difficult negotiation. Big fights over the ancillaries, like toys. Success did not breed total happiness in that deal, but it sure saved Twentieth Century Fox. It made the company for a period of time. It was fun to see it go -- to see this thing get bigger and bigger and bigger, and the rentals take in more and more. It finally cracked the hundred million dollar mark.

Q It's the best of the three movies.

A I didn't think the other two quite got there, and I don't think he's going to make any more. I think it's finished in his head.

Q He's doing television movies now.

A Yes. I don't think there's going to be any more. And as far as I'm concerned, you're right, there's only really one, and that was "Star Wars." In fact, for Christmas, I gave the directors four movies. If they had grand kids, I gave them some Golden Books. I gave them a collection of four old-time classics. I gave them "Birth of a Nation." I found the black and white print and dubbed it. I gave them "Gone With the Wind" in the new color reconstruction, which was superbly done.

Q You got that from MGM-UA?

A Yes. We got a reconstructed negative from them, which we did part of. We did a frame-by-frame reconstruction. We helped them on that. I gave them "Citizen Kane." I found a guy with a great negative. It had never been known in New York, and he dubbed that on a disk, and we dubbed it on a tape. And I gave them "Star Wars." I said, "Those are the four great classics of all time." They all loved them.

Q Is your version being distributed by RKO?

A Which one?

Q "Citizen Kane."

A It's not being distributed by anybody. We just did the one print. It's magnificent.

Q It's my favorite movie. We've got a version dubbed from television.

A When Orson [Welles] died, there was a wrap-up in the Times, and it mentioned this guy had found, unexpectedly, an unknown negative, a dupe of the original negative.

Q In the RKO archives?

A It simply said New York, and I got ahold of him, and he said he'd recorded it, and he dubbed it onto a disc. And if I'd send him ninety bucks, he'd give me a disc. So I sent him ninety bucks, gave it to Pfannkuch running this conglomerate over there, and I said, "Make me ten copies for the directors." He said, "Sure." I assume he called the guy and got permission for ten dubs. So, as far as I know, that's just a private deal, but it was a great print. It's a great movie. I ran it off at Christmas time. Sat and watched it all over again and realized that Orson Welles, at one time, was one helluva an actor and director. That was a masterpiece. It's a masterpiece. And nothing ever done like it that he did since.

Q Lots of interesting writing about it. Pauline Kael has done a book on it [Raising Kane].

A Yes, and then there was another book quite recently, which is the other viewpoint. The two took quite opposite approaches.

Q Kael was saying that it was largely Herman Mankiewicz who was the real genius of the script?

A He was the power behind the throne or the genius. I don't believe that, by the way. I think what we saw was Orson Welles. I don't know

why we have to complicate the story. It was just him. He was a kid genius who peaked early. I think it was Orson. If you look at the movie carefully, you can tell it by looking at the movie it's him. He controlled every scene.

Q It's his Mercury Theater group that did all the supporting roles.

A Yes. And look at his control of the scenes. There was no Mankewitz with puppet strings, it's him. And I watched it, because I hadn't read the books, but I read the reviews of the new book and the Kael book -- that's the New Yorker writer. Sometimes her reviews are way off the mark.

Q Strange but exciting to read?

A Very, and sells books. So I watched the movie with unusual care. I'd seen it many times before, and I think I said to whoever was with me at the time, "That's Orson. Look at the way he controls scenes. Him." The only time there was another in my judgment as, let's say, an advanced amateur at best, was the scenes of his Man Friday. What was his name? He became a fairly good actor in his own right.

Q Joseph Cotten?

A Yeah. Now he had scene control there in a couple of scenes, but that's the only alternative, and Cotton had nothing to do with Mankiewicz either, except as another guy. But that scene in the garden where he's in the nursing home, and he's reminiscing...?

Q With the reporter?

A Yeah.

Q He says, "Young man, you wouldn't happen to have a cigar on your?

A That's right, that's the scene. And I don't think Joseph Cotten did a lot better than that either in his subsequent films.

Q He had a good [lead role] in Orson's second film, which was "The Magnificent Ambersons."

A I never saw that film.

Q But it was all chopped up.

A I understand somebody's trying to put that thing together again. Have you heard about that?

Q They've got the ending. What happened was that RKO broke with Welles and kicked him off the film, and they got Robert Wise, who was their film cutter, for an editor to cut the film, and he chopped it to pieces, and he chopped off the ending, added a perfectly spurious ending. Then in the last showing on cable, where we dubbed it, they showed the original ending, which was marvelously done.

A That's what I've heard. They found the stuff on the floor, and somebody either has or is going to do a reconstruction, at least closer to what Welles had in mind. I'd like to see that. I've never seen anything of it. I just missed it.

Q You'll love it.

A I suppose for the next....

Q Joseph Cotten is very good.

A Is he? So he played again with him? I didn't know that.

Q Yes. The Mercury Theater people stayed together -- Agnes Morehead -- they all became character actors. It was his old Mercury Theater group from New York.

A Okay. I didn't quite connect it, and I didn't realize Joseph Cotten was in that.

Q Back to Bell and Howell. This is a superb success story on your part. You went over it rather quickly, but reading between the lines,

you've done a fantastic job here at Bell & Howell.

A We got the company back.

Q You certainly have.

A I'm on my way out. I retire in two years. I'm sixty-three next month.

Q Is it mandatory?

A Yes, and it should be. I've been here seventeen years. It's long enough. Time to change. Things change.

Q You look like you're in good health.

A Fine health. I don't know what I'm going to do, but I'll do something. I'm going to teach.

Q That's what I wanted to hear. One last question about Bell and Howell in the few minutes left. Tell me a little bit about the magnetic tape business. How did you decide to get out of that?

A When I came to the company, one of the many little pieces around the place was a company called Green Tree, which made magnetic tape for the then audio tape business. Video, at that time, was a specialty bit for studios -- the one inch, Ampex, quad -- that type of stuff. And the company had bought this little cassette business -- blanks -- and they were a minor player. They just weren't big enough, and in demand enough, and we were losing money. We should never have bought it in the first place, unless we were going to get to be big time. So I got out of it. In the meantime, Ampex had entered the business, both as a tape maker and as a pre-recorder. They got in the popular music business. And, of course, that was a mistake on their part. And they started giving front ends that were new in the industry.

