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JABALLAS: Okay, so...

NEAL: So I worked on the byproducts side and I started as a research chemist. ... Later, after a couple years I was promoted to a group leader. ... Then two or three years after that I was promoted to product development director.

JABALLAS: Product?

NEAL: Product development director, mm hmm. We didn't say research because Georgia Pacific was not a very research-oriented company. So nobody wanted to call attention to the fact that we had a group going in Bellingham, okay?

JABALLAS: Okay. So your position held at the GP plant was?

NEAL: Well, the last position and the one I held the longest was director of product development, yes. I was promoted to that position in 1976, I think, which put me in charge of all the product development science and also some technical service and also some market development work. And I did that until I left the company in 1992.

JABALLAS: 1992, and is there any other relevant information?

NEAL: No, I don't think so.

JABALLAS: Yeah, I think this is pretty good. Okay, so alright, so I already got your name down and, let's see, you were born in Aliquippa, Pennsylvania in 1940. So were your parents from Pennsylvania, too?

NEAL: They were.

JABALLAS: Did they grow up in Aliquippa?

NEAL: They grew up in the Pittsburg area – that general area which is where Aliquippa is, yeah.

JABALLAS: Both of them?

NEAL: Yes.

JABALLAS: Okay, let's see, so what were their occupations there?

NEAL: Well, my parents were not middle class. I saw that as a question. My parents were pretty poor. My mother was a housewife, I guess you would say, raised four children, occasionally worked in grocery stores and things. My father worked in the steel mills in the Pittsburg area for a while. He... worked as an ironworker for awhile – that's high construction, assembly of buildings. His passion was being a farmer and I grew up on a farm in western Pennsylvania... not a very profitable farm I would say, but anyway...

JABALLAS: What was their education background? Did your...

NEAL: They both finished the eighth grade.

JABALLAS: ...and you said your mother had four children?

NEAL: Yes.

JABALLAS: You were the youngest?

NEAL: Yes, youngest, yes.

JABALLAS: Okay. So could you describe your childhood a little bit?

NEAL: We moved from the Aliquippa area up to the farm which is about a hundred miles north of there up towards Erie in 1948, okay? So I was in the second grade. We actually moved when there was still a little bit of time left for me to finish the second grade... moved to that school there. Both of my brothers had left home by then and were on their own, my sister had only one year of school left, so I was the youngest by quite a bit. So I grew up pretty much alone in the sense that we lived out in the farm. There was not much opportunity to participate in school activities after hours because I had no way to get there, you know? Yeah. So I grew up kind of alone, and I was never particularly good at most sports. The one thing that I could do was run. In high school I did a bit of that. But I excelled always at the scholastics, and so I guess you could say that was a way I could get attention, so I worked hard at it.

JABALLAS: Mm hmm, particularly science then?

NEAL: Maybe the most important person in terms of my education was a guy named Jim Jaspers who was my high school chemistry teacher and also my high school physics teacher, and he really got me interested in science and he knew he did. He knew he had an avid student and he encouraged that.

JABALLAS: So after having him as a teacher did you know you wanted to go into something science-related or science-based?

NEAL: I did. I think I decided then that I wanted to be a chemist, it just took me a while to do it. And, you know, I... the first thing I wanted when I graduated from high school was to get the hell out of the house, and I did, and I was kind of a bum for a year or so, I think. I learned to shoot pool though, really well, and then I got a job as a lab technician in a company called America Viscose Corporation in Meadville, Pennsylvania.

JABALLAS: How do you spell that?

NEAL: American Viscose. V-i-s-c-o-s-e. It was a company that made a material called cellulose acetate and it was used for making clothing. It was a light, soft, absorbent material. It was particularly popular for ladies' underwear, actually. It also had a couple of other uses and at one time it was used a lot in reinforcing automobile tires and then it was displaced by nylon which was displaced by steel belted tires. And it also, to this day, I guess, the biggest use for it is in cigarette filters, okay? That plant is long since closed down. But I worked there for a while in the lab and, as it turned out, by sure coincidence – and it didn't mean a thing to me at the time – but cellulose acetate is produced first by taking cellulose and reacting it with acidic acid... and it takes a special kind of cellulose. In order to ensure a supply, American Viscose had gone into partnership with a company called Puget Sound Pulp and Timber to build a pulp mill in Ketchikan, Alaska, specifically to produce the kind of cellulose that was needed to make cellulose acetate, and, of course, Puget Sound Pulp and Timber was acquired by Georgia Pacific and that was the plant that I later wound up working in, okay?

JABALLAS: So that was still in Pennsylvania, right?

NEAL: Yep. Meadville.

