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Company Affiliations: C. D. Howe Company, Agra Engineering

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Summary: Former structural engineer for C. D. Howe Company Bill Reist discusses his interactions with the grain industry through his engineering work. He describes joining the C. D. Howe Company in Port Arthur, and he explains the specialized nature of work with grain elevators, including issues that can happen when corners are cut. He discusses his major elevator projects with the company, including design work for an elevator in Vancouver and in Indiana and dust control equipment retrofitting, and he explains the differences between Canadian and American elevators. He recalls major incidents on the waterfront, like the collapse of UGG A's annex and the explosions at Pool 4A and B, and he describes growing issues with older elevators, like timber pilings rotting. Reist discusses more about the C. D. Howe Company, like their work in annex expansions, their major competition in Thunder Bay, Howe's signature elevator design, the company's international projects, its sale to Agra, and his colleagues and managers. He describes other features of grain elevators, like their dust control improvements, their alterations to the Lake Superior shoreline, and their annex bin construction materials. Other topics discussed include archival photos of Stewart Elevator and Canada Malt construction, downturn in grain movement through Thunder Bay, automation of elevator equipment, specialization of elevator engineering in Canada, and wildlife in elevators.

Keywords: C. D. Howe Company; Agra Engineering; Structural engineering; Terminal grain elevators—Thunder Bay; Terminal grain elevators—British Columbia; Grain elevators—United States of America; Grain elevators—design and construction; Grain elevators—equipment and supplies; Wood pilings; UGG A collapse; Grain elevator disasters; Pool 4 A&B explosions; Grain elevator explosions; Grain dust; Dust control; Great Lakes water levels; Storage annexes; Concrete slip forming; Tile construction; Automation; SWP Pool 7; MPE Pool 2; Richardson Elevator; SWP Pool 4A & B; MPE Pool 1; UGG Elevator M; UGG Elevator A; MPE Pool 6; Indiana; Argentina

Time, Speaker, Narrative

NP: It's March 13th, 2012, and the interview is taking place today at Apartment 1212, 199 Academy Road in the apartment of Nancy Perozzo—me, the interviewer. I'll have our narrator today introduce himself and his connection to the grain trade.

BR: My name is Bill Reist, a structural engineer. I worked with C.D. Howe Company from 1964 until 1991 related to doing a lot of grain elevator design and construction.

NP: So, just very briefly, tell me about how you got into engineering and ended up at C.D. Howe who is—is it fair to say—was world-renowned for his abilities in elevator construction?

BR: I didn't know anything about him when I got hired by the company.

NP: Okay.

BR: Other than his political side. But, well, I studied engineering at McMaster University. I think I got interested in engineering when I worked on a pipeline early on in, what was that, 1958? Construction and so on kind of inspired me a little bit, so I went and I took civil engineering at McMaster. Then when I graduated, I worked briefly in Hamilton and so on but was interviewed in September of 1964 in downtown Toronto and was told to report next week up to Port Arthur, and I had a job!

NP: Had you been to Port Arthur?

BR: Furthest north I had been at that time was to Temagami working on the pipeline. [Laughs]

NP: Ah, okay. So, where was the office at that time?

BR: It was down on Cumberland Street—95 North Cumberland—which all the time that I worked for them they were there. Previous to that, they had been in the Whalen Building.

NP: Was it a large operation, the engineering firm, at that time?

BR: At that time, they were just starting to build their staff back up again. They had been down quite low for a while there, but during the time that I worked there, there was about 30 people working in the office. Yeah. Then they opened the office in Toronto and the office in Ottawa, and the office in Vancouver was already operating at that time.

NP: What was your first exposure, then, to grain elevators?

BR: Pretty well walking in the door. [Laughs] Let's see now. I guess the first major elevator that I worked on the design for was the Saskatchewan Wheat Pool elevator in Vancouver. Prior to that, I worked on other projects in the office, but that was the first major grain elevator job. Then following that, one was a design and construction of an elevator in Indiana.

NP: I don't know if your memory goes back far enough to any great degree, do you recall the first time you went in a grain elevator and what you thought about or felt, smelled, heard?

BR: I can't remember the first time as such, but certainly there are some familiar characteristic things about them. Certainly, the dust, in the wintertime how cold they are. I guess learning your way around to find where you are, that sort of a thing, it takes a little bit of time, but not so difficult as a paper mill, which is--. [Laughs] I consistently get lost in paper mills, so.

NP: From the perspective of your training as a structural engineer, how do grain elevators fit on the continuum of buildings?

BR: Well, they're quite a specialized structures, particularly because of the fact of their big silos that are containing the grain. So, the dynamics of grain flowing into and out of the silos, and all the handling through the chutes and cleaners and everything in the processing of grain through them. They're quite a specialized structure, and they're a big machine.

NP: Are there challenges that--?

BR: Yeah, there are challenges. There certainly are challenges that--. I think part of it is being somewhat conservative in design. Often cost tries to override that, and there are some consequences to those sorts of things.

[0:05:10]

NP: So, if it's not done properly, what kinds of things can and have gone wrong?

