Nuts and Bolts: Stories from New Britain Manufacturing
Connecticut Humanities CT at Work Project
CCSU Students: Emily Oparowski and Kasie Marchini
Interview Subject: Phil Pearson
Factory subject worked at: Fafnir
Date of Interview: February 8, 2014
Location: New Britain Industrial Museum

DESCRIPTION: This interview took place on Saturday, February 8, 2014, at 10:30 a.m. at the New Britain Industrial Museum in New Britain, Connecticut. Phil Pearson is a father of three, a grandfather of six, and an employee of Fafnir for almost fifty years. He has a Bachelor's degree in Metallurgy and helped develop and improve the ball bearing during his career at Fafnir. He is a soft-spoken, intelligent, and polite man. For the interview he wore eyeglasses, khaki pants, an orange polo shirt, and off-white Nike sneakers.

Emily: How did you get your job in the factory?

Phil: Well, I graduated from college in 1950 and people contacted the school at that time. It was an interesting thing, right after World War II; there was a slow period in 1949. It was the slowest, I guess they weren't hiring. Well, I graduated in 1950 and I had a few choices: one was Fafnir, a steel company. And the other one was from Stanley Works and I picked Fafnir over Stanley Works because there was a lot more technology. There was a lot more precision work. And it worked out for me in the end. Just to make a note though, if you're going to write anything, a lot of people think a ball is a bearing. Have you run into that? You'd be amazed. This is a ball, but this is a bearing. It has several balls. And it has an outer ring and an inner ring.

Kasie: Where did you go to college?

Phil: MIT.

Emily: So what years did you work at Fafnir?

Phil: I worked at Fafnir…I started in June of 1950. I retired the last day of 1999. A few more months and it would've been 50 years, but that was too much. In that time, the Fafnir bearing company was in New Britain. Then in 1985, Textron who owned it sold it to Ingersoll Rand, so the last fourteen and a half years I commuted up to Torrington. I never really changed; it's the company that changed.

Emily: What sort of work did you do at the factory?

Phil: Well, first of all, my education was in the department of Metallurgy, which of course became material science and a lot of other things in the future. But one of the things about a ball bearing

is the contact area with the ball is very small. This means that it has a high stress. Because it's that highly stressed, you have to heat treat the entire product. The whole bearing, the inner ring and outer ring has to be heat treated. The man I worked for, his name is Henry Hubbell; he had put heat treating on a more scientific or solid basis which means we knew exactly what temperatures things were. Have you ever used a cook book? You know, they're all wrong. How long does it take to cook the Thanksgiving turkey? Let's say hours. If you put it in for the time it said in the cook book at that temperature, it would be all burned up. All of that is the time that it takes for the material to get up to the heat you're talking about. Most bearings were 1500 to 1600 °F. Some of the higher temperature ones were around 2000. There were advances in the equipment. The company was very good at buying the latest and best equipment. The heat treating took place in protective atmospheres so they didn't get rusty or flake off on us.

Emily: Do you think that your education helped you working in the factory? Did you use it every day?

Phil: Oh yeah. We got very much involved in the jet engine bearing business. It's very high technology. The bearing – Fafnir made millions and millions off farm equipment bearings – farmers had money because these things wore down and they had to buy new ones every year. The aircraft people had incentive to get more life out of their bearings. Back when I started in 1950, the aircraft business was in propellers. So we got introduced to the jet engine business by Pratt & Whitney about the time they started to make the jet engine.

Kasie: So Fafnir worked with Pratt & Whitney?

Phil: Yes, they were the supplier.

Kasie: So you supplied to Pratt & Whitney?

Phil: Yes. We first went into production for General Electric. It moved faster. Bearing technology factories are basically a ring factory. All kinds of things can be heated up. They develop all kinds of internal stresses. There's a lot of technology in that.

Emily: What were working conditions like in the factory?

Phil: There were certain rooms where they made instrument bearings which were closed off and had air conditions. All the things you could think of to keep things clean. But that was a very small part of it. This was a big factory. They had sections to be heat treated, and then they went on to be finished…there were grinding and finishing operations.

Emily: Did you take pride in your work?

Phil: Very much. I was always learning something. As far as the jet engine business, which doesn't make the most interesting story but we learned how to use new materials at higher

temperatures and higher speeds. Of course they had the incentives of wanting the bearings to run longer.

Emily: So the ball bearings were also used in the first moon landing. Did you feel like while you were there you were making history? Without the ball bearing it wouldn't have been possible.