Q What do you mean by front end?

A Prepaid royalties to the artists. And you start to guess wrong, and you've got yourself big bucks that aren't coming back. They finally took the bath and wrote it off. I saw all this going on, plus we had done a little tiny of pre-recorded stuff, and we were building this tape plant, so I said, "That's not for us." I suppose if I had the perfect world, I wouldn't have done it, and that would have folded into what we finally ended up on the video side. But, even to this day, we don't make raw tape.

Q Not even video tape?

A We buy it. It's a commodity. We use ten percent of the free world's tape every day. We're the largest consumer of raw tape -- we buy it in big rolls -- in the world. We've got all the people who fight over a penny a thousand feet for us. TDK -- that's Japanese -- Maxell, 3-M. Now the Koreans are on it: Samsung.

Q You felt that the recorded tape business -- raw tape -- was a dead end?

A The capital investment is enormous. You can't produce a minimum module investment. For a tape coating line it is forty million dollars now. We would chew up -- we use the equivalent of ten lines a day, so that would be a four hundred million dollar investment. So we buy it. Plus the fact, it's a commodity business today. It didn't start out that way, but the world's capacity has come along, and everybody seems to cut each other up. So you can buy it. The standard unit of purchase of raw tape is the half-inch width slip. A two hour cassette is eight hundred feet, so the pricing unit is eight hundred feet. Or for hundred feet you use eight units. In twenty-four months the price of raw tape -- video grade, top specs -- has gone from forty-two cents a hundred feet to nine-

teen cents. It's less than half, and it's still dropping. The economics of that business is a lot like paper making. In fact, they're similar mills. And paper is a boom and bust business, and so is raw video tape. The making of the cassette, dubbing of it, packaging, and distribution, that's a different ballgame. There are very few players in that game of any size and number.

Q You've done a fantastic job at Bell & Howell. I'm fascinated by the fact that you've never forgotten that you were an assistant professor, obviously. How did that come about in the years after you left the University of Michigan?

A More a case of just keeping track of academic things. I always had a fondness for the academic world. I always felt somewhere in the back of my head I'd get back to it. And I got seriously started when I came back to Chicago in the early 'Seventies. I started lecturing at the U of C business school. I have given a lecture down there for the last fifteen years.

Q Is that the main campus?

A No. The evening course for the older MBA students is on the corner of Walton and Michigan Avenue.

Then four or five years ago we had one of the professors from the School of Industrial Management for Northwestern appear at one of our management conferences, and he came as a speaker. We got to know each other. His name is Albert Rubenstein, and one day I had lunch with him. I said, "Some day I'm going to go back and teach." And he said, "Do you want to start now?" I said, "What do you mean, start now?" He said, "Why don't you let me set you up and see if I can get you an appointment as an adjunct professor? Would you like to teach a course in something?"

I said, "Innovation. That's where I've lived my life and career." And I'm now teaching it for the third time --this Winter term -- at Northwestern. That's seventeen students. These are master's degree students. This is not the Kellogg School. There are two management schools at Northwestern. Kellogg is the big one, and there's a School of Industrial Management, which is much more technical. That's the small one. I teach in the small one.

Q Where are they located?

A Right over here in Evanston. Northwestern's campus is on the lake. I teach in the Tech Center, main campus. And lo and behold while I'm teaching, they change presidents -- Arnold Webber -- whom I happen to know. MIT, Carnegie Tech, Colorado, now here. So he comes in, we meet, we talk. In the meantime, the faculty thinks well enough of me. I'm put on the first doctoral committee, which is a switch. I'm now on the other side of the table. I can remember, like yesterday, being over on the poor student's side.

And the next thing I know, they're changing deans in the engineering school, and, in true university tradition, they appointed a select faculty committee to be the search committee for a new dean. But under Northwestern's rule, there are ten members on the committee. Eight are elected by the faculty at large and turn out to be heavy senior professors, and two were appointed by the President. And I'm a Presidential appointee to the dean search committee. The other outsider doesn't show up -- he's disappeared -- so I'm the outsider, and that was a funny experience, because this is the heartland of internal politics at the university -- the dean and these committees. An outsider there is barely tolerated, so the first five, or six, or seven meetings -- not to mention

the fact that I was considered the "President's Boy" -- a genteel form of spy, let's say. This has been going on, and we'll finish next month, and this will be the ninth month. We've interviewed a group of fifty candidates or something like that. It's an extensive process. But over the months, I've finally become accepted, and now I'm a member of the group. In fact, I just talked to this guy while you were here today to get him to come out.

Q Is he one of the candidates?

A Yes. He wouldn't answer. Auchenbach -- that's the chairman of the committee -- said, "You try to get him. Maybe he'll answer you." Then I got the job done. Got ahold of him. He's coming out. In fact, last night we all sat out at the Szechuan Pavilion out here, and we're going through the last of the candidates -- one of the last candidates. We sat around drinking beer half the night like a bunch of undergraduates. Most college professors still have a certain sophomoric content to them to a degree.

But my great scheme -- see, there's a grand plan in all of this. But it requires two big hurdles to get over. That is, I've go to do two things. First of all, I want the company to be well enough off and secure enough so that when I retire -- two annual meetings from now -- that the company will see fit to endow a chair. We'll call it the Bell & Howell Chair for Information Science. Now to get the million dollars out of the board of the directors freely, that's the first hurdle. But the second hurdle is even worse. That is to convince the recipient of the chair -- let's assume Northwestern -- as a pre-condition, they'll accept me to occupy it. That may sound silly, but that is an absolute violation of the hallowed rules of a university. The university normally accepts a

chair only on the basis they have the unilateral right to appoint whomever they wish. So that's the second hurdle.

Q That's going to be your biggest challenge.

A My theory of all of this is I've got to be accepted. Well, of course, I thought of it already. Whatever, see? I've got to get that all done before I get to this. So this is all part of the master plan.

Q Since this tape will be listened to long after this is an accomplished fact, how do you propose to pull this off?