BR: Well, for instance, one I can think of is the Prince Rupert elevator. Those are big silos, big diameter silos. They skimped out on the reinforcing steel, so what you get then is a lot of vertical cracking in the walls because they try to expand. Then, in particular in a climate like Prince Rupert where it rains 400 days a year, moisture penetrates and gets at the reinforcing steel. The reinforcing steel starts to corrode, which means it expands, and that spalls the concrete off. Basically, they can self-destruct pretty easily. So, if

you put enough steel in to resist those hoop-stresses that are trying to make the walls get bigger and to crack them, then you're going to have a more robust and more durable elevator.

NP: The Prince Rupert elevator is not that old.

BR: No, it's not.

NP: As far as elevators go.

BR: But it's cost that does it. It's an easy way to reduce the cost of it. "Let's see how little rebar we need to use." Often the lesson is that you should have done it right the first time.

NP: And how do you remediate that?

BR: They basically went inside and built a new silo inside of them.

NP: Oh my!

BR: A lot of money. Yeah.

NP: A lot of money.

BR: Yeah.

NP: So, is that something that the firm here was involved in?

BR: The Vancouver office of C.D. Howe was involved in that.

NP: Ah. Where were the offices located?

BR: Offices in Vancouver, here in Port Arthur, and there was briefly an office in Toronto for about four or five years, an office in Ottawa and one in Montreal.

NP: Did they communicate much?

BR: Oh, yeah.

NP: Like were people moving back and forth between them?

BR: Yeah. Yes. When there was work in one and not in another, that sort of thing, people moved back and forth and worked in various locations, yeah.

NP: So, when you were working on the Saskatchewan Wheat Pool elevator that you mentioned in Vancouver, were you working in Vancouver at the time?

BR: No, the design for that was done here in Port Arthur, and then I was out there a couple of times during the construction of it. I have worked in the Vancouver office on various projects from time to time.

NP: Do you recall what year it was that that Saskatchewan Wheat Pool elevator was being designed and built?

BR: ’66.

NP: Oh, so you got your feet wet early!

BR: Oh, yeah.

NP: Just a couple of years in, yeah. I’m going to continue on with elevators at this point, but if I forget, remind me I wanted to talk a bit more about C.D. Howe and where else they were building elevators, not just in Canada. You mentioned Indiana. But let’s continue on with elevators. You mentioned the problem with the one in Prince Rupert, which makes me think of the ones here, and they have been around forever.

BR: But they’ve been repaired as well.

NP: Oh, have they?

BR: There's been lots of repair work done on them. You can probably go across the waterfront and find the same sort of evidence of things happening. Where the moisture gets into the walls, that's what they're most vulnerable to. A lot of them have been painted and so on in order to address the problem of moisture. There's been lots of repairs done to them where the--. **[*…audio skips*]** Strips around the silos and so on, that's the evidence of what's happening there.

NP: Can you think of some that, if I were to go down, I can take a look?

BR: I'd have to go back and have another look. [Laughs]

NP: Because one of the things we're hoping to do as part of our display this summer at the Marina is design a walking tour and a kayaking tour.

BR: Oh, okay. Yeah.

NP: So, if we can get a little closer that we can see these strips, it would be an interesting item to point out.

BR: Yeah, offhand I couldn't think of any, but.

NP: We'll take a little tour down.

BR: Yeah. It would be. Probably the thing to do is look at the ones that aren't painted because they're the ones that, if they're still the old concrete--. Now, you'll certainly probably see it at the old Pool 2 silos. But it's amazing what kind of shape they're in for just sitting there.

NP: Yeah, right. That and there's a set of silos on Mission Island, I guess, that have been there since I think the 1920s.

BR: There's an old workhouse there. I don't think there's--.

NP: No workhouse, I think it burnt fairly early on.

BR: Yeah.

NP: So, let's--. **[*…audio skips*]** How do you get started? First of all, do you know what went into the bidding process and who competitors would have been?

BR: No.

NP: No.

BR: Syd Halter did all of that. All the administrative and business development and everything else was very much Syd. Well, it was Syd Halter and Carl Byers were basically joint managers of the office here.

[0:10:11]

NP: And Syd is still alive. Is Mr. Byers alive?

BR: No, he's not, no. So, they kept all of that stuff very close to their chest.

NP: Competitive--?

BR: They didn't trust anybody, I don't think. [Laughing] They kept it, yeah, very--. It was a different style of management than it is now. Different.

NP: So, who was the lead on the project, do you recall?

BR: Oh, Syd would have been.

NP: Syd would have been?

BR: Yeah, yeah.

NP: And what was your involvement?

BR: I did structural design for it, partly for the workhouse, the earthquake design--. **[*…audio skips*]** Challenge there because it was built on the side of a mountain pretty much in north Vancouver and built on what had been sawmill waste and sawdust and so on

and so forth. So, the getting of an adequate foundation underneath there was very challenging. Subsequently over the years, there was a lot of settlement and movement of the buildings.

NP: So, what were the piles in those days?

BR: They were timber piles.

NP: Timber? So, still timber piles?

BR: Timber piling underneath all of the storage annexes and there were pre-cast concrete piles under the workhouse.

NP: Well then, you're the person for me to ask because I was just looking at a book done in 1913 where they were talking about the pilings under the Grand Trunk Pacific, and they said 12,000 piles. That's not a misprint?