JABALLAS: You said went to... You got your college degree in Eastern Washington. How did you end up going from...?

NEAL: Courtesy of the United States Army. We had something called the draft in those days, and it never occurred to me not to go and I got to thinking that that was a convenient time to go. I had just turned twenty-one. They weren't drafting people until they were about twenty-four, twenty-five, but I thought, "I might as well get this out of the way now." So I just went down to the draft board and said, "Would you draft me?" And they said, "Of course, we'll draft you next month."

JABALLAS: So did you see it as kind of a way out of Pennsylvania?

NEAL: Well, it was a way to get that obligation behind me because by then I was starting to think about getting serious about growing up, right? And so I went to Fort Knox, Kentucky for basic training, and then in the wisdom of the United States army, since I was from Pennsylvania, they sent me to the state of Washington to do my duty, right? Because I had worked in a laboratory I wound up working in a laboratory for the army in Fort Lewis, Washington, south of Tacoma. We analyzed the food stuffs that the army, navy, air force, everybody in the sixth army area purchased, not just to feed the troops but

the stuff that sold in the commissaries. We checked cereal to see if it had the right stuff in it and we checked pork chops to see if it had the right amount of protein in it, checked milk to see if it had been pasteurized. And so I did that for... the total thing was almost two years.

And I started taking classes at night then. I think it was University of Puget Sound was offering classes on the military base at night. So I started taking classes then. And so then I decided I wanted to go to college and the army said I could get out of the service a little bit early if I was accepted at a college and, of course, the college said, "We'll accept you if you can promise you are coming." And all that takes is a lot of paperwork. So I thought, "I'd better not apply to a big school, I'd better go to a small school," because I could get that done quicker. Also, Eastern Washington State College was on the other side of the state. The two years I lived in Tacoma was the worst summer – it rained every day, every month, those were two bad summers.

So I went to... I applied to Eastern and I got accepted there thinking that I would probably try to transfer to Washington State or something after a year. But the truth is, when I got there I liked the faculty and I enjoyed the experience, so I stayed. And also they helped me all... Again, I had worked in the laboratory so long that on the first day of chemistry they said, "Okay, we are going to go in and show you how to use a lab balance." I went to the professor and I said "I think that was a [mettler?] balance you were describing." He said "Yes." I said, "I used to sit there eight hours a day running one. I could help people learn." [Laughs] And so, in fact, I wound up getting to be a teaching assistant when I was still a freshman.

JABALLAS: Wow.

NEAL: By then I was feeling pretty old and, I mean, golly, I was twenty-three. And so I was anxious to get on with my education and, in fact, the place where I worked back in American Viscose, they said, "If you come back here with a bachelor's degree you got job," because I had done some pretty good work with them as a technician, actually. And so I had some credits from being in the army that I had picked up..., and also, in those days you had to take physical education but if you had been in the army they gave you credit for that. Good plan. So I had a full quarter's worth of credits behind me and so, by going summers I managed to get my degree in two years and eight months.

JABALLAS: So you started in Eastern Washington what year?

NEAL: In 1963, in the fall of '63, in September.

JABALLAS: And you were done by?

NEAL: June of '66.

JABALLAS: And then you also said you got a PhD in chemistry from [the] University of Washington?

NEAL: So, June of '66 I went to the University of Washington. I had a grant there to pay me for the summer, and then I had what was called an NDEA, an N-D-E-A title three, I think – a federal grant that paid my expenses for four years. My expenses for four years [were] about three thousand dollars a year. In those days that was enough to go to college and live. Not live rich, but live. [Laughs] So...

JABALLAS: Yeah, at UW now the tuition now is five thousand just for tuition.

NEAL: They waived tuition as part of this thing. So every fall, every quarter they would give me a check for three thousand dollars and I would put... no, three thousand dollars in, I would put two thousand of that... all of it in the bank and I figured if I spent a thousand dollars a quarter that would get me through the nine months. And then [in] the summer I would try and find some other way to get money. Anyway, in four years I had my PhD.

JABALLAS: So in June 1970?

NEAL: Correct.

JABALLAS: And then did you go straight to Georgia Pacific after you graduat[ed] from the UW, or did you work other jobs?

NEAL: When I started at [the] University of Washington in 1966 I was part of the largest graduating school class they had ever taken in at that time, and jobs were plentiful in chemistry. Everyone was getting three or four interview trips and big offers. By the time I had graduated there was a bit of a recession and nobody could get a job, period, and I had really wanted to... My plan had been to teach in a small college. I had such a good experience at Eastern that I kind of wanted to, but there were no jobs like that out there.

