

RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY

NEW BRUNSWICK

AN INTERVIEW WITH RICHARD FLITCRAFT

FOR THE

RUTGERS ORAL HISTORY ARCHIVES OF WORLD WAR II

INTERVIEW CONDUCTED BY

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TRANSCRIPT BY

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Elizabeth McDonald: This begins an interview with Richard Flitcraft on July 27, 1995 in Dayton, Ohio. I would like to start talking about your family, the history of your family and your parents.

Richard Flitcraft: Well, where do you want to start then?

EM: Were they immigrants or had they been here the whole time?

RF: No, no, they had been here. I grew up in New Jersey, so I ended up at Rutgers. Both my parents, their parents, grandparents, all had been here a hundred years or so.

EM: And you grew up in southern New Jersey right?

RF: Right, Woodstown.

EM: Was it a very rural area?

RF: Very much so, although the town is about half retired farming folks and the other half DuPont people. In fact, I was being exposed to organic chemistry in eighth grade. So, really, I guess it oriented me to going into the field of chemistry.

EM: So you already knew you wanted to study it.

RF: Yes.

EM: Well, that's very interesting. And your father was a farmer?

RF: Farmer. We had a dairy farm. Great-grandfather that started a retail dairy business that lasted almost a hundred years. My brother shut it down in the late '70s.

EM: Financial reasons?

RF: Yes, [he] couldn't hack it.

EM: And your mother was a teacher?

RF: Yes, I really don't know how many years. I don't think it was too many. With six children, she had plenty of teaching to do at home.

EM: I'm sure. Had she gone to college?

RF: It was a teacher's college. I don't know whether it's a two-year or four-year, probably a two-year, three maybe. It was Glassboro.

EM: Oh, wow. Your father, had he gone to college?

RF: No. No, he had not.

EM: So how was growing up in that rural setting?

RF: Fine. We were busy and, most of, a lot of the growing up was during the Depression days and we didn't even know there was a problem.

EM: It didn't hit your family?

RF: No. Well, living on a big farm, we had what, at that time, was considered a big farm. It was over 500 acres, a herd of cattle, milking cows, over a hundred. So it was, you know, a big operation. And all the milk was sold in that town.

EM: Did you help? I mean, did you work everyday?

RF: Oh, Yes. Yep, I did. I was delivering milk when I was in seventh or eighth grade, I guess.

EM: Driving?

RF: Oh, sure. Police all knew it, but they didn't bother us.

EM: Right. And your parents were Quakers?

RF: Yes.

SP: Did you grow up in that religion?

RF: Yes, and well, really, pretty much stayed with it until we got married and started moving around. [I] grew up as a Quaker.

EM: Was the town predominantly Quaker?

RF: No, I wouldn't say so. We had a very strong Catholic church and Baptist, Methodist, Presbyterians, as well as the Quakers. So it was widespread, you know? It was probably a couple thousand people in the town. I don't know what the total township was.

EM: Is there anything else distinct you can remember about your community?

RF: Well, if one thinks about the racial situation, blacks in town all lived in one part of the town. And we probably, probably were in the early days of integration. My dad was head of the board of education, and they shut down the school over in the black community [and] brought the kids over to the white community. And [I] really didn't appreciate any particular problems until our

high school class went to Washington for the annual trip. And I don't remember the, I think we were staying at The Mayflower, whether The Mayflower is still around in Washington or not. But we were scheduled to go on a boat ride on the Potomac in the evening, and we were told the black kids couldn't go with us. And I didn't quite know what to make of that. I was president of the class at the time and, I know we had lots of discussions, but we just canceled it. But that was the first real scene, as far as I was concerned, showing the difficulty with the races. We had black people working on the farm and we had a married couple, the woman worked in the kitchen, ate with us all the time, so, you know, we never gave it a thought.

EM: Do you remember what grade you were in when they desegregated the schools, or how old you were?

RF: No, I probably was in the middle grades because it certainly was a time, we were seniors, why, you know, the blacks would've been with them right along. We didn't have any, as I remember, we didn't have any inter-racial dating. But, I just didn't give any thought to the situation.

EM: How did you know you were going to college? Did you always plan to go?

RF: Well, I guess I'd been pushed in that direction from the very beginning. I took the college directive courses in high school, Latin, the advanced math, chemistry and physics, which was called the Classic course at that time. And somehow or other, I managed to get a scholarship to Rutgers and went from there.

EM: What percentage of your graduating class, would you say, went to college?

RF: Let's see. A class of about sixty-five, probably a quarter of them then.

EM: Really? That sounds like a large percentage.

RF: Well, you know, it was a fairly affluent community, actually. DuPont people certainly did well. And the farmers around there were all pretty well-off. I have no idea what the average incomes were or anything like that.

EM: And you knew you were going to study chemistry when you got to college?

RF: Well, you know, having been exposed to chemistry from such an early age and [I] obviously knew there was a job, so [it was] pretty natural. And I guess I was recognized as having the abilities to do it. And with four other brothers at home, some of whom might or might not be able to hack it through college, might as well get out and make room. The second brother did not go to college, the third one graduated from Rutgers, as did I, and then we had twin brothers and they did not go to college. A sister who went to Oberlin, so about half-and-half.

EM: You had a large family. Besides Washington, had you ever traveled outside of your area when you were younger?

RF: No, we used to have great conversations about how we were going to get to New York. Got to Philadelphia very regularly. School, at that time, had music appreciation classes and we'd go to concerts. ... We happened to be in the audience the night that Stokovski played this Communist hymn, song, whatever. It really created quite a hassle. I don't remember the name of it, but it was very strongly communist and he got a lot of flack for that.

EM: Were there any other repercussions?

RF: I don't know, I was in high school. I had other things going on in my mind.

EM: With World War I, your parents, your father obviously did not serve?

RF: No.

EM: So it was a moral decision?