BR: No. No, no. That doesn't surprise me at all. When you look at any of the elevators here along the waterfront, all of them are on timber pile--. **[*…audio skips*]** Richardson, which some of that is cribbing, but most of them are all on piles.

NP: How is it possible to use cribbing on the Richardson's? What's different there?

BR: Because the bedrock is very close there, so the draft for the ships is limited along their dock. As the lake levels decline, it's become a bigger and bigger problem at Richardson.

NP: So, they just compensate? There's not much they can do structurally to change that?

BR: No.

NP: So, it's just compensate by less load on the ships?

BR: That's right. They can only load the ships to a certain level. They can't load them to full draft, yeah.

NP: Now if you think about our hope for this project—which is 100 years from now somebody will be listening to your conversation and wondering just how things were [laughing] built back in the old days—so take us through the design of an

elevator. Who do you consult with? You mentioned--. **[*…audio skips*]** Does the company that will be supplying the grain, do the railways? Do any of those feed into your planning?

BR: Usually, it would be between the engineers and the company and the client's management—people and operators and so on that are--. One I can think of that I was involved with really from day one was the one in Indiana. We sat down and spent a week with some of their principals and discussed the whole thing of what they wanted to do with the elevator, how big it had to be, how they were going to manage it, how they would bring grain in and out, and all the things that they wanted to do in the elevator. So, that was discussed. There was various layouts because they had a piece of property that they were going to build on. So, you went through and came up with a design concept of what they wanted to do, and then the next step would be to bring in soils consultants and--. **[*…audio skips*]** And then the structural work could begin. At the same time, all the mechanical work—the handling systems and so on—would be designed so that they could be fitted into the structure. So, that would be the way that you proceeded through it. Then preparation of engineering drawings. With those drawings and specifications, you go out to tender to contractors to build the thing and proceed on through.

NP: Do you recall any of the prices? Like how much this contract meant to C.D. Howe as far as what the bid what? How much it cost to build the thing?

BR: As far as the engineering is concerned? It's all secret.

NP: It's all--. Still?

BR: I don't know. I have no--.

NP: But then it was all secret? [Laughs]

BR: It was all secret at that time. Yeah. I know that the bid to construct the elevator—that was 1968—the bid was $4.5 million. The contract--. **[*…audio skips*]** He offered to take half a million dollars off the price if the engineers weren't associated with it during construction. [Laughing] They didn't accept that.

[0:15:31]

NP: Why do you think that that was a stipulation?

BR: Because they'd save money if they didn't have the engineers running around telling them how to do things.

NP: Would it have made a difference in how they did things?

BR: Probably. I mean that would be my suspicion, yeah. They were quite—the Indiana Farm Bureau—were quite open about that, that they'd done this. They said, "But no, we're going to keep you on."

NP: Where was it in Indiana?

BR: Redkey, Indiana.

NP: Red--?

BR: Redkey, just K-E-Y.

NP: K-E-Y.

BR: Which is just east, about 20 miles east, of Muncie.

NP: Indiana doesn't strike me as being a river city, so--.

BR: No, it was all rail and truck. So, everything would come in by truck and--. **[*…audio skips*]** Went to Baltimore.

NP: From your experience—this was '68, so you had been working on the Vancouver—how would you describe the difference between the two projects? And when you're thinking about that, were there any changes, first of all, in the structure, but also in how things were handled, the handling equipment?

BR: Basically, the difference between Canadian elevators and the American elevators, a big part of it was the explosion prevention or the things that were done to address the potential for grain explosions. So, the Canadian elevators, I think, were significantly ahead as far as the technology that they used to protect an elevator from catastrophic explosions—partly in the use of appropriate electrical systems, and partly--. **[*…audio skips*]** Blow out and so on if there was an explosion, which meant that the force of the explosion was dissipated rather than travelling through the whole elevator. So, those were the different--. So, we kind of took that technology into doing the job in Indiana, which made the elevator a little different—a lot more windows and things—than what you

normally saw in an American elevator. The two projects between Vancouver and Indiana were quite different as far as foundations were concerned because it was all on piles and it was an earthquake zone in Vancouver, whereas in Indiana, earthquakes really weren't a--. There was a minor consideration, but the foundations were all clay, so it was a totally different sort of--.

NP: So, what kind of foundation went in there?

BR: Basically, it was a spread footing foundation. It was all just--.

NP: Poured concrete?

BR: Yeah, mmhmm. Yeah. As far as the configuration of the elevator on its own, it was not significantly different other than that the Indiana project had some very big--. **[*…audio skips*]** Because they were handling two commodities: beans and corn. Soybeans and corn were the commodities that they handled, and they wanted to handle them in much larger quantities as far as storage was concerned.

NP: So, what changes there, then, when you have that--?

BR: It's a little different design because you're working with larger forces because you've got bigger diameter storage bins.

NP: So, the design, is it more just wider walls or is there some configuration--?

BR: Thicker walls. Thicker walls and steel.

NP: Any configuration differences?

BR: No, not really. No.

NP: You had said something about the Vancouver one that had raised a question in my mind. Nope, it's gone!

BR: Building on sawdust? [Laughing]

NP: Building on sawdust! So, it didn't fall in?

BR: No, no. No.

NP: But there have been elevators in Thunder Bay that have sort of slipped their way in.