A I propose to pull it off very simply. Have some representative of the board -- representing me and the company and the million bucks -- just go over to the powers that be and ask them. But behind that will have to be the quick check back to the faculty, which is a violation of every hallowed....and the whole theory of this is, "Well, he's already a member of the faculty." So what? So that's the theory. But, in the meantime, I've got to build this up. It's like being responsible for everything, authority for nothing type guy in the Ford Motor Company. It's the same goddamned thing. I have a feeling its deja vu. I've got to work out to the position of credibility and acceptance there with no leverage.

Q But this time you're not selling cars, you're selling something entirely different?

A It's different. But as you can probably tell, I've been a teacher all my life.

Q Yes. I suspect you're very good.

A I just get a kick. As late as yesterday, something happened that I haven't appreciated for thirty years. This happened to me over and over again in my former life as a teacher, and it's happening now. You'll

spend half the semester, and you talk to the students with passive faces. You wonder if they learn. Is anything getting through? And all of a sudden -- and yesterday was this case about the plastic can, which is a first-rate piece of entrepreneurship in a large company. This guy got them to put up the money and do all that. And, all of a sudden at the end of his case lecture, I got up and finished the piece of the last lecture I hadn't finished. And then they started discussing the case they'd heard as it related to the content of the course. "Well, did you see what he did with what we were talking about two lessons ago?" And all of sudden, one of the students got up and asked the right question, and I said, "Son of a gun, I got through to one." He's finally into it. He's getting it. And then you realize that's what the teachers [live for] -- you finally get one who's got it. You finally got through. The real test is he or she will ask the right question or make the right observation, but only as they will do it. You can't -- it's not parroting -- if they do. Ground it all up, and out comes exactly the right question.

Q That makes it all worthwhile?

A And it's at that point, you say, "Well, I got one. Left one behind that got it." What you're trying to teach.

Q I want to ask you about your technical entrepreneurship inside and outside the company. That sounds fascinating.

A I think it's the most seminal thing they could do right now at the university because -- in fact, another good friend of mine is John Silver, who is President of Boston University. He's the famous maverick. I had a connection through a board member, who's since died, to BU, and I was by seeing John in Boston recently, and we were talking, and something came up. He said, "You know, why don't you come out and spend three or

four days on our account at Phoenix with our annual meeting of the trustees? Be my guest. And for that, would you make some comments? Would you give a little speech to trustees along the lines of some of this stuff?" I said, "For four days in the sun at Phoenix in January in Chicago, hell yes, I'll pay my own way."

So I did. And in preparing for that speech, I didn't realize until I did, you have to write something that consolidates the mind. This is, for instance, one of the great guides of learning how to write -- which every engineer does painfully -- most engineers other than Leon Jaroff. So I realized the case to be made here. Do you remember the name Vannevar Bush? I started my talk to the trustees about economic policy. An officer just out of the Army and all that, going back to the university and trying to decide what to do with my life. I had read Vannevar Bush's piece called "Science in this Frontier." It had a profound effect on me, and I picked it up recently and reread it. This is forty years later. I was out of the Army in '46, and the piece was published in '45, the year I got out that I read it. It, no doubt, had a big influence on what I then chose, at least as an immediate career. But I reread it, and I realized that time had gone by, and the premises of Bush's comments had become 180° wrong. In there he points out one thing that I think for the passage of retrospection, he missed --and the other thing he was wrong on. He said, first of all, any country who wants to be a world economic power, must command the world's basic science. Japan hasn't commanded anybody's basic science, so that's -- but then he said in another part of his paper -- he had it right, but he didn't put it to the first point. He said America grew great in the nineteenth century in the era of mechanical arts and crafts on European science, arts and crafts. That's true.

And all Japan is doing is doing to us today is what we did to Europe a century earlier.

Now between the two centuries, the amount of science-based technology is far greater than it was in the nineteenth, which was Newtonian mechanics, and that was about the end of it with some higher mathematics. Today, it's applied physics, chemistry, and the like. But the same dynamic is present. So all Japan is doing to us.... But then the real question is, how is it that we were able in the nineteenth century to take Europe's own discoveries and develop into a far higher level of effectiveness and economic power then, and now how is it Japan is doing it to us now? What is it about the source country? My punch line in this preamble to my speech was -- and this is all getting back to your point -- to run the tab of twenty years of who won? I took the last twenty years -- '65 to '85 -- as a time frame, and I tabulated economic growth in one column by country, and the number of Nobel prizes won by the same country, and the correlation is inversely linear. In other words, the more Nobel prizes, the lower the economic growth rate. On a per capita basis, the highest per capita of Nobel prizes is Great Britain; the lowest economic growth rate in the last twenty years. The next highest per capita of Nobel prize rate is United States; the second lowest economic growth rate. The lowest per capita of number of Nobel prizes is Japan, and the highest economic growth rate. Japan in twenty years won three Nobel prizes; we won seventy-two! So I said, "Now guys, there's something wrong here." And the punch line is, why is it we can't exploit our own science as fast or effective in the marketplace as the Japanese are? And I pointed out to the trustees, I said, "I teach at Northwestern, and just wandering around the place, plus what's in my own

class and my lecturing in Chicago from time to time, I notice two demographic trends, which for the many years I have been involved, are just overwhelming now. One is the number of women in class versus the number of men, which is dramatically up. Secondly, every other face at the graduate school at Northwestern seems to be Asiatic. Guys, there's a lesson here somewhere. So entrepreneurship! What are we doing to ourselves?"

Then to complete this story, I was invited to the Brookings Institute in Washington, DC, three months ago for another set of reasons, which were unimportant, to give a lecture on foreign trade and why the imbalance, particularly with Japan. And I either made this good fortune or mistake, depending upon the view of what happened, to get in early, and I'm listening to these endless academic types pontificating about valuation of cross bridge of currencies and imbalance is a function of hidden terrorists, and the Gatt, and it went on and on and on. The chief economist of the Bureau of the Department of Commerce. The chief economist of the Bureau of the Budget. And finally at the end of all but the last lecture, which was mine, I have a mind-splitting headache. Finally I heard, "We've been dealing with macro policy here all day, and I wonder if it reaches all of our micro policy issues?" Well, that did it! I got up, literally threw away my potboiling speech and said to the audience, which were heavy-breathing Washington think-tank types: "I thought there were some exceptions."