RF: Well, no, it would not have bothered me, but having a technical degree I was deferred.

EM: And your father, it was a moral decision?

RF: Oh, Yes, Yes. He was too old to go for the Second [World War]. And so, and again, the farming business was considered crucial to feed people. One of the, one of my brothers was in the Army, was in the occupational force in Japan.

EM: How did he feel about that?

RF: Well, he thinks we should've done more than we did with the Japanese. [He] saw lots of stuff. He was one of the people who were enroute for an invasion of Japan when the atomic bomb was set off. There was a whole interesting set of things involved with that, but he clearly feels that having done that, [that it] was the absolute right thing to do.

EM: As did a lot of the GIs who were on their way. Did your father support him going into the military?

RF: He was drafted. We were not members of the Quaker group that fought [against] everything. I guess we weren't that good a Quaker. I went to Rutgers in 1937, well before WWII started. My brothers was drafted after the war started, probably in 1943

EM: Okay, so then you were off to Rutgers? Where did you live, do you remember?

RF: Oh, gosh, first year was in some rooming house not too far from where the gym is now. There was no gym at that time. And I spent some time living in a professor's house, being a babysitter for him.

EM: What professor?

RF: I beg your pardon?

EM: Do you remember what professor?

RF: No. I haven't bothered to go back and look at anything. I was over in Highland Park, so I would ride a bicycle from there over to the eight o'clock classes in the morning. And then [I] joined a fraternity, Phi Gamma Delta. Then, I guess, I lived there for probably two or three years.

EM: Where was that fraternity house?

RF: Well, at that time, it was right on the street that runs along the river. High on the hill there, opposite of where the multi-story dorms are now. It was burned down, about ten, fifteen years ago.

EM: Oh, okay.

RF: Three fraternity houses up in there. So, I was active in that, [and I] worked for DuPont [in the] summers.

EM: Oh, really?

RF: [Yes].

EM: And what was your role at DuPont?

RF: What was my what?

EM: Role. What did you do when you worked there?

RF: Oh, I was just a technician, performing routine chemical tests. And a[n] interesting sideline there. I guess we had organic chemistry in our junior year and I was not doing well in it for the simple reason that all the DuPont people, chemists, I didn't see them running around with all these formulas. And if they needed a formula, they'd look it up. Well, in organic chemistry, at that time, it was taught that you had to memorize everything. And I went to see the professor about it and I said, "You know, it doesn't make sense to me that we should memorize all these formulas when we've got books we go to when we want to do something, so, you know? Why this approach?" And he said, "Well, that's the way it is, and if you want to pass the course, go ahead and memorize. If you want to fail it, why then, don't memorize." So, I said, "Aye, aye, sir."

I'm going back to memorize it.” It was professor Bill Cottle who did that. Who ended up, a few years later, going with Exxon in their R & D operations. But the jobs at DuPont certainly made my college education easier to follow. I would set up two and three experiments in an afternoon, rather than one, like everybody was supposed to do. And my senior year, I was on lightweight crew full-time, at Rutgers, and I would set up the experiment. We worked in teams, I'd set up the experiments and go on out for crew practice while the rest of them ran the experiments. It worked out very well. But, by being able to run two and three experiments at a time, why, I would spend a lot less time in the labs than was called for. Another interesting item in quantitative analysis, the standard is to run the sulfate analysis, and I used to run sulfate analysis by the boatload at DuPont in the summers and by a very different technique. So, one afternoon, we were running sulfates and the prof came out and found me running it the way I did at DuPont, and I was using vacuum suction. The standard way was to use a paper filler and let it drip through. I don't know whether you've had any chemistry or not, but I was doing it the other way. So, again, you know, “Why are you doing this?” And I said, “Well, it gives you good results, it's a lot faster, and I've got other things to do besides look at liquids dropping through a paper funnel.” And we went back and forth and finally I said, “Look, I'll make a deal with you, I'll take whatever mark I get running it this way.” He said, “Well, that's the sporting thing.” So I was lucky and I got a hundred percent on it. No more questions from him about any of my lab techniques.

EM: He knew you knew the practical uses already.

RF: Right.

EM: What year did DuPont come to your town?

RF: To Woodstown? Oh, it was back before World War I. They started in the dynamite business in Capetown, and after World War I, they got into the dye stuff business. The Chambers plant was primarily in dyestuffs manufacture and lead tetraethyl, which is used in gasoline for cars.

EM: They had a really large affect on the community, it seems.

RF: Oh, Yes. Whole South Jersey. I'm sure they're feeling it now as they're cutting back.

EM: What percentage of the people in your town would you say worked for DuPont? A half, or what?

RF: Well probably half of the working males. No women working for them. So, you know, you're down to probably twenty percent, or something like that, of the total population.

EM: And you took five years to get your degree?

RF: Yes. The reason for that, I got, oh, what was it, a high fever, Supposedly it was carried in milk. But at any rate, I spent, I guess, probably six to eight weeks in the infirmary at Rutgers. So by that time, you know, I was too far behind on the semester, so I just dropped out. I went to work for DuPont and then came back the following year, so I moved from the Class of '41 to '42. But, undulant fever, I think it was called. There was a fair amount of it going on in those days. They had no treatment for it. They really weren't sure what it was about. And I don't think it was fatal, you just had no zip, ran a high temperature, 102, 103, all of that. So, I guess a lot of people thought I wouldn't finish college as a result of that. It would be nice to make money, but I guess I had to be confident I was going to finish.

EM: What year did that happen, your junior year?

RF: No, it was the sophomore year, I believe. I think it was the second semester of the sophomore year, spring of 1939.

EM: How was living in the fraternity house?

RF: Fine. A little tough to get studying done, now and then. I doubt that's changed.

EM: No, I don't think so. Did you have a lot of interaction with the New Jersey College, with Douglass?