So I arranged to do a post-doc at Washington State University with a fellow who was an expert in the field of chemistry I was studying named Ivan Leg. And then two guys came to see my professor. One was named Grey King and the other was named Jack White, and they were from Georgia Pacific, Bellingham. And they were interested in using lingsulfonate, the byproduct stream, as a chelating agent, a carrying agent for micronutrients fertilizers – the iron, the zinc, the manganese, things like that that plants need. And they didn't know anything about that area of chemistry at all. And they had just started searching for famous chemists in that area and they ultimately... were referred to Professor Norman Rose who was my professor at the University of Washington, because he was in the proximity. And he knew we were all having trouble getting jobs, and he knew that I sounded like the most likely person based on the research I was doing to be able to help these guys. Is that... OK. So he said, "The problem is, you guys don't even know enough about coordination chemistry to ask me the right questions. So I don't know how to be a consultant for you. What you need is for somebody to come in to work in your lab for a few months and do some experiments and try to define what the problem is." And they said, "Well do you know of such person?" He said, "I'll be

right back.” He ran down to me and said, “You have a job interview right now.” [Laughs] He said, “We are going upstairs and I want [you] to tell them the kind of chemistry you are doing.” “Okay.” [Laughs] You know? You’re supposed to be able to do that when you are at that stage. So I did and they offered me a job, a temporary job. I had this commitment to do the post-doc, and they offered a temporary job to come up to Bellingham and work for them for about four months.

So, I was married by then and had a couple of kids so we all moved to Bellingham for four months, and I did some work for them and wrote a report and went over to Pullman and did my post-doc. After a few months, why, Doctor Grey King showed up unannounced in my lab, said he and his wife were on vacation and he was just wondering what I was doing. So I talked to him about what I was doing and a couple weeks later I got a letter offering me a job... and I took it.

JABALLAS: At Georgia Pacific?

NEAL: At Georgia Pacific in Bellingham. So back I came. I started [on] the first of January in 1972. That’s how I got there. Long story, but...

JABALLAS: What attracted you to the job? Just...

NEAL: It was the only one I had that I knew I could get, alright? That was part of it. But the other part was I had worked there for four months. I knew the lab and I knew a lot of the people there, and I was also fascinated by the job because... See, in most companies, if you were working for Dupont, they say, “We make nylon and we want our scientist to work on is all the things you can use, you know. You know how to make nylon... better.” Georgia Pacific was different. They said, “Here we have this waste stream and we don’t care what you make out of it, just make something out of it.” Okay?

So you learned a lot about a whole bunch of different industries because lingsulfonate were being used in for such diverse things as drilling oil wells, to ordinary dust control on roads, to concrete add mixtures to make concrete stronger, to putting in car batteries to be bigger capacity, we were trying to make micronutrient fertilizers... there was a whole range of things and so you got to learn a lot about a whole bunch of different of industries. It was a lot of fun. It was still the greatest, in that sense, the best job I ever had. If you are interested in... science and curious about how things are made, it’s a great job.

JABALLAS: It’s a pretty good deal

NEAL: Yeah.

JABALLAS: So what was your position when you first started working there?

NEAL: I was a research chemist.

JABALLAS: Research chemist. How long did you work as a research chemist before you got promoted?

NEAL: Well, after about a year... I worked alone for about a year, and after about a year they assigned someone with a bachelor's degree to work with me to try to increase productivity, if you will. And then, after one more year – so I think in '74 – I was promoted to group leader. A fellow had retired and I was promoted to group leader. The way the lab was organized... there were three parts to the lab. Downstairs was the analytical lab and the second floor was a group of the product development people, and they mostly worked on things that were close to the money. We were working on real applied chemistry. On the third floor was another group and they were working on more fundamental research, okay? So I was put in charge of that applied chemistry group, and I did that for two years and... Grey King retired and they offered me the job.

JABALLAS: The job as?

NEAL: Product development director.

JABALLAS: Okay.

NEAL: So I had all of that reporting to me plus some, like I said, technical service people and market research, things like that.

JABALLAS: So when...

NEAL: Pretty heavy stuff for someone who had been there... I was thirty-six years old. [Laughs] Yeah, anyway...

JABALLAS: So, what exactly did you do as the director of product development?

NEAL: Well, first there was an administrative part that nobody likes to talk about but has to be done. You have to make out the budgets, you have to figure out who's going to get raises and how much, and all that kind of stuff. The obvious thing is that I had the final say over which projects we pursued and which ones we did not, scientifically, okay? So I would meet with people regularly, on a regular basis, in groups and also one-to-one, to discuss how their research projects were going and how we thought we ought to proceed on those. And the other part was then at that point you were also involved in dealing directly with customers, in particular the customers' scientific organizations. So I'm dealing directly with people with comparable jobs in the oil well drilling industry or the concrete add mixture industry or, you know, those kind of things.