I said, "I've got a different speech to give than the one I came with. I'd like to talk about some micro issues, and I'd like to tell you the story, ladies and gentlemen, in my allotted time. I'm not really prepared, but I know it well enough. I'm going to tell you the story of

a video tape recorder for the home and how Japan took the American inventions of the 'Fifties, in which America derived all the technology to make the video tape recorder, developed the whole thing, and Japan picked it up in the 'Fifties, and now today owns one hundred percent of the business. How did this happen?" So I took them through a chronology, and concluded in the more formal part, and I said, "As I think back on this twenty odd years -- most of which I was personally involved in one way or another -- and extending back another ten years with respect to people I've known and whose memory I trust, I don't find any relevance to what the yen/dollar relationship was. I don't find any relevance to whether they paid the Japanese worker more or less. All I find that's relevant is the will of America to take their own invention and commit the resources to get there, of which my own company was an equal party to the failure." That ended my formal comment.

So then a guy gets up, and he said, "Mr. Frey, what do you think the government can do to help this?" I replied, "I don't think the government can do much to help it, but they can do a lot to get out of the way to help it happen in the reverse instance." "What do you mean by that?" I said, "If the dividends are taxed twice, the debt to finance a company as a tax is deductible, you immediately tip a company's balance sheet towards debt and not equity, and you, therefore, make it short term. You've got to pay back the debt service every month and every week. Equity, at least, is in there on the basis of if a guy doesn't like it, sell his shares, with the end result, it's a long-term investment. We're going on the side of debt. Japan is the opposite. We're a bunch of short-termers, and they're industrial. And, furthermore, I've been through the experience any number of times of explaining to a Wall

Street type my long-term plans, and hopes, and strategy for the company, and they listened very patiently, took lots of notes. At the end of a long afternoon, he or she gets up and turns around and says, 'By the way, what's the next quarter's earning.' That's not helping any. Finally, the capital gains tax basis in this country is six months. Six months doesn't get you off the lab bench, in terms of developing a business. Six years might be appropriate. So the whole capital gains tax structure inverted for six months ought to be ordinary income, but six years ought to be zero tax." Well, as it turns out, there were a whole bunch of investment bankers in the room, and it got violent after that. There were certain questions of my ancestry and on and on and on, and they were really mad.

Then my point is that we've got a whole social and economic structure in this country which is short term. The Japanese -- I have a lot of Japanese friends. They use the title -- the term -- on me all the time, "patient capital." The video tape player -- that device which sells for three hundred bucks, and Americans buys two/three million a month now -- that took twenty years and billions of dollars in development. Twenty years is a long time to develop something and have negative cash flow. I'm pontificating now. Enough already!

Q Did you foresee the VHS coming out on top?

A You mean versus Beta?

Q Versus beta.

A Yeah, because it was a two hour machine, and the original beta was only a one hour machine. We had to see that.

Q But you would still get better quality in the beta? Now the super beta is out?

A Yes. Sony, in my judgment, has always had a little better quality in VHS, but it was a more limited machine from a point of view of the user.

Q The user will sacrifice quality...?

A For two hours you don't want to turn over the cassette and plug another one in. You have to assume the consumer is profoundly lazy. In other words, if he can get it on one cassette instead of two, he'll buy the one and won't have to change it. He doesn't have to get up to change the cassette, except to go to the bathroom, and that means he's going to the bathroom instead of changing the cassette. It's all simple things. If you assume he profoundly lazy, start there. That's why he never runs the record button. He doesn't want to bother reading the book. That's the consumer, bless him.

Q I still have trouble recording. I can't read the instructions.

A All I can say is QED. You and seventy percent of America that owns one.

Q My wife says to me, "Why can't you or [my son] Peter read these things?" I say, "You read them and see if you can make any sense out it."

A "It took me a long time to get that one right, and that's as far as you're going to get." Well, that's almost professional.

Q The other thing is, what about the new mini cassettes? Have you gone into those?

A There's another generation coming. My guess is is that there's going to be another -- and it's going to be the VHS/Beta fight all over again, but it's the new generation of mini. It's going to be Sony 8mm on one side, and it's going to be a not-as-yet-announced Matsushita camp

machine on the other side, which currently is under the code name of RDAT. It comes about from a very interesting circumstance. The Japanese are nothing if not interesting. This cassette has been around for twenty years. It's as primitive and obsolete a design as possible. It's also analog. Now, as you well know, the CD disc is out. It shows signs of being a very successful product. But, nonetheless, we still need a digital replacement at the very high quality level of the CD but in the form of a cassette. If you wish, what the world would like to have for its next generation is this digitized smaller so that the next Walkman will be the size of a match box, let's say.

Japan has been busy working at digitizing and remodernizing this thing, and they have what they call RDAT -- Rotary Digital Audio Tape. It's about that size, and the Walkman will correspond to the thickness as an extreme. Now Sony will introduce this product quickly, and probably Matsushita will shortly thereafter -- audio digital. The same quality level, the same characteristics as that disc, but different form factor for portability. Sony will then have 8mm for video and RDAT for audio, both digital tape. The R in RDAT stands for rotary. It's the same type of recording mechanism as in the video machine. Matsushita is taking RDAT -- same form factor -- and they're going to make it into a video player. So there's going to be a fight of 8mm versus RDAT video.

And, of course, Matsushita's scheme on this -- he's now an old guy -- is exactly the right one. In an extreme case, you buy a single machine, and one switch says audio and one say video, so it's all the same machine -- the same cassette. One has got video information, one has got audio information. Or, if you really want to be creative about it, you buy the basic machine, and then buy an ad-on for the other pur-

pose. You can always buy the video machine, and buy the audio option or vice versa, so it's going to be a marketing man's dream, in terms of the single unitized system for the home. So the fight is going to start all over again. I think they're mad, in one sense, but delightful in another, so we'll see what happens.

Q Maybe that's why I'm holding off on the CD recorder, because I'm really waiting for the micro cassettes.

A I bought a CD portable. I bought the little square one about so square.

Q The V-5 Sony?

A Yes. And I just plugged it to the back of my phono jack in my present hi fi set, and, of course, I love the music. People will come over for dinner, and they look at that and say, "All that music comes out of that thing?" I said, "That's the latest and the next generation." It's going to be starting all over now.