RF: A little bit, a little bit. My wife, Bert and I, went together when we were in high school. And, for a degree she went off to the University of Penn, Nursing. And [we] agreed that, "Okay, we'd forget about it for a while. We'll get back together again."

EM: So you did some dating while you were away.

RF: Yes.

EM: Did you have parties there or socials?

RF: Oh, yes. Once December the 7th, '41 came, why, there wasn't much partying done.

EM: Right, where were you when Pearl Harbor happened?

RF: Well, I was playing bridge that Sunday morning at the fraternity house when the word came. And it's always kind of interested me, the fraternity brothers, those who really had some long range plans, like myself, all survived. Those who didn't have any obvious plans, all died. One guy was shot when they were gonna surrender to the Germans. He was walking to them with a white flag and they gunned him down. Another one, who I would not have given a car to drive anywhere, he was such a crazy character, [was a] commander of a B-29. Flew out of Alaska and was never seen again.

EM: They assumed his plane went down?

RF: Yes, Yes. So, you know, there are a variety of things like that. Boyhood friend in high school joined the Air Corps, flew P-40s, I guess, they were fighter planes, in the African campaign. [He'd] write to me about flying around hillsides where the German tanks [were] and so forth. Ended up being a prisoner, escaped from [prison camp] in Italy. They caught him and worked him over a bit, and he finished the war in prison in Germany then.

EM: Wow, and he survived?

RF: Right, right.

EM: What did you know about what was happening in Europe, say in 1938, 1939? Did you know what was going on?

RF: Yes, pretty much so. And of course, the East Coast went on blackouts sometime in there. I was trying to remember this morning, because the fraternity manned a watchpost out on the ocean.

EM: In what town?

RF: I think it was around Asbury Park, somewhere around there.

EM: I'm from Long Branch.

RF: Yes, probably, probably somewhere in there. But at that time, the beaches had four to six inches of oil, and rumors that some Germans had landed from submarines. But clearly the Germans were sinking ships fairly well. And the coast was blacked out. It was really startling when I left school and went out to St. Louis where I started in Monsanto. There, lights were on all the time. And people in St. Louis couldn't believe that the East Coast was operating in the darkness.

EM: There wasn't the same fear?

RF: Oh, no.

EM: No. And what year would you have been manning the towers?

RF: Well, it was in the, I'd say the 40s, 1940, 1941. And there was a, I guess some hysteria started about potential landings. There were spots where people were on guard, if you will. I don't know what we'd have done if we'd seen a group of them. We didn't have any guns, although all of us had grown up with guns on the farm. But New Jersey was, that whole coastline through, there was spotters.

EM: Right, especially Sandy Hook, I know, was a big place for it. They still have the buildings and everything. So were you shocked when you heard about Pearl Harbor?

RF: No. Well, there'd been enough things going on to suspect something like that was gonna happen. So, of course, by that time the US was sending a lot of stuff to Europe. We were involved, even though we wouldn't admit it. So, no, I don't think it was any particular surprise. I think [there was] disappointment that people could be so dull as to get caught like that.

EM: Did you know where Pearl Harbor was?

RF: Oh, Yes. Even without TV, we managed to find out what was going on in the world.

EM: I'm sure.

RF: I think, moving on to Monsanto, all the chemical companies were hiring. I, personally, had six job offers. And even though I worked for DuPont [in the] summers, I had really wanted to go to a small company. At that time, DuPont was about 400 million dollars in sales, Monsanto was forty million in sales, and so I went with a small company. But, (Dow and Carbide?), all of the big names in the chemical business were hiring, they were being asked to run munitions plants, all kinds of explosives plants, and I don't know exactly when the Manhattan Project got started, but, again, the chemical companies were asked to take the lead in all of that.

EM: With the research?

RF: With the research and separation techniques that were required to get the materials. And of course, those of us that had been to college, well, then we knew work that had been done in Europe on the atom, and it's pretty straightforward, probably something was gonna happen. And let's see, I spent about a year in the lab. Summer, or the spring of '42 to '43, then I started working out in the plant, in operations, to get more production, more production. And we were known as troubleshooters, always creating change because we were trying to get more stuff out. We were all working six and seven day weeks, ten to twelve hours a day. But one Friday afternoon, my manager called myself and three other guys in and said, "You've got a special assignment starting Monday. There'll be a guy here. You do whatever he asks you to do. Any facility in this plant, you can take. Any people you want, you can have. It's an important project." And Monday morning we met this guy, he was from Dayton, from Monsanto, and told us what we were trying to get done without saying what it was for. And we had broken our backs getting a unit in operation, to make an anti-malarial needed for the Pacific. And after looking at what was needed, we decided we had to take that unit apart. I'd been named leader of the crew. And so, we tore it apart, did the job that we were asked to do. I guess it took us about six weeks, maybe more.

EM: Did you infer what it was for?

RF: Well, we were too busy trying to get it done to think about that at that time. But, at that time, we were in the Friday night poker playing business, and the four of us ended up at the same table one night. And one guy was from MIT, I was from Rutgers, a fellow from Chicago, a fellow from California. We had all had our physics and chemistry and so forth. We sat there that night, figured out what it was that we had been involved in and what was going on. And of course, the irony is that I ended up, thirty years later, running Monsanto's site that this work was done for. But we knew then that there was lots of stuff going on in this country that nobody knew anything about.

EM: Did it scare you?

RF: No.

EM: You had faith that everything would be fine.

RF: Sure, sure. No, we didn't have any of the concerns that people express today about some of these things. I think we've gone way overboard on lots of things, but you know, that's just one person's opinion. So, since all the asbestos, dioxins, it's ridiculous. And to feel for how people use some of these things, asbestos, during the period that I was chairman of the Board of Directors for the United Way here, we were going to do some renovation work of all the furnace systems and asbestos insulation, so we told people and we told them we'd let them know when they were going to go to work. Well, one day the contractor put up a sign saying that he was getting ready to go to work on it. That afternoon, we had women fainting, men all upset and nobody had touched the thing. They had simply seen the sign, you know. It's too bad that we've not done the educational job that we should to make people understand these things.