JABALLAS: Mm hmm. And so you said... first you worked as [a] research chemist there and then you worked as product development director. What was your typical day like when you worked as a research chemist?

NEAL: Well, I was the beaker guy, right? Just like you think chemists are. I mean, they're mixing things in beakers and trying to figure out ways to produce some desired result.

JABALLAS: And as a director of product development what was a typical day like during that job, as compared to doing research?

NEAL: Well, [laughs] meetings, a lot of meeting, a lot of working on the budget, all those kind of things, yeah. The fun job, probably the most fun job, that was the intermediate one, the group leader, because now I have, let's see, one, two, three, four, five people I think, reporting to me. And we were flexible and we were fast, and we could marshal all our resources on a project to drive it for a little while, and things like that. And so it was... you could see results coming, right? So that was kind of fun.

JABALLAS: So when you started working at GP what was Bellingham like? The city?

NEAL: Smaller...

JABALLAS: How did it grow?

NEAL: Less diversification, probably. And... I want to be careful that you don't misinterpret... how I mean of it. But at that time Bellingham was about forty-five thousand people, I think, and virtually everyone had lived there almost all their lives or maybe had been there all their lives or maybe were second or third generation, okay? So I don't mean less diversified in the way that word is used nowadays, but it was tighter knit in terms of that. A lot of the people that I worked with and knew, their parents had homesteaded in Whatcom County and so... since then Bellingham is what, seventy, seventy-five thousand now, I think? But that thirty thousand people growth, some of that is from old stuff, but an awful lot of it are people who have come from California or someplace, right? Okay, outside.

The other thing: back in those days, the Canadian dollar was stronger than the US dollar, okay? So Bellingham would be forty or fifty thousand people during the week. On the weekend it would be like eighty thousand people and the difference [was] the people that came down from British Columbia to go shopping, okay? And so that was... You'd drive into the grocery store on a weekend and there'd be nothing but British Columbia plates on cars. [Laughs] You know? Yeah.

JABALLAS: Not so much like that anymore.

NEAL: No. In those days in Vancouver, there were bars where men and women couldn't go in the same door. They had a separate door for men, couples, and things like that.

JABALLAS: Really?



NEAL: And blue laws! You couldn't get a drink anywhere on a Sunday and things like that. You weren't allowed to sell cars on Sundays! So it's changed a little bit.

JABALLAS: What was the waterfront like there? Because I know the plant was on the waterfront.

NEAL: Yes.

JABALLAS: How did that grow and change over time?

NEAL: I don't think that that changed very much while I was there. The only big change in that happened while I was there was building the secondary treatment lagoon, okay, the one that is so... the future use of which is debated so strong. That was built about 1979, as I recall, and to it [laughs] there was a lot of discussion about that because the federal government had passed a law saying that industries *and* cities, industries *and* cities, had to be in compliance with secondary treatment standards by 1978, I think. But they didn't get around to saying what those standards were. That is, they didn't say what purity level you had to achieve, and Georgia Pacific, not unreasonably I think, said, "Well, we don't want to build this lagoon until you tell us what we have to achieve because otherwise we could build it, too, right?" But, nevertheless, they finally got around to providing the standards. They worked on the lagoon just as hard as they possibly could... but did not have it finished on time and paid a substantial fine to the federal government – several hundred thousand dollars I think – for being late, okay? The city of Bellingham was bound by the same law, but... ten years later they still had not complied with it but there was no fine for them.

The other thing that I remember about that lagoon was that the – and I'm trying to think of the name of the mayor who was... Ken... Ken somebody, I think – he went to go work for one of the developers afterwards. Anyway, when Georgia Pacific wanted to build that lagoon out in the bay, years and years ago, they had actually... when they had planted the city of Bellingham they had planted streets out in the bay, okay? And so, now you know they are never going to use those streets for anything because the environmental impact statement for draining the bay and using the streets would have been pretty severe. But, nevertheless, in order for Georgia Pacific to get this permit to build that treatment lagoon they had to get the city to vacate those streets, and the city only agreed to vacate those streets on the condition that Georgia Pacific make a significant donation to the Whatcom Falls, Whatcom Heritage Park down there. That's where that came from, GP paid for that. So they could get those underwater nonexistent streets vacated to build the treatment lagoon.

JABALLAS: So you said the future of the lagoon is being debated right now?

NEAL: The port would like to turn it into a marina. Some people would like to fill it in and turn it into a park. ... It's in the news. You probably don't read the *Bellingham Herald* like I do.

JABALLAS: Not very much.