Q How about metallic tape? Has that caught on?

A No. Failed. In fact, the latest 8mm stuff is coated in magnetic particles, just the higher grade of the present VHS or Beta. One of the big problems of coated metallic tape is it's a fire hazard. The metal particles go through a period in which it will burst into flame and raw air -- just like that! It's what you call pyrogenic. It's pyrogenic to beat hell, so it's very dangerous stuff in the manufacturing process. Now once it's on the tape and coated and imbedded in, it's all right. But, I think, that in practice, and I was in a BASF plant years ago when they were doing some of the early work. The place looked like a goddamned bunker with the fire, and everything was explosion-proof, and I said, "Who in the hell wants that?"

Q You almost went with BASF?

A Yeah.

Q What spooked you?

A I spooked them.

Q Why?

A We developed this different type of video tape recorder -- a so-called linear recorder. A very interesting technical development. And we had a lab and a little tiny factory all put up in California -- fifty/fifty. And we had a big meeting one day, and I said, "That's a very nice development. Now we go to the next generation." "What do you mean next generation?" I said, "No, no. Japan is already doing that on video. They're different. That's out next year." "Oh, no, no." I said, "Hey guys, whatever Japan is doing today, you have to introduce the next generation as your first generation." "Oh, no, no." I said, "Hey, do you live in the same world I do? I'm telling you that which you're doing now is Japan's next generation. You have to go a generation beyond your own generation to introduce against Japan's new generation, which is your now generation." So they had a big conflab, and they said, "We don't agree with you, and we're going to proceed with or without you." I said, "Well, I guess you're going to proceed without me." We terminated our half, and a year and a half later, they took a forty million dollar write off.

Rather recently, Plannkuch, the man I referred to earlier, was in Germany. In the meantime, the guy that was running the BASF project reached retirement age. Pfannkuch ran into the number two guy rather recently in Germany. Pfannkuch says, "Versamon wanted to let you know -- asked me to give you his regards -- and that you were right." Just a

simple phrase: "You were right." I can't help them anymore. So that was the end of that one.

Germany has had trouble with Japan as a concept. I think Germany is finally learning that they're real over there, and they're going to kick the hell out of Germany unless they get with it.

Q You've had a marvelously varied and successful career. What do you see in the next two years before your retirement? What's on your agenda?

A Get the million dollars -- to have the company succeed in the next two years to the point I get my million dollars for my chair. How's that? Very simple, self-serving answer.

Q That isn't going to occupy all of your time. What else is on the docket?

A Probably increase my teaching load a little bit. Get a little more active. Although right now I think I'm active enough. I'm on a number of public company boards in which....

Q I've noticed that. You have some interesting ones.

A Textiles, and machine tools, and forklift trucks, and....

Q How is Clark Equipment doing?

A Badly, right now.

Q They're going to move? They're going to consolidate and go out of Michigan?

A Yes, they moved out of Michigan. They moved to South Bend. Their problem is, of course, they've got -- as late as last Saturday we met at a special meeting on the basis of getting out of the forklift truck business, which has been their core business, because of Japanese performance. Then I looked at Jim Reinhart, their chief executive. I said, "Jim, you'd better get out of the camera business."

Q Obviously, you plan to still remain on some of these boards?

A All that will have me. Now this board I'll have to get off of. They don't like retired chief executives, and I don't blame them. I'll always remember when I came into the company and Pete Petersen, the then chief executive, never came back.

Q Was that by choice?

A By choice. To have the former chief executive hanging around looking over your shoulder doesn't help any, particularly if you think there might be some better way of doing something. I'll accord my successor the same [courtesy]. But that group of boards, plus maybe one other over the next couple of years, will keep me busy. That keeps you busy. It keeps your hand in it for awhile. Most of those boards have a statutory age of seventy, so I've got another five years, and that's about what I'm worth. After five years of no longer being an active chief executive, you start to get out of it a little bit. The statutory age out at Northwestern is seventy-two, and so that's another seven years, so I'll do that. I assume it's Northwestern. I don't know that for sure.

And not get up every morning at 8:30 and have to go in and run the B & H. I had seventeen years of that. That's a long time to carry this thing around with you every day.

Q What about American Motors? Are they going to make it?

A They're make it as long as their money holds out.

Q But how long is that going to hold out? How long is their patience going to hold up?

A I would say their patience will hold out another two years.

Q And then they will just pull out?

A Well, either by then it's either in the black or they'll pull out. It's an interesting process. It took me a helluva long time to get used to being on that board losing money. I don't lose money well. I finally figured out, having met the new head of Renault, George Besse, that he's committed to the damned thing. They put in fifty to hundred million dollars a year and will for a couple more years, I'm convinced, until it turns the corner. And I can't figure out -- do you speak French?

Q A little.

A Do you recall when you go into the front gate of Versailles, there's [an inscription] in gilt letters: "A Toutes Les Gloires De La France." I think that's what that's all about. It's the only thing I can conclude.

Q It sounds good.

The Lyric Opera Company. That sounds like fun?

A Yeah. I don't find it so much fun any more, but I love opera.

Q Is it [Samuel] Insull's old group?

A Yes, it is.

Q The one they parodied in "Citizen Kane?"

A Yes. The house he built. Lyric Opera -- the Civic Opera Center is the one Insull built. That's where he holds forth in the scene. There it is in all its glory. It hasn't been changed much. It's been restored. In in beautiful shape. I'm sure he'd recognize it tomorrow morning if he walked in there. In fact, you're right, that's Insull's old group. But that's not the one I enjoy any more. It's not fun, but I like the opera.

But I got involved in a couple other things. One of them was called Youth Guidance.

Q I wanted to ask you about that. That looks fascinating.

A That deals with teens and young professionals in South Chicago's Hispanic and Black high schools -- dropouts, gangs, and the like. That's where it's at.

Q The drug scene?

A That's the pits; that's the trenches. They've got my heart and soul. What we're going to do, starting from this academic year, we'll be in full flower in September, 1987. It's going to be a year from this coming September. We're going to have two pilot schools equipped and running. One at the Roberto Clemente High School, which is all Hispanic. It has a dropout rate of seventy percent -- freshman to graduation. And the Austin High School, which is a hundred percent Black in similar shape already. At Roberto Clemente, I've got my friend who runs the Hyatt Hotel Corporation to agree.