EM: Right, they're just scared.

RF: Yes.

EM: From what they hear on the news. So, when did you know it was called the Manhattan Project?

RF: After the bomb was exploded.

EM: Right.

RF: First time.

EM: And you realized your role.

RF: Yes.

EM: Were you shocked when the bombs exploded?

RF: No, because we had figured out that's where they're headed.

EM: And was it about the time you thought it would be or did it come quickly?

RF: We hadn't thought, we hadn't thought about the timing. We were just, again, we got that job done and we were back trying to make the anti-malarial and clean the place up. Make the anti-malarial and move on, Monsanto was putting a plant together to manufacture some anti-gas, poison gas materials. And they were involved in another plant to make oil additives, to get better operations out of our planes. So you're just too busy to spend time trying to put something like that together.

EM: Right. It seems the focus of your job is still always the war effort.

RF: It was. Well, the whole country was aimed in that direction during that time frame. And then after the war was over, then the country was aimed at fulfilling the needs of, you know, people couldn't buy cars, you couldn't get tires. We had, of course, obviously meat rationing. Bert and I got married in November of '42, and I remember that we used to go down to market in downtown St. Louis, and you'd buy a tongue because it was not part of the rationing system. You know, it really was very decent meat. But, you know, those kinds of things. I don't think anybody remembers anymore.

EM: What other differences were there between coming from New Jersey and Rutgers to going to St. Louis?

RF: Well, I think the people in St. Louis were, probably didn't feel as close to danger as people on the East Coast did. They certainly were, obviously, clearly involved. McDonnell was building fighter planes. So, again, you know, everywhere was, do whatever was needed from the standpoint of the war. Certainly, St. Louis was a lot hotter than the East Coast, and the weather's kind of warm. Then, there wasn't much in the way of air conditioning around, in those days. I don't know, but other than that I don't see much difference.

EM: Where you excited about the move?

RF: No, just go to college to get an education, then you go to work somewhere.

EM: Right. Did your wife come to St. Louis with you?

RF: [Yes].

EM: And you were married there?

RF: No, well, we went back to New Jersey. I went to New Jersey when we got married. I had three days off from work.

EM: Big honeymoon.

RF: Big honeymoon, Yes, on the way back on the train. Then she went to work at Barnes Hospital. She had ended up running a so-called “gold coast” at the University of Penn Hospital. It was where the folks who had the money to pay the hospital bills went and they ate off of china and that kind of stuff. She was head nurse in that operation, so she got a good job at Barnes right away. She was [going on] a unit from University of Penn, physicians and nurses who were headed for India and Burma, the Burma Trail? Burma something or other? It was the route that we were using to fly material in to help the Chinese as well as go after the Japs. But we decided to get married so she decided she wasn't going to go to India. [Just] to St. Louis.

EM: What were the feelings in St. Louis towards the Japanese and the Germans? Would you say they were the same or did people have more hatred directed towards the Japanese?

RF: Probably was more towards the Japanese. You know, they hadn't really played square when they wanted to start the war. The Germans did, if you could play square to start a war. Plus, St. Louis had a big German population. Big German population all throughout the Midwest, Cincinnati, was started by Germans, a lot of Germans here in this town. So, it was really the anti-Japanese, but again, people were so busy that they didn't have time to sit around and debate these things.

EM: Right. When did you hear about the concentration camps and the atrocities?

RF: I really don't, really don't know. Certainly knew about it after the war, but I, I don't know that we knew anything about it during the war.

EM: And what would you say the feeling was when Japan was bombed? Were people feeling relief?

RF: Well, Yes, because, oh, within three or four days, one was dropped, then another one. The Japanese surrendered so we were happy the war was over.

EM: Did you have any ambivalence coming from a Quaker background and then working towards the war effort?

RF: No, no.

EM: And had you converted to Presbyterian because of your wife?

RF: Oh, Yes.

EM: And you were married in a Presbyterian Church?

RF: No, no. We were married at an aunt's home. So, no, we, I guess we were not that strong a Quaker family.

EM: So you stayed with Monsanto for your whole career?

RF: And was lucky enough to be able to grow with it as it grew. I don't know how many different jobs I put in my resume, but it seemed like I was always moving. And, in the long time we were in St. Louis, I changed jobs about every eighteen months. I did a variety of things. Ended up being assistant director of research, then director of research for the division. And then that division was involved with detergents and phosphates. And in fact, you probably don't remember anything about foam on rivers problems.

EM: No.

RF: Well the ingredient in Tide and the other products, at that time, was a molecule that the bacteria could not eat because of carbon linkages. And we had some relationships in Europe and I was in Europe, one of my periodic trips up there, came back [with] pictures of foam on the River Seine about five feet deep, right below one of the dams there. And we'd been kind of doodling around in this area because we were a big producer of it, and convinced management that we should do something about it, see if we could come up with a different molecule. And there were things going on in Europe, so we knew kind of the direction that was useful. And we ended up putting a new molecule together, patented technology, building a new plant in Texas, and went from number four in supplying the active ingredient to number one in a matter of months because of that activity and, again it's a matter of how you do your research.

EM: And were you rewarded for all of this?

RF: Well, maybe I was. I was made director of the organization. But moved on to other jobs. I spent some time running Monsanto's computer activities worldwide. Interesting assignment, in fact, it came right after this plant's startup. Got called in by the president of the company and [he] said, "We've decided to combine three organizations into one and you're going to run it." And I knew some of the problems because we had our financial operations on computers in one department, we had our technical computing and, even at that time, we had online technical computing firm, scientists. Probably one of the early companies.

EM: Wow, what year was this?