NEAL: It's virtually in there every day, something about that argument going on.

JABALLAS: So what did the people in Bellingham, in the community, think of GP when you worked there?

NEAL: They fell into two groups. The ordinary citizens thought it was a heck of a good deal. It contributed a lot to the tax base of the city. It provided living wage jobs for twelve hundred people or something in those days. The other group was the people up on the hill at Western Washington University and they hated us. [Laughs] ... I think that pretty much sums up the attitude. That's one of the reasons I asked you.

JABALLAS: Did that opinion change over time or did it pretty much stay the same? Like the same people supported it?

NEAL: I think that pretty much stayed, although... But I'm talking about the students at the facul... at the university – not the faculty, at least those day. We had good relationships with the faculties. Some of us would go up there and give seminars sometimes. Some of them would come down and give seminars to my group sometimes. We were always... friends of the library, contributed money so we could use the library and things like that. So I think those relationships were always good.

JABALLAS: Okay.

NEAL: But there was... the seventies were a pretty radical time.

JABALLAS: Yeah.

NEAL: You know, I was at the University of Washington in the late sixties when the STS was active and [the] Vietnam War and all that stuff, and I was there when students, some of them decided to march from the University of Washington downtown on I-5 and shut the Interstate down.

JABALLAS: I heard about that.

NEAL: Yeah, those were exciting times.

JABALLAS: So how did the plant grow and develop over time?

NEAL: Over... while I was there?

JABALLAS: Mm hmm. I know you said the lagoon was being built, but anything else?

NEAL: I guess there was the... are you familiar with the alcohol plant? You know the story on that?

JABALLAS: I read a little bit about it.

NEAL: I hope I'm not going back too far... but two things in World War II. World War II caused the United States to realize two things. One: the way people drilled for oil and gas in those days. When you drill for oil or gas you have a pipe going down to the ground with a bit on it and you pump what's called a drilling fluid – it's a clay slurry – you pump that down through the pipe, through the jets, and up on the outside and that's what lifts the cuttings. If you want to make a hole you got to take stuff out of it, right? And that's what lifts the cuttings up. The rheology of that clay slurry – rheology is like viscosity and some other things – has to meet some pretty rigid specifications and the way people achieved that was by mixing in an extract from the bark from a quebracho tree. Now you don't have any quebracho trees around here because they grow in tropical areas, okay?

Well, during a war, shipping is in peril and things like that, and it became apparent to the United States government and the industry that their supply of... materials to enable them to drill for oil and gas was endangered. The other thing they realized was that the war machine ran on rubber tires, okay? And tires in the forties were made from natural rubber. You might notice that there are no rubber trees growing in the United States, so that was another thing that was outside their control, okay?

So World War II triggered a great deal of research effort in those two areas. It turned out Bellingham [and] Puget Sound Pulp and Timber before Georgia Pacific, played a key role in both of those. Drilling the... My predecessor, Grey King, who started that... who was hired to build that product development laboratory and another fellow named Carl Adolssen figured out how to make a product out of the waste stream, the byproduct stream – lingo-sulfonates – that would do not just as good a job as the quebracho extract but a better job. They invented a whole drilling system using that and they called that product Q-broxin™ because it kind of sounded like quebracho, okay? Q dash broxin, b-r-o-x-i-n.

JABALLAS: B-R-O-X...

NEAL: I-N.

JABALLAS: Okay, and this was the name of?

NEAL: The product that they invented, the trademark, okay? So that was one of the first big successes of that product development lab. The other one was, I said they needed to figure out a way to make synthetic rubber. Well, there were people all over the country... The department of defense had a huge program going on – you know, I was only six years old so I don't remember all these details – in Dayton, Ohio, by golly, right? – and one of the chemical roots to synthetic rubber that seemed to be very attractive utilized ethyl alcohol as a raw material, okay? Ethanol. So they became interested in non-traditional sources of ethanol. Sound familiar?

Okay, well, when you pulp a tree by the process that Georgia Pacific uses, that [the] plant uses... in the waste stream there is a lot of sugars, and the way you make ethanol is you ferment it with yeast – ordinary baker’s yeast, *Saccharomyces cerevisiae* – and it turns the sugar into ethanol and you distill it out. And in World War II, prior... everyone knew that. That was no secret. In fact the Norwegians and the Swedes were doing that during World War II to produce ethanol not for rubber but for fuel because they were desperate for... they didn’t have any petroleum... So the Department of Defense came to Puget Sound Pulp and Timber. I’m not sure why they chose that pulp mill but I suspect it was because they had a fellow working for them named Carter Watson who thought this was the cat’s meow as a place to live. [Laughs] And he later came to work and got a job at Georgia Pacific and worked there for thirty years or something, okay? Anyway, they built a plant to ferment those sugars into ethanol.