Phil: Yes. The company was very much a family. There were probably nine or ten of us engineers that came from out of town or out of college. We used to have lunch together. We would babysit each other's kids and go to their weddings, unfortunately their funerals now. Most of these people were married. I wasn't. One of the superintendents of maintenance in the factory…he was probably ten to fifteen years older. He was also president of the Parent Teacher's Association where he lived in New Britain. The parents were putting on their own fundraising show and they needed somebody to play the piano so he asked me to pitch in with their orchestra. Long story short, the music teacher is in the show and we got married. At Fafnir everybody seemed to know each other.

Emily: So your friend with the orchestra, this was your friend from Fafnir?

Phil: Well, some of them. This gal was the music teacher and we just hit it off.

Emily: Yeah, that was one of my questions, like how much you socialized with your co-workers and whether or not Fafnir encouraged you guys to socialize…

Phil: It was too big to really mix everybody. They used to have the Foreman's Outing which included all the salary people. Somehow you just got to know people. Unfortunately, my wife died just about right after I retired so I play piano for a couple of bands.

Kasie: Do you have any children?

Phil: Yes, I have three children, two girls and a boy. They strangely live around here. One's in Berlin, one's in Coventry. I have a daughter in New Britain. They each have two children of their own, so I have six grandchildren. I have a grandson that's in Economics at UConn and teaches a division of the University of Texas. He married a gal that came from Lebanon. So they're having their first child next month. Of course we had social activities, the Episcopal Church, the repertory theatre. In terms of circles of friends, there were always engineers who got together. There were all kinds of things going on in New Britain. It is about the right size. I don't think if I was working in Hartford, we wouldn't be playing on the Hartford stage or anything like that. So New Britain had its advantages. Getting back to the company, the factory workers had been unionized in the late 40's. So every three years there was a strike. Other than that we seemed to get along fine.

Kasie: Were you ever involved in a strike?

Phil: Well, yes. We were never on strike, but engineers were considered management. They collected money for United Way or something like that. So we had police picket lines. Metallurgy has a lot to do with magnifying things under a microscope and taking pictures of it, so the company's photographer set up motion picture cameras but nothing serious ever came of it. That was our involvement in the strike.

Emily: Were OSHA laws enforced strictly? Or was it more about making the product and working quickly?

Phil: They were always pretty careful. I remember guards on the machines even back before OSHA. I'm sure OSHA added to this. They probably became stricter and had different ideas of how things should be done.

Emily: So they cared more about safety than productivity? Those are good values for a company.

Phil: Safety was a big thing, but they go together.

Emily: That is true. Were there a lot of injuries with the machines?

Phil: With the stamp machines people had lost fingers. But the machines were set up so you had to push two buttons before it worked so you couldn't have your hands under there, but nevertheless it happened. I came much closer with OSHA because I had the only laboratory. I was involved in the early parts of the Environmental Movement in the late 70's. In the 80's they hired their own people to do inspections. We had to worry about the discharge into the air or the water. You would just put it down the nearest hole. And I also discovered that the City of New Britain had very good records of all the sewer lines for the factories around 1902. But there was a lot of improvement and they put various devices to stop putting oil around the vent to lubricate the machines.

Emily: So what kind of changes did they make with the Environmental Movement? Did they have to update certain things so they were up to code?

Phil: Codes seem to come naturally. Mostly you had to stop putting oil down the hole. There were various ways to do this. Another problem was the acidity. The cleaning procedures were set to wash the machines and they were on the other end of the PH Scale.

Emily: How did you get paid, by the hour?

Phil: Initially it was by the week. There was a lot of piece work with the factory workers.

Emily: So you were kind of separate from them? Because you were the Engineer, right?

Phil: Yes.

Emily: You had your own laboratory, you said. So what was that like?

Phil: Well, there was some chemical analysis. We had heat treating furnaces. We had a rule that before you wrote a specification for what the factory should do, you had to work it out yourself and prove it worked. That's one of the most scientific things that we did.

Emily: At some factories, the workers would get paid in cash, rather than checks. Is that how it was at Fafnir?

Phil: Yeah. When I came they had pay envelopes.

Kasie: When did they switch over?

Phil: I don't remember. I think it was fairly soon.

Emily: My grandma used to work at Fafnir as well, and she mentioned to me that there were certain machines that women could work, and then there were certain machines men could work. She said that she worked on a man's machine, but she was getting a women's pay.

Phil: Well, they had an excuse. And this was not my doing, but men were more capable of lifting the boxes. It had to be justified. The factory people – basically there were three shifts, seven to three, three to eleven, eleven to seven – but some of the crowd got out at three o'clock and they always let the women out about six minutes earlier than the men.

Emily: Oh okay. So I guess it had its advantages too. But they got paid less, right? But they also did less work…? Or easier work?

Phil: Management people I knew used to talk about nickels. In other words, they probably got five cents an hour or less. Now what they were getting an hour, I have no idea. Whether that was five cents less out of a dollar…it was not a big difference. They didn't get paid twice as much or half as much or anything.