RF: Probably about 1960 to 1965, somewhere in there. And had all of our order entry coming in by teletypes and paper tapes and we had machines on one side of the room where orders would come in on paper tape. People were supposed to take that paper tape and put it on the bank of machines on the other side of the room to go to the plant, where it was filled. Well, sometimes the paper tapes got in the wrong slot, sometimes they just disappeared. So, he said "We'd bring all that together in one organization," and, well, [he was] pretty wound up about it, he said, "Straighten the goddamn mess out." So that started me off on about two and a half years of

pulling all of the computer activities together, consolidating, moving stuff from Europe and St. Louis and the rest of the US. And really, I continue to be concerned about it because, basically, the computer networks that we put together during that time, we still use them today. We were one of the first companies to move data from England over to Brussels at night and manipulate it there and send reports back so it was on people's desks the next morning, that kind of thing, and that's a rare thing to do in those days. I went from that to the electronics activity and I had, again, kind've got caught in some of my own activities 'cause when I was on the Inorganic division ...

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RF: The Inorganic division had decided to move into electronic chemicals with the first target, single crystal silicon. On one of my periodic trips to Europe I was asked to stop at a major research facility in Germany to review their work on silicon. This work was being sponsored by our English company, therefore all was available to us. I had been in Europe for four weeks before this visit and my German was in excellent condition.

They asked me if I wanted an interpreter and I said yes. Why I will never know. By 10 AM I realized that they were discussing, "Should we tell him this?" Needless to say, I continued the routine of not understanding German all week! I would write notes at night on the technology.

EM: They had no idea?

RF: No, no idea at all, apparently.

EM: What was the difference between what they were telling you and what you had heard?

RF: The key technical points.

EM: Really?

RF: If I had taken what they were telling me in English, we would not have been able to go into the business the way we did. I came back, and again this was in my own department, and working with the, some very talented people, we put together the, duplicated the process they were using, then went on and built the machinery to make a single crystal silicon. At one time we were the major supplier to IBM, I knew the people at Intel, who are now the big guys in the [micro]chip business, Motorola and the rest of them. So that was during the days when things were really growing in the electronics area.

EM: Monsanto turned into a huge company.

RF: And then after that, why, I was asked to come over here and take over Mound Laboratory, which is where the Manhattan Project was. And by that time, we'd grown to be about 1800 people, something like that, and we went through our ups and downs but, again on that job I was travelling to Washington, Los Alamos and Livermore, as well as Albuquerque, which is where

the headquarters were for the entire weapons complex. And it wasn't completely new territory to me because I had been on a technical committee that Mound had used for about five years, so I knew a lot of what was going on, but not everything. And it was around cutbacks in the nuclear system, Mound's being cut back sharply, but I think it's served its purpose and I hope we don't ever have to use one of those rascals.

EM: Right. What sort of projects were at Mound?

RF: Well, making components to go into nuclear weapons, ones [I] can't talk about, we're involved, were and still are, involved in the space program. The units that sit on the Moon, generating electricity, but the instrumentation that's up there was all made here at Mound and the, what you do is take the heat that's generated by the decay of radioactive materials, take that heat and through thermoelectric technology convert that to electricity, and then you run instruments and that sort of thing. So, Mound's been involved in all of the things that have gone on in space, the Jupiter flyby, and we're still making thermoelectric generators for future space projects. So, really, kind of a broad spectrum, all of it dealing with radioactive materials.

EM: How much was Mound affected by the defense cutbacks?

RF: Well, at the time it started, the real cutbacks, I had to go through one cutback, take it from about 2,000 down to 1,500, then we got two big new jobs in there, and it went back up to 2,500. So there were 2,500 when these cutbacks started, there are now less than 1,500. And I suspect they'll cut us another thousand in another six months or so.

EM: Would you say the focus is switching from research and manufacturing to testing?

RF: Well, they've still got the space program, the focus is switching from making components to continue to test the components that have been made previously because we've got so many of these monsters around, but you've got to keep testing to make sure they're still good, and it takes some very talented people to do that job. I'm not sure where Mound might ... end up in, by the year 2000.

EM: Are most of the contracts from the government?

RF: They're all from the government.

EM: All from the government.

RF: You know, the way the world situation is today, say, things are peaceful and then tomorrow, we can be in deep trouble somewhere. I don't know where this Bosnia thing's going to go. I think we'll get involved in it before we get all through.

EM: You do?

RF: I think we'll be sending ground troops in.

EM: Wow, I hope not. If something like that happened, do you think that defense spending would go back up?

RF: No, I don't think so, because, first of all, we've got so many nuclear weapons that we really don't need to make more. Secondly, I don't think we would use one in a place like that. I mean, the only reason you'd use it is if you're figuring that you're going to lose so many more people by not using it. And the thing that I think a lot of folks forget, what you're seeing today is the firebombing that went on in Europe, firebombing that went in to Japan. Actually, I saw something the other day that would indicate to me that we killed more Japanese with firebombing than we did with atomic weapons.

EM: I think that is true.

RF: So, it's not a pleasant thing no matter which way you look at it. Now, I hope we have sense enough but I haven't seen anything that makes me think that mankind is any smarter today than it was. Still got a few nuts around and we've got a lack of wise ones. That's our problem in Bosnia. That thing could have been stopped during the Bush administration if we stood up, but we didn't.

EM: Does Monsanto do any research in conventional weapons?

RF: No. Of course Monsanto's no longer running Mound. No, it's turned over to EG&G in, I guess, about four years ago or five years ago. And again, it's one of these things that's too bad. I used to spend between Christmas and New Year's, every year, either on the phone or in St. Louis talking with our attorneys about what to put in the upcoming report to the stockholders. The stockholders can make proposals and things, and there's a group here in town that own about fifty shares of Monsanto stock, they work with the group of nuns in St. Louis who have about fifty shares, and each year the group would come up with another proposal, something to do with Mound, and the company has to respond to those types of things. And Monsanto simply got tired of putting up with that nonsense, 'cause they got beat every year.

EM: What type of proposals?