Q What's his name?

A Pat Foley. I hope I've got the school board to put the money up to take a wing of the Roberto Clemente High School, which is quite a new modern building, and gut it and put in a complete food service function. Have Hyatt equip and train the teachers in food service operations, including the chef, so we have a graduation option for the Hispanic young people who want to enter the food service industries, which have high constant employment rate opportunities. So they can enter some notch above the best boy at $3.85 an hour -- give 'em a leg up. Some vocational skills. And I'm going to get that done. That program is just unfolding now through Youth Guidance. I've talked Foley into doing it. I know the head of the school board who is a Hispanic man who knows, which is a help. Solarz, who is the Hispanic Congressman, will get a

little Federal help if necessary, if Graham Ruddman has any left over.

And at Austin, we're doing all the same thing, except it's going to be a course in automotive electronics. And that we're going to get done. That step to get these kids off the street with some sense of skill and value and, most importantly, a sense of value to themselves.

The other one is one I'll make book you've never heard of it. It's called Second Harvest. Second Harvest operates seventy-eight food kitchens in the United States to feed the hungry. Last year we produced a hundred million pounds of food. The food is all for free. It's the surplus off-brand, off anything from the food companies.

Q I have heard about that. You have to go to each of the food companies and ask them for their throwaways.

A So we get two deals. We get the food companies throwaways -- all FDA approved -- and then we have to make deals with the trucking companies to get this stuff out to the seventy-eight locations. And we feed the hungry, and there are hungry in this country. Let's not kid ourselves.

So on one end, my favorite is to try to get the high school kids with the skill of something, and the other end is to feed them when they're hungry. To me, that's where I'm at. That's what I like to do. But Lyric Opera has enough people to support it -- society bashes -- they'll survive. I don't think too many people are paying enough attention to feeding the hungry or the dropout problem. Everybody talks about it, but not many people do anything about it. So, that's where that's at. I enjoy that work.

Q You can't beat that. What is the Springs Industry?

A Textiles. Springs Mills. They changed their name, but they've got

some other divisions. They're the largest textile maker in the world.

Q The old Springmaid?

A Yes.

Q They've done some gloriously ribald advertisements?

A Well, unfortunately, that died with the Colonel, who is the old Colonel Springs himself. They haven't done anything decent since, but they're somehow getting a little bit back to that. I notice in the recent time, a little more open concepts and little less staid approaches to sheets and pillowcases and fabrics of all sorts.

Q You mentioned Milicron in an earlier conversation. How did that come about?

A Let's see how did it come about? Oh, I think, it was because right after I'd left Ford the Clark Equipment Company called, and on that board, which I first appeared there, was Jim Gier, who's head of Milicron, so that's how I got to know Jim. And a few years later Jim said -- he seemed to like this kind of stuff -- "How about joining our board." So I joined his board, and I've been on both of those boards since '69 or '70, so I've been on the board for years.

Q What does Milicron do?

A Machine tools. They're the last viable world-class machine toolmaker left in this country. The Japanese have killed almost all the rest. They are a survivor. They made a lot of right moves. They've done some very exotic things. They have produced robots -- American robots -- for example. They're the leading producer of the silicon in wafers for the semi-conductor industry. They're the foundry of the business. They make these wafers upon which you put the chips. So they've got some pretty far-out successful exotic business. I enjoy them.

Q I'm interested in Clark Equipment because I grew up in Battle Creek, and my father worked for them almost all his life.

A I wondered how you knew a little bit about them. They have fallen on hard times.

Q Yes, they have. My mother still lives there.

A As a matter of fact, they are just in the process of closing up the last of the Battle Creek plant.

Q She told me when I was there about a week ago. We drove by it. I said, "What's happening?" She said, "They're leaving Battle Creek." I remember Buchanan used to be the headquarters.

A Yes. And that's the one we finally got out of and moved. Took that building and made the credit company headquarters for that. There was a large credit company, and they moved the corporate headquarters -- and it's smaller today -- to South Bend into a god-awful, modern glass house. It's cold in the wintertime and hot in the summertime. It's a bloody disaster, but it's an architect's dream. I said, "The only trouble is, Bill, you had to put people in it."

Q That reminds me. I wanted to ask you about your role in this building. I'm very impressed with this building.

A We first wanted to get out of the old Lincolnwood factory complex, which we're selling this month, as a matter of fact.

Q It was outmoded and outdated?

A Yes. We knew we had to get out of there. In the first place, we were going to put the thing up for sale. That's the last of the old company.

Q Someone said it was wonderfully built. It's almost indestructible?

A It was built by the Army during World War II as a field hospital.

It was built like bomb-proof. Anyhow, we had to get out of there, so we starting casting around. This building was just a half-completed shell. At first, I didn't pay much attention to it, but some of my associates have felt it might be the best thing. It was being built to sign off with Lincoln Properties Company, which is a spinoff of Trammel-Crowe out of Dallas -- couple of young guys. And somebody said, "They're known for building very good buildings." So one thing led to another, and we finally ended up making a deal that they would complete the building to our spec. We would take the top three floors with rights on the next three floors for half of the building. So we made the deal. That was the spec for the building itself, and then for the interior we hired a company called IDS -- Interior Design Systems -- downtown. A bunch of young people, which I thought was pretty good.

Then we formed a little team headed by a gal named Janice Wood, interior designer. She and I used to spend our weekends designing this thing. So it's about half her and about half me. I wanted, for example, wood as the main theme -- the main ingredient. As it turns it, this is Canadian cherry throughout. Not too many buildings are done with wood, but, as the old carpenter/cabinetmaker, I liked fine cabinetry. Then we found this guy out in Palantine who is a German cabinetmaker, and he made all these cabinets for us. A superb craftsman, and that's how we got the thing built.