Well, the plan was that they were going to do this in pulp mills all over the country. They were going to ship all the ethanol back to a place back to a place called Marcus Hook, Pennsylvania, and convert it into synthetic rubber. So they built the plant... this was the first one. Shortly after that somebody figured out there was a better route to synthetic rubber that went through beaded ire. So they lost interest in that and so they sold the plant to Puget Sound Pulp and Timber for a song, I suppose, okay? So now we have this alcohol plant, but it did not produce... You’re wonder[ing] where I’m going, I’ll get back to you...

JABALLAS: Okay...

NEAL: We had this alcohol plant to produce about seventeen or eighteen thousand gallons of ethanol a day – poor quality, okay? – because if you don’t need high quality to do the things that they were planning to do with it... lots of impurities in there. So one of the things that happened while I was there is they upgraded... You said what changes? They upgraded that alcohol plant, increased the capability of the distillation and purification system to enable them to produce a variety of grades, including cologne grade, which is the highest grade of ethanol. That’s higher than you get when you go to the liquor store, right? The people making perfumes want no odors whatsoever in there, okay? We used to evaluate the quality of the ethanol with a panel of people who smelled it every morning.

JABALLAS: Wow.

NEAL: In those days your nose was a better detector of impurities than any of the analytical methods were, okay? So that was one of the big things that happened is they upgraded that huge alcohol plant to increase capacity a little bit, but mainly to increase quality. They still made some of [the] pretty low quality because when gasohol became popular, people wanted to buy ethanol for... adding to gasoline, and for that you don’t need all that high purity. In fact you don’t even like it. You’d like some of those impurities in there.

One of the things that happened [was] there was a company – and I don't even know the name of it – but a company, a trucking company got rich from us. He had a contract to haul wine from California to Oregon and to Washington in bulk to have it bottled, okay? Now I'll tell you what. The wine people are pretty damn persnickety about what's in that truck before their wine, right? So he was faced with a backhaul of empty, right? He would haul wine north and go south empty. Well then he found out we were shipping cologne grade ethanol to California. [Laughs] So he would haul wine one way and ethanol the other way and just got stinking rich. Good for him – it's because he deserved it – and we used to laugh when we saw those trucks coming in because he knew his reputation was important. His trucks would come in. They were all washed and painted. They weren't ugly old looking things. He took a lot of pride in that.

So the alcohol plant, they added – I think when I was there earlier – another pulp mill, what's called a perma-chem system. It was sort of a semi-chemical pulp mill... semi-chemical, mechanical. They do a lot of it by just grinding the wood up and then a little bit of pulping so you get a high yield, not much waste liquor. The chlorine plant had already been built by the time I got there. I guess the treatment lagoon was the big deal, I guess. That's all I can really think of.

JABALLAS: Okay, so more about when you worked there. What was your best memory working at the plant?

NEAL: Oh gosh, I don't know. It would be hard to... pick one out. Hmm...

JABALLAS: Any one that pops into your mind.

NEAL: I really wouldn't. Maybe some of the... well, no, I guess. I guess I can think of one, and that has to do with technical... When we always had a close alliance with another part of Georgia Pacific called the chemical division, okay? We weren't part of them but we interacted a lot, and they used to... at that time Georgia Pacific they really had a chemical division. They were making commodity chemicals but a large part of that was also making resins, glues if you will, for making particle board and plywood, okay? And oriented strand board. (Points to his walls.) This is oriented strand board right here, the stuff with the chips like that, okay? Sometimes called flake board. And we were always trying to figure out a way to get our lignin into the resins as a way to sell lignin and – I'm trying to think of when this was... this one had to be about '75, I think – and they had hired a fellow to be vice president in charge of the chemical division named Marshal T. Hahn. Prior to that he had been president of the University of Virginia in Blacksburg, Virginia [and] he later went on to become CEO. He and I started the company at the same time but he had a head start. He started out as a senior vice president and I started out as a research chemist.

Well, anyway, at that time the resins that were made, the glues that were used to make particle board were emitting a gas called formaldehyde, which was kind of stinky and people worried about its health effects. And particle board was used extensively in making mobile homes, okay, for a couple reasons: one, it was inexpensive and two, it

doesn't change size with humidity the way plywood does. ... Anyway, there became a lot of concern about the formaldehyde emissions and Georgia Pacific at that time had a big distribution division. So we made particle board and we also purchased formaldehyde and sold it through our distribution divisions. And so we, in one way or another, touched seventy percent of all the particle board made in the United States at that time. And so we had a technical meeting and Marshall Hawn got up and said, "This is a huge problem for the company. I want everybody to spend some time trying to figure out how to solve this problem." Well, the people from the chemical... the resin division who were the experts immediately said, "It can't be solved. It's inherent in the glue. The glue just is forever and ever and ever keeps coming apart and emitting formaldehyde."