RF: Well, one year, they proposed to shut the place down, which wasn't ours, we couldn't shut it down if we wanted to, it wasn't ours. One year, in the previous fall, *Popular Mechanics* put out a series of articles about how the Japanese were working with ceramics and going to make ceramic engines. Well, we were doing work on ceramics, here at Mound, [with] more mass than what the Japanese were doing. So they proposed that we convert Mound to making ceramic engines. That didn't do very well. And you know, it just takes a lot of energy and takes top management's time and we weren't making that much money out of it anyhow, 'cause all we were getting was a management fee, a couple million dollars a year, and we just got tired of putting up with it. But management, who had been involved in the Manhattan Project from the very beginning, who had called in by Groves to do a particular job, had all retired. So, you know, there's no emotionalism,

about how we really ought to keep doing this just because we did it, and so the decision was made to get out. Of course I had retired by then so it did not effect me personally.

EM: Were you sad to see it?

RF: Yes, I mean there were a lot, of course, I know a lot of people, and there are a lot of people being hurt now by it. By the way the cutbacks are being handled, but it's happening everywhere in the (?) business, so, again, you can't take the view, ... "You've got to keep me going and never mind anybody else." Let's hope, in our cutbacks of the defense business, we don't cut too far. That's what happened to us in the '80s, or, I'm sorry, the '70s, during the period when I was involved in it. Carter was president. He was telling the American public that we were not doing anything on the H-bomb, he was lying through his teeth, making them faster than they could count 'em. So, you know, you have to develop a certain amount of cynicism about what the politicians are gonna do, what they're gonna say. I thought Carter, for one, would tell it like it is, but he sure didn't.

EM: Was the industry nervous when Clinton was elected, with the cutbacks he's proposing?

RF: No, not the, let's say it this way, the thoughtful people I don't think were, because the top managements in all of these sites know the numbers and know where stuff is. No, we've got a hell of a lot more than we would ever use, ever dare to use, so somewhere you've got to say, "Enough's enough."

EM: Were there any protesters outside of the Mound?

RF: Oh, I guess we had a couple of times. We were one of the few sites that did not run into that problem, and the DOE people and the atomic energy, before that field, a lot of that was the way we were handling the place. When I came over here in fall of '71, now, it's a very mysterious place, everybody knew there was something there, and they knew they were involved in nuclear weapons, but it was all very mysterious. And there was some concerns about radiation and I ended up making decisions to, in essence, take it public. We published the environmental data we were gathering, we established the environmental measuring sites in public buildings around the area and shared the samples with the people, so there was no way we could play games on what the numbers were, and invited the press in, showed them the things that we could show. Showed them the people working with radioactive materials were not monkeys and they didn't have horns and tails and they really were pretty, fairly responsible group of folks. And [we] offered to work with the media on any problems, questions they had. They took us up on it and so we really did build a good relationship with the community, and the community didn't put us out much in the way of protests. The two groups that I talked about earlier tried a couple of times and, you know, they took twenty-five people and that was about it. So, we were fortunate and really had, I guess, certainly the best direction in the whole complex. There were about eight sites across the country where these sort of things were going on, dealing with the weapons, and some of them being run very well, some of them not being run well. So, those not being run very well were the ones that really got the flak.

EM: It seems that you really enjoyed your choice of profession and experiences.

RF: Yes, very much so. And [I'm] very lucky. Fortunately I was able to, as I say, grow with the company. [When] I left Monsanto, it was over \$6 billion in sales. That's a pretty decent pattern from \$40 million when I started with it. And [I] worked in a lot of very interesting jobs. So, I had decided to stay here, in Dayton. We have four greant children. We have our twins, a girl and a boy here. Our girl is here, [our] son-in-law works at the base in metallurgy. And our son is in Cincinnati. And another, second daughter, is a physician in New Haven, graduated from Yale Medical School and the oldest daughter, who we made the mistake of letting her go to the Northwest for graduate work, and lost her, ended up in Portland, Oregon. Beautiful country. So, wherever we, if we were to go back to St. Louis, or any other place we'd be travelling, anyhow, and I was involved in the community. And I'm very fortunate that [I] ended up chairing a variety of organizations in this town. And probably one of the most interesting ones was a period I spent with Miami Valley Hospital. I spent about eleven years on the board, about three years as chairman of it, and it's one of the top one hundred hospitals in the country. Seven hundred beds, a big complex. So, I got my exposure to the health, some problems in the healthcare industry. Chamber of Commerce, still involved in military affairs, [I'm] chairman, now, of the Head Start Program here in town, Economic Development Group, on board for the city. My wife has been of tremendous support through all these years.

EM: You're very busy.

RF: Oh, I'm too busy to take a vacation. We've been talking about going to Oregon in August, and I haven't been able to scratch out the time to do it.

EM: You've been there before, though?

RF: Oh, Yes, Yes. We get out there at least once a year. In fact, I happened to have been there the weekend that St. Helen's blew. I had been to Livermore and then I went on up to Portland for the weekend. And I woke up on that Sunday morning with white ash. My daughter is a potter, also heavily involved in gardening, and we looked out in her yard and it was covered with ash. So, [I] was scheduled to fly out later that morning and called the airport and [they] said, "We've canceled all planes." So, I got ahold of Amtrak, and I think, I must've been talking to Washington because they didn't know there was any problems. They were running trains from Seattle and Vancouver down to San Francisco and LA, and I figured, "Well, I'll take a train down to San Francisco," and they assured me, "No problem." They called me back about an hour later and said, "We're shutting the trains down." So I finally got out of town on a bus and went down to Eugene and flew out of there. But we had been on a picnic at the little lake which disappeared in all of this, the summer before. We have pictures of it. And I've been trying to get back out there, fly over, and the time, every time we've been there, it rains. That's the problem with Portland, so I have not yet flown over St. Helen, but I'm going to do it one of these days.