Emily: So what was your pay like, if you don't mind me asking?

Phil: I started at $60 a week. Of course everything went up. I started out as a Metallurgist in 1959, and then I was called Chief Metallurgist. That was a title everybody understood. Then they shuffled around and I was called a Metallurgy Engineer. Toward the end of the line I retired as an Ingersoll Rand fellow, that name "fellow," that was the top of the line for anyone who was

not in usual management. You know, the pay scale had a great deal to do with the number of people who worked for you.

Emily: So what were you making when you retired, because you started at $60 a week? Did it change dramatically over those fifty years? I hope it went up!

Phil: It was about $100,000. But scientifically, the bearings solved most of the steel problems and manufacturing problems. But the technology is focused mostly on the lubrication and the relationship of the lubrication to the bearing. And that's called tribology – no one knows what that means. It tried to improve the life and reliability. It's very interesting, the stresses are so high on the contact area that your lubricant would actually act like a solid when it's under stress. When I retired that was an area of advanced technology. By the way, why the aircraft engine people are so interested in quality is not the safety or reliability, it's for keeping the things running. These jumbo jets would be making round trips to Florida every day. There are hundreds of people on there and they're paying a hundred dollars each so the whole thing was to reduce the overhaul period. They had to improve the whole engine overall before they got permission to fly across the ocean.

Emily: It sounds like Fafnir cared more about quality and safety rather than making money. And in turn they made money, but those are good values for a company to have.

Phil: I would say, for Fafnir, in my position they supported anything you wanted. If something can be done better, do it. In the early days we started with propellers and then rapidly got to jet engines. They hired a monthly consulting agent from MIT and we contacted him directly to solve a problem or to get new ideas. When things were really complicated he got all the other bearing companies in the U.S. and formed a committee to support fundamental research. He always included me. They hired the best people they could get. I have one example that has to do with the jet engine bearing. The engines got bigger and it changed the scope of the work. If you're at the beach and you swing it fast enough, the water doesn't fall out of the pail. That's because the rotation thrusts the water so it's pushing a hoop tension. This was not into any of the calculations at that time because all of the bearings had compressive stresses, they developed shears sometimes. But tensile stresses were not in it so here's a new thing. Fafnir in the 60's had purchased a small bearing company in England. We got into fracture mechanics, which has to do with how big the crack has to be before they break. But we were the first ones trying to apply fracture mechanics. But you're building in a compressive stress through the heat treatment to counteract the tensile stress from spinning around fast. That really only applies to a big bearing. This was a new problem so we were seeking money and support for what had to be done with heat treating and different materials. So we talked first to Pratt and they sent us down to Westpound beach where they had military engines. Then a few months later we went to GE who was our second supplier they were quite interested so we had a joint research project and developed a bearing to withstand the speed. We were having a discussion one night when Professor Riverback came down and we were discussing this plane, and the engine in the tail

was actually cracking. They had a couple of episodes where the flight took off north and had to land at Kennedy. When the bearing fails the whole engine shifts and the blades come out.

Emily: I did some research and I found out that the bearings are used now to make earthquake proof buildings. They make a base and it's curved a little bit and they have columns and they put the ball bearing. So when an earthquake happens, it actually separates the building from the ground. So it goes from like farm technology, to you're on the moon. It's something so simple, but it can be used for multiple things.

Phil: Yes, well it's the same concept. It moves to relieve the stress. That's why they say the people who build skyscrapers want them to bend a little to relieve the stress so they don't blow over.

Kasie: Is there anything else about your experience at Fafnir that is memorable to you?

Phil: Well, when I went up to Torrington, I was exceptionally well-treated and there were nice people, and I was well-paid. But it was an entirely different company. Torrington had different divisions and they didn't talk to each other the way they did at Fafnir, you had to get permission from higher up. When steel hardens that's where the compressive stress comes from.

Emily: So you mentioned at Fafnir that everyone knew each other. That changed at the Torrington Company because they had levels.

Phil: Torrington was a needle bearing company. Fafnir was mostly a ball bearing company. They made sewing machine needles and that was their origin. I was in a technology division. We talked to each other but they wrote everything and sent it to the head of the department and sent it on to me. At Fafnir, we would be criticized if we wrote a report and didn't send it to everybody that was interested. At Torrington, everything was kept close to the vest. My friends up there said it wasn't always like that; it used to be more like Fafnir. But that was the biggest difference up there. Their biggest customer was the General Motors transmission. The transmission has 17 needle bearings and one ball bearing, and the ball bearing costs more than the needle bearings put together. There were plenty of people you could learn from at Fafnir. It was totally a different culture.

Kasie: Can you think of anything else?

Emily: No, I can't think of anything else right now but we'll email or call you if we do. Thank you for taking the time to meet with us.