So I was at that meeting along with another fellow named Howard Holmquist and we flew back on the plane, and we were sitting there talking on the plane – this meeting happened in Arkansas – and we're on the plane and I said, "Tell me about this." And he was a resin chemist so he filled me in and we both agreed that there were some inconsistencies in the argument about how all this happened. But we got the textbooks out when we got home and it was written in there and all that stuff. So we went to work on it sort of on the side, as a project, and we quickly figured out that there were some major inconsistencies, things... The experiments we did did not fit the theory out there at all, and the next time we had one of these meeting – which was about six months or a year later – we were able to go and present data that showed that the model was wrong and that there was a solution to the problem. We didn't know necessarily what it was but we showed that it was a solvable problem.

[It was] maybe one of the most important things I ever did technically, right? It was, I mean, you don't very often in your life get to show that the textbooks are wrong, right? And of course I went to my boss, Jack Dunkak, and asked him the question knowing what the answer would be. I said, "You know, this is really important work." He said, "I agree." I said, "Can I publish it?" He said, "No!" [Laughs]

JABALLAS: Why wouldn't he let you publish it?

NEAL: Because it's a trade secret, right? We want to get this into the area first because it is a technical advantage to us, right? Well, you don't hear anymore about... There's still as much particle board made as ever was but you don't hear about formaldehyde anymore because they don't make it the same way. They solved that problem. So that was probably one of... maybe the thing I did that gave me the most satisfaction.

JABALLAS: Did you have...?

NEAL: We had a strike one time. There was not a lot of satisfaction in that... in some ways there were, but that was a difficult time.

JABALLAS: Were there any other bad experiences at the plant besides the strike, or was it mostly positive experiences?

NEAL: Mostly positive experiences, yeah.

JABALLAS: What surprised you the most during your work there?

NEAL: Oh gosh, I don't know how to answer that. I guess what's always... Basically I think of myself as being a scientist, and I guess... Every place I've worked, not just Georgia Pacific, but you go into a meeting with good news scientifically and you just assume that people are going to be delighted to hear that. They aren't always. [Laughs] People have their own agendas. They don't want to hear you know. If you have data that shows their opinion is wrong they don't necessarily want to hear it. So that's always been a frustration [for] me, but I think everyone has that frustration. I'm sure a lot of your professors have that frustration.

JABALLAS: Were there any important events at the plant that occurred while you were there?

NEAL: Well, again, I will tell you one more story of... sort of personal success that I guess was kind of important at the time. We had a chlorine plant that used mercury electrodes – as you know, you already know that – and we were under the gun to get mercury emissions down in the water to very, very low levels. ... I think I care about the environment as much or more than most people. But personally, I think the Nooksack River runs over cinnabar deposits and the Nooksack River puts significant amounts of mercury into the Bellingham Bay everyday, and the amount that we were putting in by that that time was trivial compared to that, and I personally thought there was more important environmental things we could be working on than that.

But anyway, that's the one we were working on, and I was not assigned to that. I was an RND, and there was some other people working on that and they had installed a mercury treatment system. They took all the water that fell anywhere in the chlorine plant – basically they built a dike around the chlorine plant – and all the water that came in there, whether from pipes or rain or everything, all that ran into a common holding tank where that water was treated with sodium sulfide to precipitate mercuric sulfide before the water could be discharged. And [there] came a time when that system just stopped working. I mean, they were treating it but they would analyze it for mercury after it came through the treatment system and the mercury would still be there. And so when that happened they took that waste stream... they can't discharge it into the bay, they put it back in the pond. Well, the pond was gradually filling up, right? So it got to be quite critical. And so they came to Grey King who was still there and asked him to assign more horsepower to that work and he asked me to work on that. And there was already a young fellow in another group named Henry Asbell working on it – sharp young fellow – and he had built a filtration system in the lab that duplicated the results out there which means [that] when it was working, he got good results, when it wasn't working, he didn't get good results.

Well, we figured out in a matter of about a week what that problem was and figured out how to solve it. And I can remember when... Grey King was a very smart fellow and by that time he had already figured out that he wanted me to be his successor. So he would

use meetings like this... he looked at those as an opportunity for me to convince other people in the mill – other people on the same level as Grey King – that I would be a good choice. And I could remember, we had that meeting, I gave my presentation, and in the middle of the presentation one of the guys responsible for that area got up and ran out of that room. [Laughing] As soon as we heard the answer... he ran out of the room – we're going to institute that before lunch. That was kind of fun. We did get that problem solved. But it was a fun thing. It shows you what you can do when people really do try to cooperate.