EM: Do it in the summer.

RF: Yes, Yes.

EM: I just had a few more questions about during the war, in a fraternity, I guess, you saw the reactions of everyone. Did you see a lot of people running to sign up or waiting to graduate? What was the general attitude toward enlisting?

RF: I guess it was probably mixed, as you would expect. Remember, I don't know whether Rutgers still has it or not, we had ROTC there, and folks who, the first two years were compulsory, and then you could decide if you want to stay with it, you could come out and be a lieutenant, and those that were in that program were encouraged to stay and get that gun, rather than jumping in, which, then they just ended up as a non-commissioned officer or no degree. So I think they were encouraged to stay. Those of us who were in technical activity, chemistry, physics, engineering, a variety of kinds, were encouraged to stay. They didn't, I don't recall any case of, I'm talking about the fraternity brothers, of the guys waking up one morning and say, "Hey, I want to go and enlist." There probably were some, but I, I don't think it was any mass movement or anything like that. And, let's keep in mind, we were, the US was not involved until the end of '41, so the bulk of the time was before we got in. Now, what happened after the war started, I don't know, but again, we never did have a graduation exercise. I think [I] left in the middle of April to go to St. Louis, when I should have left in June, so things were shortened up and people went on their ways.

EM: Was it a type of, if you were in a technical field, studying a technical field, was it known that you would stay on the homefront and work here? How was it dealt with? Did companies start contacting you?

RF: They didn't contact you 'till you were a senior. But it was pretty well accepted that if you were in the technical fields, the odds were high that you would not get involved in the military. There was no particular increase or decrease in enrollment in those days that I remember. In chemistry, for example, our first day, the dean of the school, old curmudgeon who was dean at the time, Dean Read, the usual story, "Look on either side of you and only one out of three of you are going to make it out of here." I don't know whether they still tell that story or not.

EM: Well, I know chemistry is still one of the tough courses.

RF: And he wasn't kidding. It was a little tougher than that, actually.

EM: I'm sure. How many graduated in your major, do you remember?

RF: Probably no more than twenty.

EM: Wow. Wow, that's small.

RF: And I, I think, again, in the, and I'm sure I'm biased on this, but I think that the courses that we took and the rigor of them to get our BS degree was probably as good as a Ph.D. is today. You know, I think the whole educational system downgraded itself. So, we used to get open book quizzes in quantitative analysis, tell you the question, the answer's on page so-and-so and they'd tell you to figure it out. They were some of the toughest ones on there.

EM: Was engineering the same way?

RF: Pretty much, pretty much. They had a good ceramics course there. Bill Bauer, who I think is now retired, was a classmate and he ended up dean of the ceramics school.

EM: He was interviewed, I believe.

RF: I'm sure he was. He, I think, he's one of the leaders in the group pushing this project. Bill's an interesting guy.

EM: What about going to Europe, when did you first go to Europe?

RF: In the '50s. At that time, we were, before jets, we flew, stopping in Greenland for refueling and again, it was because of the relationships in the chemical industry. We worked with the Germans and English, Monsanto had several plants in England, three of which were involved in technology that I was involved in, so I always went to them. Pechinay manufactured elemental phosphorus in France, as Monsanto did in Tennessee and Idaho, and we had a technology exchange agreement with them, so I visited with them. After being placed in charge of computing worldwide, this caused the need for trips to our European operations, to review and upgrade computer operations. After being placed in charge of the electronic activities, trips to Israel and England were required. The commute to Israel was a tough one.

EM: Fourteen hours?

RF: No, at that time, it was thirty, thirty-two or thirty-three hours. [I] always arrived absolutely dead tired, and our Israeli partners would want to negotiate. And they finally got the message, understood, and believed me when I said, "I do not want to do that, and I'll negotiate with you tomorrow. I'm not going to negotiate tonight." But that, I started that about twelve months after the war, '67 War or '68. And we'd go through military checkpoints and there were still burned out tanks on the road between Tel Aviv and Haifa. And that's an amazing story. We had our plant over there, making fibers, and never lost a pound of production during the whole war. These people would come in, do their work, eight hours, get some rest, go out and spend eight hours in the battlefield, come back and work some more. One story, though, the personnel man who was putting together a human resources manual for his organization and he had manuals from various parts of Monsanto, he was down on the Suez Canal on guard duty and had gone up, spread the stuff out on the top of the bunker, or bunker nearest, anyhow, and a shell came over and knocked all of his papers everywhere. He managed to escape and he thought it was a big joke. We were in the electronics, electronic instruments. The area that I was [in] involved,

voltmeters and a variety of things and, at that time, I guess it still exists, there was a so-called "blacklist." If you're involved in Israel, you can't sell anything to the Arabs. ... The people in the operation took great joy in the fact that the instruments they were making would be sold into Greece or Turkey, someplace like that. Labels changed, the Egyptians would buy them. The Egyptians were using them to do maintenance work on their aircraft, which were coming over and bombing Israel. They thought it was a great, great joke. And I was involved in, during the same time, involved in a major acquisition Monsanto made in the value and instrument business. And the people that we were going to merge with were major, major suppliers to the oil industry in the Near East, and because of Monsanto's own blacklist, they were afraid that they'd lose all that business. So I talked to the Israeli people about it and they said, "Well, here's what would happen. Rumors would get started of a potential merger, so your orders will go way up. And when it is announced, there will be lots of yick-yack, but no action. They will not give you any orders for eight to twelve months. Then they'll come in with orders twice the norm." And I took that story back and people said, "Oh, that makes sense," [and] went on with it. It's exactly what happened.

EM: Really?

RF: I know to this day, the Israelis spread some rumors into the Arab countries, 'cause their orders were going up by the time I got back to the States. And they stopped, then they couldn't make stuff fast enough. So, it's a different way of doing business over there in those countries and I don't think that most Americans begin to appreciate it.

EM: What people say is not always what you hear.