Then the artwork; there's a dozen pieces around the place. What we decided to do, I said to Janice one day, "Do you have somebody in the art community in Chicago whom you trust, and give us the names of two dozen young artists who are up and coming but haven't made it for whom a commission would be a big step forward to them. They don't yet command the

stratospheric prices." He said, "Sure." So we got a dozen/dozen and a half, and gave them commissions. Now all this artwork is all by young unknowns, some of whom will be famous someday. I suppose they'll make a lot of money on their art one day. The issue was to get some good representative arts, community-based, and of young people who needed a helpful start. There was only two super, commercially viable pieces. One is right behind us -- an Alberts. For some reason or another, those things are worth fortunes. I could make those in my basement! And the other is the antique clock and the French sculpture in the lobby by the woman. Very famous now. That was given to us by distributors of the company on its fiftieth anniversary as was this clock. Then we have something else around here that was given to us on our seventy-fifth anniversary. We're eighty years old next year.

Q Are you going to have a big celebration?

A Yup. The interesting thing about being eighty years old, in eighty years there's only been five chief executives. We don't jump around very much.

Q Were there Bell and Howell?

A Yes. There was a Bell and a Howell, of which Bell was the chief executive. Howell was the technical genius, and Bell was the businessman. He didn't last very long. He sold out early. He sold out about the first world war. He said, "We've milked the cow." Howell stayed with the company until he died in '48. That's Howell right there [showing photograph], and in front of him is the camera that is the predecessor to the DR-70, which is in one of the cases up front. And that desk that he's sitting at in the background is that desk. That's his desk.

Q That's great. I'm glad you saved it.

A Had it restored at the time we moved here.

Q You've done a great job. I suppose it might be apropos -- I hope it isn't a cliche -- but to ask you at this point to codify your business philosophy, what would it be? Taking in mind young students of design history might listen to this, what sort of message would you want to leave for them?

A In terms of the physical goods, design is it. The basis of the business is the design of its products in its full sense. And you can make a lot of money if you keep in mind you're going to make a lot money for your customers in good design. And good design is an art --it's a craft. It's something you learn by experience. It's got some science in it. Fundamentally, a good design -- I don't care whether it's a design for package, automobile, audio tape player or a desk -- you know when it's right if you're a designer. It's just a matter of -- it clicks. It looks right, it's functional, it works. There's no way to describe it.

Q So you're a believer in form following function?

A Yup.

Q How about business entrepreneurship? What sort of message will your career leave for them?

A Entrepreneurship, which usually implies that I mean to imply an innovative process. That is business. In fact, I teach my students in beginning lectures to read Joseph Schumpter -- an almost forgotten economist from Vienna.

Q Later of Harvard.

A Yes. He came to this country and went to Harvard. A man who had

three desires in life. He wanted to be the world's greatest economist. He probably came close. The biggest problem is his contemporariness with John Maynard Keynes. Secondly, he wanted to be Austria's greatest horseman, and I'm told that he succeeded. And he wanted to be Vienna's best lover. I don't know much about that. But he taught in his early books, one of which was his doctoral thesis, that the wellspring in the driving force in business and industry is innovation. That's what it's all about. All else is caretaking until the next innovation, hopefully. Therefore, that's what it's all about. And innovation, inevitably, occurs either in what we call today's programs a service, which we'll be making as a service, or in a product, and that gets back to design. So it all is a circle. Innovation leads to design, and design leads to a product, and products lead to companies, and companies lead to generation of wealth to create more innovation. So that's the Schumpeter circle applied to my view of innovation and design. But the bottom line to it all and what we in this country have got to do is get back to a thoroughness and quality of design in its full sense. I picked up recently a book by James Killian. I'm sure you remember the name.

Q MIT?

A Correct. He wrote a book -- just been published -- called The Education of a College President. In reading this book, and towards the end in the pro-epilog part of the book he says, and I'll read it to you.

Quoting Mr. Killian, page 410:

> We in the universities cannot wholly disclaim responsibility for an unmistakable decline in the quality of everyday life as so frequently reflects in American craftsmanship. In the end, reliability of too much of our technology and the low quality of many consumer products and their service. I cannot forget a cartoon that occurred several

years ago that highlighted this shallowness and shoddiness. 'This toy is designed to prepare the child for the modern world. No matter how you put it together, it won't work.'"

That's Dr. Killian of MIT talking about the responsibility for the shoddiness of American products.

Q And that's what you constantly fought against in your career?

A You betcha. I've fought that from the day I left engineering school.

Q Not only shoddy merchandise, but shoddy merchandising?

A That's right. So, when all is said and done, the antidote to that is what I've stood for for thirty-five years. And that's what I want to leave with my students or anybody else that wants to listen, but students pay money to listen.

Q If you succeed in leaving the company in two years in the best shape you can, and if you succeed in having a year in the Bell & Howell chair of applied entrepreneurship, would you be teaching and writing?

A Yeah.

Q That sounds like the best of all possible worlds. I'll hope you'll have an active seminar or two?

A Well, professors love seminars.

Q You won't have to lecture too much?

A I find that when I write, I find it much concentrates your mind. It gets your thoughts straight. The word is a discipline which nothing can replace in my view. While we're all in the video age, and I've certainly been a part of it, that's not the final game as far as the intellectual requirements of expressing your thoughts and teaching or explaining them to others. You have to write it, so I find myself

writing more and more. It used to be I didn't write much. And writing is like any other craft. You know how to write by writing. I'm still at that stage in which I agonize to get -- I must rewrite some sentences ten times to get it just exactly right. The fewest number if words in the most expressive way and not dull. I don't know why I should tell you this, you're a writer.

Q I'm also interested in the possibilities that you could come up with a series of recorded video tapes of higher education as well. That you could spearhead a movement to have famous professors record their lectures and have them available.

A Is anybody doing that?

Q I don't think anyone is doing that.

A I wonder why not, because you just want to see captured -- oh, I can think of any number of professors whom I've known like Lovett of Harvard on marketing. He happens to be a very good speaker. He's an interesting guy. He should be recorded. I guess I never thought about a video/audio history of them talking.

Q How about upgrading of your educational teaching skills?

A Yes.

Q Famous professors giving their well-known -- their courses. It could be a condensation of well-known courses that could be sold as a higher-education video.

A There is some, of course, video teaching today, but much of it's talking heads. That's one aspect. Much of it is more related to the continuity of the course. It's not a memorable lecture which people would treasure. It's not a specific thing like Lovett on marketing or Jim Killian on some aspect of that book which is charming in many ways.

I'd love to have Vannevar Bush talking on Science: The Endless Frontier. That would be priceless to me today.