JABALLAS: Team work.

NEAL: Mm hmm.

JABALLAS: Were there any other technologies besides that?

NEAL: Oh, there were lots of them, but those were... Our job was to bring out new products and so we brought out products in micronutrients and dye dispersants and pear flotation. When you were a kid you bobbed for apples but you never bobbed for pears because pears sink. And so, you know, when they pick apples in an apple orchard they take the box and set [it] in a big sink full of water and the apples float out and they don't get bruised. They run down this little river they built and get sorted for color and size and everything. Well, in order to do that with pears you have to add something to the water to increase the density of the water to make the pear float – and I didn't figure that one out, somebody named Nancy Smith did that who was work[ing] there - a little product, but a neat little thing. There were all kind of things that came out.

JABALLAS: I never knew pears didn't float.

NEAL: [Laughs]

JABALLAS: I guess you learn something new everyday. So you said that your experience... at GP was very positive?

NEAL: Oh, yeah. I'd say it was a great job.

JABALLAS: What do you think the city... of Bellingham should know about GP?

NEAL: GP supported, you know... The relationship with GP and the city, I think, was very good right up to the end... right up to the current mayor is what I would say. GP was a huge supporter of the United Way. They really worked hard to try and get their employees to donate to the United Way and then on top of that they matched that out of company funds – scholarships for kids. One of my boys got a four year scholarship to any college he wanted in the United States or anywhere else, you know? And they gave out several of those every year – good jobs for people... huge tax... contributions. Everybody, every charitable organization – that's not the right word – every group that needed money, whether it was the 'Y' or whatever, knew that there was a soft touch



down at the end of the street, right? And it was really disturbing to me because just about the time I came back after finally retiring to see the relationships between the city and Georgia Pacific so strained because they had not been, you know... they had not been before that. It's too bad.

JABALLAS: So you retired in '92? Where did...?

NEAL: I retired at 2000... at the end of 1999. I left Georgia Pacific in 1992.

JABALLAS: Where did you go then to?

NEAL: I went to work for a smaller company in California called Grey Sierra Horticultural Products Company.

JABALLAS: What type of work was that?

NEAL: I was a vice president of research and development. This was a company that... a small company. Georgia Pacific by that time was a fourteen billion dollar company. This was like a one hundred million dollar company. It had been recently formed from two smaller companies and they wanted someone to put together a research lab, and after managing someone else's research lab for a long time it sounded pretty exciting to me. I was fifty-one years old.

JABALLAS: Was it the same type of work?

NEAL: Kind of, but a totally different area. This was in horticultural products. So we're making special fertilizers and things like that, okay? Potting soils and things like that. But they had a lot of good scientists working there. Those guys all had PhDs in agronomy or horticulture or something like that, and they wanted someone to come in and get their quality control program under control and things like that. Went to work for them down for them down in California in the Bay Area and then a year later we were for sale and a year later we were sold and acquired by the Scotts Company, which is a larger horticultural products company headquartered in Ohio. And I figured I'd be fired because they already had a vice president of research and development but, lo and behold, I wasn't. They offered me the job there and so I went to work there, only now I have a bigger group. Now I had a hundred people reporting to me.

JABALLAS: Where was this in? Was this still in California?

NEAL: No, this was in Ohio, Marysville, Ohio, outside of Columbus. And then while I was there we became interested in genetic engineering – the possibility of improving grasses, turf grasses, through genetic engineering, and I really, in the end, started focusing on that. We actually acquired a company that was doing genetic engineering and went to work on those kind of things. Okay. Can we take a break for a minute?

JABALLAS: Oh yeah, sure. I'm actually almost done with this interview.

NEAL: Give me just a minute.

[TAPE ENDS, RESTARTS]

JABALLAS: Any last thoughts about GP that you wanted to share that we haven't already covered?

NEAL: Well, first of all, GP doesn't exist anymore. You know that? Are you aware of that?

JABALLAS: Yes I do.

NEAL: Not just here, but anywhere

JABALLAS: I know it. The plant closed.

NEAL: No, the whole company was acquired by another company called Koch industries so there is no GP anymore. It's hard to imagine that, but anyway... I don't know. You know, GP sent a lot... we used to joke that GP put a lot of kids through college. What we meant was it provided employment for people that could afford to – they could send their kids to college. It was a good company to work for and I'm kind of sad to see them gone. But times change, that's it.

JABALLAS: Yeah. Well, thank you for your time.

NEAL: You're welcome.