BR: Yep.

NP: What's going on there? What's up with that? Or what's down with that? [Laughing]

BR: Well, the one that I know anything about is Grain Growers. **[…*audio skips*]** This is Viterra. Anyway, there was a collapse of the outshore annex—which had just been built—and it was basically a failure of the I guess partly the sheet piling and--. What happened was the silos were built beside the dock. So, there was a dock and there was sheet pile wall that goes down into the water to allow the ships to come in. Then behind it, there is the rail traffic, and the rail lines were in the--. So, all the fill that went in behind this storage annex, and that pressure from that, pushed it in. Yeah.

[0:20:24]

NP: Was C.D. Howe involved in fixing up the situation?

BR: Yes, they were, yeah. Because they basically had to demolish the silos that had fallen in and rebuild them.

NP: When did that happen, do you recall, approximately?

BR: About '60--. **[…*audio skips*]** Apparently, the story was they had five different soils experts come up and they had five different answers as to why it happened. But what that did, it basically initiated a program across the waterfront where they went in and put anchor piling structures behind the storage annexes and tie-rods that went out to the sheet pile that would sit at the front at the dock in order to stabilize and keep that from happening in other locations.

NP: You mentioned the term revetment, which we've just scanned in a series of photographs of revetment work at Grand Trunk, I think. What does revetment mean?

BR: Well, it's a wall built of sheet piles. In the old, well, a lot of the original ones, well, they all were timber sheet piling. By the '70s, those timber pilings had deteriorated and--. **[…*audio skips*]** Walls driven in front of the old timber ones.

NP: Now the old timber piles that are there under the elevators, will they eventually rot out? Or are they sort of preserved in the water?

BR: They're preserved underwater, but when you get low water levels, parts of the tops of them are exposed to the air and will deteriorate. That's happened in a number of locations, yeah.

NP: So, given the situation with the lake level going down, are things being done to preserve that which is now open to the air?

BR: What's been done in a number of locations is they've taken and drilled holes in the floor of the workhouse, for instance, and pumped concrete in underneath there to fill that void so that you've got a permanent fill in there that protects it. It keeps the air from getting to the piling, yeah.

NP: So, we should be a little careful kayaking around the--? **[*…audio skips*]**

BR: There's a significant problem. It's a difficult one to address, but ideally you want to keep the water levels up where they're supposed to be. I mean, all of these have been designed to the low water datum of the lakes, so your foundation concrete will be more or less at that low water datum with the idea that your water level isn't going to go below that. But it does. It has.

NP: We are pretty close to that level now?

BR: We are below it now.

NP: We are below it now?

BR: Oh, yeah. We are now, yeah. Yeah. So, that could continue to be a problem depending on what has been done at the various elevators in the past. Yeah.

NP: Now, when you think of the elevator in Vancouver—which is a port elevator handling grain—and the one that you worked on in Indiana, what about the handling equipment and the configuration of the elevator? **[*…audio skips*]**

BR: Using different, working with different commodities. Instead of wheat and barley and durum, you're working with soybeans and corn. So, the kind of cleaners that you use, you've got driers for the corn, things like that. Those features were different from what you would see in Vancouver.

NP: But they all had to do--.

BR: They do the same thing.

NP: They do the same things.

BR: Basically, the same sort of thing, yeah.

NP: Any other things that you recall about the Indiana design and building that are sort of highlights of the project?

BR: Well, it was interesting working in clay like that. The excavations, the sides of the excavation would stand virtually straight up and down, which I didn't believe until--. When the soils people told me that, I just didn't believe it, but it's true. Almost vertically, the walls would stand almost up vertical, I think. We also found that the site was probably the lowest part in the county, and we had a big thunderstorm, and it flooded that whole excavation. We probably had one of the few lakes that you could ever find in Indiana, temporarily. So, they took about four or five days to pump all that water back out again and resume construction. Again, that clay was so stable that it stood and didn't collapse in or anything. That was an interesting thing.

[0:25:23]

NP: So, was there a change made then in the soil levels to prevent similar flooding if another rain came?

BR: No, no. Once you had built the elevator, it wasn't going to be a problem.

NP: So, did you celebrate the days that it opened? Or were you around for the--?

BR: I wasn't around for the opening, no. I was there for probably about two thirds of the construction. The foundations, the initial slip form of the small silos, and I was in the workhouse.

NP: Oh, you had said that the size of those silos was 90-feet across.

BR: 90, yeah.

NP: Which is comparable to what for a usual grain elevator?

BR: Well, the only ones that you would--. The old Paterson elevator had those big, what they call balloon storage. Those silos were of a similar size, but not as tall as the ones we did in Indiana. Other than that, your normal silos are something in the order of 22- to 28-foot diameter, and in rows of 3 or 4 wide and 12-15 long, that sort of a thing.

NP: And height normally?

BR: Heights would be similar, would be about 90 to 100 feet. Yeah.

NP: Okay. You talked about explosions.

BR: Yeah.

NP: I assume that one of the reasons Canada was ahead of the States in the technology related to it is because of the explosions on the waterfront here. Do you recall any of your research or just the stories around the office about the ’45, the ’52 explosions?