Q Or Schumpeter?

A Something on the theory of The Economic Theory of Development, which was his first seminal work. Some verbal seminar content. You're right.

Q You could share in what could be an innovation in that direction. You could do a series of recorded lectures coming out of that Chair.

A Watson or Crick lecturing of the unraveling of DNA. Tom Bardeen lecturing on the theory of the transistor as developed by E.N. Shockley, or was it the other guy? You're right. I never thought about it. I'm surprised nobody's doing this.

Q It's a wide-open field.

A A video history.

Q Half way through this series I said to myself when I saw the revolution in video cameras, why didn't we put this on video tape? Why didn't I film you on video tape? It would have been perfect, but we're too far along.

A Is there an end game to this thing?

Q You mean, how far we can go?

A Yeah.

Q No. It seems endless. The ripples are simply endless. We get endless referrals. I'm now getting names in searching out female designers I find. There's about a dozen of them. It would be interesting. Most of them are at G.M.; one or two are at Ford.

A I don't think I knew any at Ford in my day. Was there one? If there was, I didn't know her.

Q They were very low echelon if there were. Mimi Vandermolen is the key one there now. She's a manager.

A But she's after my time.

Q But there are about a half a dozen at General Motors and one at American. So there are endless ramifications. As I said, I'm getting into product planning, I'm getting into body engineering, and your career seemed to encompass all three of those disciplines, so I'm fascinated by that. But, yes, there seem to be endless ramifications, but, I suppose, we'll get to the point where we'll have to call a halt, but it doesn't seem to be in sight at the moment. That's why I'm fascinated by the whole concept. But, video -- the sky is the limit on that.

A You can have it with any degree of artifacts. You could imagine Thomas Edison lecturing at Greenfield Village on the discovery of the light bulb standing in his laboratory reconstructed there. But you wonder why nobody is doing this, because the greats just pass through us at all times.

Q There have been some attempts to recreate, at a fairly low level, but it approaches cartoon. You have to handle it very carefully. Very skillfully -- to a point where you wouldn't want to recreate the greats of the past, but you'd want to get as many of the current standout professors.

A It's the radio equivalent that's the additional sight to be oral history. Is there an oral history center at Columbia? Why does it stick in my mind?

Q They were the ones who began it. In fact, the oral history program at the Ford Archives was the product of a student of Allan Nevins [Owen Bombard], and then Allan Nevins came out to Dearborn to write the three-

volume history on Ford. So we have a tremendous library of reminiscences of Henry Ford I -- relatives, friends, and associates of Henry's, and it's just about....

A You've got tapes of Henry Ford I?

Q No, no. They were done in the 'Fifties of the surviving people who worked for him, worked with him, who knew him, who were relatives of his. Some three hundred and fifty separate interviews.

A Which Nevins used as grist for his mill?

Q That was one of the reasons for their existence. The whole Ford Motor Company Archives was set up to be the handmaiden of the Nevins research effort, and once those volumes were completed, we were, by then, a well-known, first-line, industrial archives. The company, rather short-sightedly, donated it to The Edison Institute [Henry Ford Museum & Greenfield Village], and that's who I work for now. We have the Ford Archives. How the Ford Archives came into existence involved a lot of research.

A You have this head of The Edison Institute -- formerly of Chicago?

Q Oh, yes. The dynamic Harold Skramstad.

A From the Historical Society of Chicago?

Q Right. He was chief....

A I knew him somewhat when he was here, so say hello to him. He'll probably remember me.

Q I will. And he's transformed the museum and village complex into a going concern. When he got there, it was almost moribund.

A I know. He was sent there to revive it, hopefully.

Q Right, and he did.

A Somebody sent me for Christmas a book out of your place called

American Ingenuity. It's a coffee table-like book but out of the ordinary. What you really ought to do is do a first-rate series set of monographs on that period of American national history. That's what you really ought to do.

Q I think that's in the works. This issue here is one of the Herald's -- the reviving of this issue and expanding on it. The editor is someone you may know from Evanston.

A Who?

Q Fannia Weingartner. She works over in Evanston.

A Really?

Q Yes. He picked her to be the editor. He had known her from Chicago. She is, apparently, a well-known editor in this area.

A This is Volume 14, so you've been at this one awhile.

Q This is the new series. The new series has been out for about a year and a half. The old Herald went through a student period under Henry Ford, then a revival of the name Herald in the 'Seventies, and then the new format and the new direction under Fannia and Harold, which Harold follows very closely.

A Some of these people I know. There's Johnny Najjar, Bill Schmidt. Good Lord!

Q Bill gave us those pictures as well as the drawings.

A Did he?

Q Yes. And Alex Tremulis called me up in great glee, he said, "After all these years, my...." Johnny had scrounged it. We'd used his visionary drawing. He called me up, and he said, "I thought I'd lost it." I said, "John Najjar saved it for you and gave it to us."

We'd like to thank you, Mr. Frey, for this marvelous interview.

A I remember the Futura.

Q We've enjoyed every minute of it.

A I've enjoyed it.

#

The copyright status of photographs and printed material is often difficult to determine, because it is affected by such things as the employment status of the creator, the date material was created, the date material was first published, what information accompanied the first publication, and whether the copyright holder exercised his/her/its rights to extension. The Henry Ford has not determined copyright status for many of the photographs and published materials in our collection. Therefore, the Henry Ford is acting only as an owner of the physical original.

- The Henry Ford is not responsible for either determining the copyright status of the material or for securing copyright permission.
- Possession of a photocopy does not constitute permission to use it.
- Permission to use copies other than for private study, scholarship, or research requires the permission of both The Henry Ford and the copyright holder.

The copyright law of the United States (Title 17, U.S. Code) governs the making of photocopies or other reproductions of copyrighted material.

Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specific conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." Such uses are considered "fair use," and by law do not require permission of the copyright holder. If a patron later uses a photocopy or reproduction for purposes in excess of "fair use" - including but by no means limited to posting on a Web page or to an Internet Use group, or publication in a book or magazine - the patron may be liable for copyright infringement.

Benson Ford Research Center, The Henry Ford
20900 Oakwood Boulevard · Dearborn, MI 48124-5029 USA
research.center@thehenryford.org · www.thehenryford.org