RF: Right, right.

EM: After the war, when you were working with Germany, was there any ambivalence towards the company?

RF: No. The American industry went in and literally took, stole all of the technology they could get their hands on. The chemical industry really went in because the Germans were very good at chemistry. [They] had some fascinating technology and, in fact, one of the products that we were making in St. Louis, we got some technology input and checked it out and looked it over and it was very nicely built, so we built one. And the Germans knew that was going on and, of course, a lot of the German top technologists were brought over here. Dayton had a lot of them, people were involved in the rocket business, missile business. The fellow who built the V-2 engine that they used so much on the British, the V-2 rockets, was brought over here.

EM: And what year were they brought over here?

RF: Probably '46. It was all done very fast, they didn't mess around, didn't have the variety of bureaucrats telling them what to do. They went in and moved. In fact, he's just retired from the University of Dayton, he was on the faculty there. And we got a model, one-third size of the first

jet engine that he built for the Germans, at the Engineer's Club. That's another organization that I'm chairman of the foundation there. So, I'm sure that some people were upset about it but, you know, Americans can be pretty tough when they decide to be. And I think it's part of our problem today. We're not willing to stand up and be counted the way we did in those days. But I'd say the only strange thing that happened, I was over in Germany about ten days.

EM: November, 1989.

RF: No, it was some other event. But at any rate, it had something to do with Berlin, maybe the Wall had just gone up. At any rate, we were twenty miles from the line between East and West Germany and, during lunch, I thought, you know, I'd like to go see what this border looks like. There wasn't any of them who wanted to go anywhere near it. They wanted no part of that, so I never did get to the line. But, well, Monsanto, for example, had had operations in England since about 1920. We had partners in operations in Japan from the late '20s or early '30s. So, well, we, the company had been of an international bent for a long time. I mean, one of the places I went to quite a bit while I was director of research of this particular technology, was Italy. We had joint ventures with the Italians. It's always interesting, we had put in that plant the latest in instrumentation, big, long instrumentation panel, and you go by the plant entrance, a little Italian home with manure piled up out front. So here you have manure in the front yard and you have this very modern complex and the Italians had a little trouble trying to handle some of their technology. And I, I can understand. But it's always interesting also to go to that place.

EM: Where in Italy was it?

RF: Either in Montova, it's about halfway between Rome and the Northern (Tier?), it's a little towards the Northern (Tier?), it's on the western side. We had built, with the Italians, we had built quite a chemical complex there, and we also, there's another complex over near Venice which didn't do as well. But we were in the plastics with them, fibers with them, detergent. [Very] active with them.

EM: Monsanto was all over the place.

RF: Yes. So it's kind of interesting to hear people talking about the international scene these days [like] it's all something new. A lot of companies have been around a long time overseas.

EM: It's true. See how they were affected by the EU. Well, what else? Anything else you can remember from Rutgers?

RF: Well, you know, the interesting days of crew.

EM: Was that like a fraternity? I know it is now. Very close-knit.

RF: Yes, it's a close-knit group. You know when you've got eight people all putting an oar into the water at the same time, and if one of them misses by a fraction of a second, you've really got

your problems. So, I don't think there's any feeling quite the same as an eight-man crew, really. It really is pulling together. A shell practically floats on water, really skims the surface under those circumstances, somebody gets a crab and the whole baby goes under. I guess it is a, I hadn't thought about it that way, a really close-knit group. But the afternoons out on the river, while my classmates were busy in the labs running the stuff I had set up, and sometimes we'd go out early in the morning, six o'clock in the morning, and row.

EM: Good lesson in teamwork.

RF: Yes, very much so.

EM: Rutgers was a lot more strict when you were there then nowadays, obviously.

RF: You mean the dress codes and that sort of thing?

EM: Everything, all the rules.

RF: Well, now, Yes, I guess we had them but I don't think we really realized it.

EM: No. Did you feel that you had your freedom once you went to school?

RF: Oh, Yes. Sure. I had been, I worked the whole time I was in college. I guess that would have been my senior year, when I put enough money away that I really didn't have to work. I had a variety of part-time jobs. Didn't have the time to play around like some folks did. Plus taking the heavy technical course I was in. But it was fun.

EM: You had a good time. Anything else about the war that you remember?

RF: No, I don't, I don't think so. I guess we were all so busy that time. I didn't take the time to sit down to worry about whether we should or shouldn't. We used to have some great debates in St. Louis with the first apartment we were in, and two or three writers from the *St. Louis Post Dispatch*. And we'd get into some great debates about, they really don't sign this stuff they write, 'cause they wouldn't mix fiction and half facts and partial fact and a fact and, a very liberal newspaper at that time, still are. And we used to, they used to give one guy, in particular, a hard time. The fellow that could really kind of take it was a music critic, so there wasn't much we could do. He knew that was all opinion. anyhow, but I got, I guess the, probably one other thing, the difference in the sensitivity of the people on the East Coast to potential air raids or landings from the sea, much more sensitive than people in the Midwest. People in the Midwest were completely removed from anything like that. They were not living under the blackout period, so it was certainly very different.

EM: Was the interest in what was going on in the war the same?

RF: Oh, I think so. There was no difference in the expected jobs to be done, there was no difference in the rationing system, etcetera.

EM: Were there any forts around St. Louis?

RF: Sports?

EM: Forts.

RF: Forts. Yes, Fort Leonard Wood, the major point for troop assembly, so a lot of troop movements through St. Louis railroad stations. Lots and lots of them. Fort Leonard Wood, I think, was probably bigger than (Kilmer?) is, New Jersey, Yes. And a couple over on the Illinois side of the river.

EM: Did you see a lot of soldiers in St. Louis while you were there?

RF: Yes.

EM: Well behaved?

RF: Yes. They were either headed home for a few days or they were headed for overseas. Either one would make you kind of pay attention.

EM: Okay, well then, thank you very much.

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