BR: Not very much. I’ve seen photographs. There was photographs of what had happened at Pool 4. Basically, to tell the story of what happens with an explosion, your initial--. The idea being that grain dust explosions, the temperatures that forces them is 10 times what it is for coal dust. So, they’re--.

NP: I don’t understand that. What does that mean?

BR: Immensely powerful and very hot. And very quick. So, one of the preventative things to do is make sure that you don’t allow dust to accumulate on walls and everything else. So, housekeeping in an elevator is very important. Because what happens if you have a small explosion, it kicks dust into the air and that triggers another explosion and another one. If you don’t have things that will release some of that pressure to the outside, and you don’t have explosion doors that will close off from one area to another, that will go through like a string of firecrackers. It will just work its way right through the elevator. So, you got one explosion that puts dust in the air, another, and another, and another, and it will travel throughout the whole elevator.

NP: So, in your mind’s eye if you can think of some of those photographs—and I’ve got them sort of in my head—as a structural engineer then, when you look at those photographs, what do you see? What are the indicators of--?

BR: Well, you can see where—if I remember right—one of the leg wells blew out, because that's often where you'll get an explosion because you'll have a spark and it's very dusty inside the legs, the bucket elevator shafts. Okay. So, you get an explosion there that will then trigger another explosion up at the head of the bucket elevator. That will work its way through. It will come down the workhouse and it'll go out the annex. So, you can see the gallery on the top of the bins blown out. But you can almost say, "Okay, it started somewhere here, and you can see how it travelled." It's not like one big explosion that happens. It's a series of explosions that works its way through. The other thing I can remember is that when you went in the elevators after that—like in my time—you see people with burn scars on their faces and so on. That blast wave is hot, and it goes very quickly. So, if you've got clothing, clothing will protect you from any burns, but your exposed skin is what gets the burns. So, you get people with burned ears and things like that working in the elevators. They were survivors of the explosion.

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[0:30:06]

NP: Mmhmm. We have some very moving stories about people that were survivors of that situation. Were there any explosions during your time, or had that been sort of under control?

BR: No. There weren't any that I was related to at all. There was always, from time to time, explosions. Certainly, down in the States there have been a number of them. None that I was involved with, no.

NP: You mentioned housekeeping. Was it an issue in your time, or again, had they--?

BR: Oh, absolutely. Oh, yeah. Yeah. As far as being able to clean the floors well and so on and all the dust control systems--. A lot of the systems that are used to collect dust where it's generated were developed over the time that I was working with C.D. Howe.

NP: That was something that your company worked on?

BR: Yes, yeah.

NP: It was during this time, I guess, that a lot of the dust abatement retrofits were done?

BR: Yeah, as you got into the late '70s and the '80s, they switched from using cyclones to using baghouses to collect the dust and not just spew it out into the air.

NP: So, what's the difference between a cyclone and a bag dust did you--?

BR: Baghouse.

NP: Baghouse.

BR: Okay, well the cyclone you're basically using centrifugal force to separate the dust from the air. The heavy stuff comes out. A lot of the fines are blown out into the air. Whereas with a baghouse, you've got a series of cloth bags that the air passes through. So, they're like a vacuum or a filter on your furnace kind of a thing that will collect a lot finer dust. So, a lot more of the dust is collected.

NP: So, that's why we don't see as much dust around the waterfront anymore?

BR: Yeah.

NP: Did you work on any of those retrofits?

BR: From the structural point of view, yeah, but as far as supporting them and finding a place to put them and all that. But not the mechanical design part of it.

NP: What kind of considerations, when you had to retrofit an old building, what kinds of things created difficulties for you?

BR: Well, basically, you have to make sure that you're putting them someplace on a structure that will support them and adequately provide those supports. You look at wind forces on them. You look at snow accumulation around them. You look at being able to get at them and maintain them and all those sorts of things. Yeah.

NP: As you think of the elevators on the waterfront, have you been in most of them at one point or another in your career?

BR: Most of them, yeah.

NP: Yeah. Could you describe them as having different personalities at various elevators? Or idiosyncrasies?

BR: No, I don't think--. They're basically pretty similar. No, it's more about people than anything else. If there's going to be a difference in them, it's going to be how they're operated that sort of a thing, as far as people and so on. But as far as the elevators physically are concerned and so on, they're all pretty similarly designed.

NP: What about the Searle Elevator, which supposedly had a little bit more pizazz in its design? It was—we hear from Mr. Searle—designed after a building that he had seen in Milan, Italy.

BR: Oh, okay, that's the one over on the island? Yeah, it's probably got a little more architectural features to it than the bulk of them have. Yeah. I'm just trying to remember.

NP: It was much before your time!

BR: It certainly was!

NP: 1929. [Laughing] What changes did you see, other than the dust control, over the time of your career in the structure design?

BR: I think as we went on with it, the business of building elevators and designing elevators moved away from terminals—such as in Vancouver or Prince Rupert and Port Arthur, and Montreal, Halifax, that sort of thing—to the country elevators, consolidating of the country system in the Prairie provinces. So, we got into the smaller elevators that were replacing the old wooden ones across the Prairies.

[0:35:17]

NP: Were you involved in any of the design of those?

BR: No, not really. In Canada, basically, the bulk of them were design built. So, you would have a contractor come in and he would design and build them. We'd been involved at one time with trying to make it work up to what they had told them what it was going to do and didn't.

NP: So, the throughput wasn't what--?

BR: That's right. I mean, they got a better price because it was cheaper to build these elevators, but some of the features were--. What they said the volume, for instance, of storage was concerned really didn't measure up to it because of the way they led the

spouts into it. So, you couldn't fill a bin to the same degree as--. They said, "Oh, the volume is such," but if you can't use the volume at the top of it, it really isn't. Things like how fast they could transfer grain around, the size of spouts, things like that, were also issues that developed when they actually went into operate these plants, but it had sounded really good when they were going to build it. It was financial things that--. **[*…audio skips*]** Which is not an unusual thing across the board. "These engineers are nothing but a nuisance often. They just make things more expensive." But sometimes they work better, too.

NP: Thinking of the elevators along the waterfront here, which ones—if you can recall—which ones were expanded during your time? One of the things that we're trying to do with this project is try to track down the history of each of the elevators. We have pictures of ones when they were first built, but they don't look like [laughs] the ones that are there. So, what do you recall?

BR: Well, Pool 1, they had built the elevator--. **[*…audio skips*]**

NP: Now, Pool 1 is beside--?

BR: Manitoba Pool 1, which is down--.

NP: Right beside C.D. Howe's first elevator, McCabe's?

BR: True, yes. Yeah. Then Stewart, we've built a couple of annexes at Stewart, probably about '66—'65 or '66.

NP: Which ones were the Stewart elevators?

BR: That's now, or was, Sask Pool B, 7 B. Now I guess they still call it B House, Viterra, eh? Yeah. Of course, the one that fell in up at Grain Growers A, that was just before my time too.

NP: Now, was that designed by C.D. Howe, the one that fell in?

BR: Yeah, yeah.

NP: Not one of the finer moments. [Laughing]

BR: Yeah!

NP: So, you said Stewart did a couple of them, so one was B. Do you know what the other one was?

BR: No, they did an outshore annex and an inshore annex at B House. Richardson, they did a big storage annex--. **[*…audio skips*]**

NP: Was the competition then?

BR: That would have been Cook that did that, yeah.

NP: Okay. Any others?

BR: Other than that, no. Probably some more torn down then. Northwestern was torn down. What was the one on the river? A couple of them on the river that were torn down.

NP: I knew them as the Northwestern and the Electric, but I've seen a sign on one of them called PV, or Purves. Purves for Service.

BR: Okay, yeah.

NP: So, on that turning basin there, so you know which elevator was which?

BR: Northwestern was the one on the turning basin.

NP: There were two on the turning basin.

BR: I don't know of another one.

NP: Okay.

BR: There was just the one, and then there was the Westland was the other one on the river that they tore down.

NP: The Westland D?

BR: That was just downstream of Industrial Grain, Pool 8.

NP: Right. **[*…audio skips*]** I'm just thinking of my--.

BR: No, downstream. Where are we going here?

NP: Westland D was on the corner just beyond Consolidated and then Ogilvie's or Pool 8.

BR: Yeah, Ogilvie. Yes. That which I call IGP [Industrial Grain Products]. Yeah, Pool 8. Yeah.

NP: Empire Elevator was still around in your day, right at the mouth of the--?

BR: Yeah. Uh, no. It was gone.

NP: It was gone already?

BR: Yeah, yeah.

NP: So, that's the other part of our puzzle is when did they go. Yeah.

[0:40:06]

BR: Yeah.

NP: Any different construction on P&H [Parrish & Heimbecker], or was it--?

BR: Not that I know of. C.D. Howe and P&H didn't have a lot of communication. I think there was a personality conflict somewhere in there.

NP: Ah. Like any business, a lot of it is--.

BR: Yeah, yeah. I mean, that was the same thing with Cargill. Cargill and C.D. Howe did not work together. That came out of a grain elevator that they built in Baie Comeau. The story I've heard is that the Cargill engineer enforced design features on there that didn't work. Of course, didn't take responsibility for it afterwards. "It was all C.D. Howe's fault," and so on. So, they never worked together after that. It was rather acrimonious. There was a big lawsuit. But again, that was before my time. I've heard about it.

NP: Just for research purposes, when you were talking about the elevator or the silos that slipped into--.

BR: Yeah.

NP: Who comes in and does the investigation in that instance? Is there a body that looks at these things, or they just--?

BR: It would go back to an engineering company, most likely, but as I said, they brought in five different soils experts. I think Terzaghi was one of them. Some very prominent names in the soils. They all came up with different answers.

NP: After the fact?

BR: After the fact, yeah.

NP: Very same, anything with elevator explosions, it seems to me if you're looking for a definitive answer to what causes the explosion--.

BR: In my experience it would be, again, it would be engineers that would do it—people that were familiar with what happens, why it happens, and how it happens—to look in and look at it forensically to see where it started and why.

NP: But the where and perhaps the how, but the why, do they ever come up with the why?

BR: Yeah, sure. It's poor housekeeping and potential for sparks. Like, you never use steel shovels and steel tools and things for clean up and so on because they strike a spark that's hot enough to ignite the grain dust.

NP: Cigarette smoking?

BR: So, if your bucket elevators are such that the buckets may impact the side of the shaft, that sort of a thing, there's your potential for an explosion. If the buckets are steel--. **[*…audio skips*]** Probably prohibited anywhere on a grain elevator site.

NP: However, not necessarily--.

BR: Well, it's instant dismissal if anybody is caught, so it was very strict. It's a lifesaver to not. So, yeah, if you sneak in a cigarette there it's really a stupid thing to do, yeah. [Laughs] Not that it isn't done probably, right? But even possession of matches and lighters and things like that on your person was not allowed.

NP: Yeah. There was a paper done—not a paper, but a presentation done—for the 1952 explosions where Mr. Irwin, who was I think perhaps at the Searle Elevator at one time--. Anyway, one of the managers there did a presentation on smoking and saying what he had seen in his lengthy career. He said one of his best ones was a bird with a lit cigarette butt in its beak taking it up to the top where they roost at the top. So, he was saying, "Don't rule out, in the early time--." **[*…audio skips*]**

BR: From the elevators, sort of a thing, there's no smoking materials allowed. The idea being if you're going to smoke, you have got to get that far away that the likelihood of something like that happening is that much more reduced.

NP: Did you see a change in housekeeping over the years of your career?

BR: Yeah, and you see a difference in housekeeping from place to place certainly too, where some of them you could be wading in grain dust.

NP: So, which companies tend to be the good housekeepers in your mind? Because I would assume it was a management issue.

BR: Oh, it is. Absolutely. Yeah. There's money involved kind of thing. How many people do you need, at that time, sweeping and all that sort of a thing? No, I really wouldn't remember where one was a lot cleaner than another sort of a thing. It depends what they're handling too. When they're handling different grains or if they're moving screenings or things around, any one of them could be very dusty. Yeah.

[0:45:01]

NP: When you were--. **[*…audio skips*]**

BR: Well, I didn't finish my career with--.

NP: Or you finished at C.D. Howe?

BR: C.D. Howe was bought by Agra, and Agra was not interested in doing grain elevators. So, basically, they closed the Montreal office. They closed the Vancouver office. They destroyed all the files and drawings and so on and so forth, and this was the only office that continued to operate. But we weren't involved in grain elevators other than very incidentally. We weren't involved in grain elevators, and so they laid off virtually all of the people who had the expertise in it.

NP: So, who else in the office here were the experts in the grain elevator piece?

BR: Pritam Lamba is one. Yves Labrecque who works with Pritam. Terry Foreman, an electrical designer. Who else can I think of? **[*…audio skips*]** Craig MacDonald was another one. There was a core of people. By that time particularly, by the time in the late '80s and into the '90s, a lot of the work across the waterfront here had declined. They weren't putting money into these elevators. They were busy building country elevators across the Prairies.

NP: Why would Agra, why would they destroy files? Just a question.

BR: They didn't have any use for them. They didn't think--. They had the big company mentality that anything over seven years old, you get rid of. But anyway, they just had no use for them. Now, we had files—between the Montreal office and this office here—there was files going back into the '30s. Well, they never destroyed anything as far as design notes and drawings and so--. **[*…audio skips*]**

NP: Ones in the office--.

BR: The ones, what I could, what I rescued I took out of here and gave to the Museum. There wasn't a lot, but enough that it was kind of representative of some of the local elevators and so on. Photograph albums during construction and so on.

NP: The McCabe Elevator, formally the Government of Canada Elevator, which was C.D. Howe's first, I think—at least first for Canada—anything about that elevator that sticks in your mind?

BR: McCabe was a similar elevator to the Grain Commission elevators that were built all across Canada that C.D. Howe himself, when he worked for the Grain Commission, did design of those elevators. The configuration of them is similar to elevators that you see in places like Saskatoon and Regina and Medicine Hat. Things like that. Here, they're on the water. The workhouse is on the water side, and then you've got the track shed between that and your storage annexes. McCabe were all tile silos instead of slipform concrete. Pool 6 is that same sort of a thing. It was twinned. It was basically opposite hand double. So, they built the one side and then they built the other side and had a dock on either side of that one. Then the one on the north side got torn down.

NP: Just taken down?

BR: And then more recently, the one on the south side went.

NP: Where were you when they exploded it?

BR: I was up at Hillcrest Park. [Laughs]

NP: How'd you feel?

BR: I mean, it was--. I don't know. I didn't have a strong emotional connection to it. The only thing that kind of bothered me was they had just put—two or three years before that—the Canadian Institute of Civil Engineers had put a plaque up at Hillcrest, Pool 6, right in front of you. So, it was kind of ironic.

NP: But that's just the way things are?

BR: That's pretty much the way things are. I think the thing that probably bothers me is the fact that you've got a perfectly good dock there that has been just sitting there that they've brought some ships into, but they could've done a lot more with that site to enhance the--.

NP: Ah. Money and time might make a difference there! Any interesting stories that you haven't already talked about that stick in your mind about working on or in or around elevators?

[0:50:13]

BR: Well, I think the one interesting one is the fact that--. Which is it now? Pool 3 [sic] and Canada Malting, the original construction of those two elevators happened at the same time, and they are opposite hand. They are the same elevator, only just mirror images of each other. **[*…audio skips*]** Series of photographs that Lovelady did during the construction of those two elevators. Those are with the Museum, but they really show that whole 1920s. All the construction techniques that were used then that are so different than what we used in the '60s and so on.

NP: Do you know who built them?

BR: Not offhand, no.

NP: They weren't Stewart?

BR: No. Metcalf out of Chicago came up and did a bunch of elevators across the water--. No, I can't remember. Barnett McQueen may have had some part of that. I'm not sure.

NP: There might be something that Lovelady photos that might indicate--.

BR: I doubt it. I don't remember. They weren't much for signs in those days. They just went and built them. Now, all those elevators across the waterfront, of course, were built from the shore of the original lake shoreline out. So, they went and they would progressively--. They would drive the timber piling quite closely spaced, and then they would go out on that with their pile driver and would skate across the top of these piles. They would progress their way out into the lake. They would then drive a sheet piling around the outside of it, fill that with fill, and that became the foundation for the elevator. The ore dock was built the same way. Most of the elevators—and they weren't two sided as far as having sheet piling on both sides of it—but you would have the rail tracks on the land side, and then the sheet pile along the face and at the end of the dock. But they were all built out from the old shoreline.

NP: We've got more land out there than we would have otherwise had?

BR: That's right.

NP: That's why the CNR [Canadian National Railway], which is the Pool 6, when you look at some of the early pictures it's like it's sitting in the middle of a marsh.

BR: That's right, yeah.

NP: And now it's completely filled, that area.

BR: Yeah. Those are all built on what are water lots, essentially. Yeah. There was something that came to mind. But if you look at those photographs during the construction, and you see horse and carts out on the water and that sort of the thing, the way that they

mixed and distributed concrete was totally different from anything that happened when I was active in the construction of these elevators.

NP: How was that different?

BR: There would be a central plant where they mixed the concrete, and then they would have a timber tower that went up that they would lift. Then they would have long chutes that would run across the property that the concrete would slide down and get to the--.

NP: Sort of like just a big version of a chute that came off of the back of a cement truck?

BR: Except they're huge.

NP: Yeah, huge.

BR: I mean they would go for 40, 50, 60 feet. They would be probably 50 feet in the air at least, or higher. Then as they went to do the slip forming part of it, of course, then that same tower could supply the concrete as the slip form rose, building the silos and the headhouse.

NP: So, almost all of these elevators still standing then are concrete?

BR: Yep.

NP: With the exception perhaps of there's one on the Kam River which looks like tile.

BR: Yep. Yeah, those elevators over there--.

NP: That's set for demolition.

BR: Yeah. But there aren't any other tile bins except McCabe.

NP: The McCabe. So, the tile bins, they look concrete. Is that just because they're painted?

BR: They've been painted. They've been coated and painted, yeah.

NP: So, what's the thickness of those bins, then, if they're tile?

BR: Those tiles are about 6 or 7 inches thick.

NP: Really? Wow.

BR: Yeah. There's hoops of steel between each layer. The technology is the same, it's just a different way of building.

[0:55:03]

NP: Do you know when concrete started to be used more?

BR: Well, concrete was used for Pool 2, and Pool 2 was built when? That was built very early. 1918 or earlier than that.

NP: 1923 the new version. I'm just thinking because there was a wooden one at one point, Pool 2.

BR: But I mean, that was probably the first slip-formed concrete elevator on the waterfront.

NP: Yeah. I believe McCabe's, Government of Canada one, was 1912/1913. So, sometime between those two the concrete was used.

BR: Yeah, yeah.

NP: No, earlier than that.

BR: Not that I know of. No.

NP: Why the switch from the configuration that we see at C.D. Howe's first elevator and others?

BR: I think what you get with bigger ships is you get a longer ship, and if you can load--. In other words, your shipping galleries would get longer. So, if you build along the dock, then you've got someplace to put spouts that you can load the ships in more than

one location instead of loading them at one central point and moving the ship back and forth. You get more flexibility in loading your ship.

NP: Does it make any difference to the ease? Does that advantage cancel out any other advantage that there might have been of the other configuration?

BR: No, I don't think so. I think other than you may--. I've never really gone through that pros and cons. When you draw out of the storage where it's across the tracks and remote from the waterfront part of it, you have a different configuration as far as how that grain comes into the elevator and is distributed. But probably there's not a big difference in your choices of how many--. Like it's all about being able to move different silos of grain around and consolidate them or to clean them or to process them one way or another or to ship. So, it's how flexible you can be. Either one of them, it's just how you design them to give you a number of different paths that you can move grain on.

NP: And when you were designing one on the Indiana Prairies, essentially, even though there were no ships, I guess even just loading railcars and so on, that configuration was better. [Phone rings] **[*…audio skips*]** Heading into just some general questions about--. Have you had a chance to say all that you wanted to say about major challenges that you faced related to your experience in working with grain elevators? Major challenges.

BR: I think so, yeah.

NP: In your mind—and this can be broader than just your structural engineering experience—but in your mind, what were the most significant events that happened during your time on the job related to the grain industry? Most significant changes.

BR: Hm. That's an interesting question, but I'm not sure I've got an answer. [Laughs] Well, I think one of the most significant things was the change in the pattern of grain movements. Thunder Bay was a central place that so much grain came through and was processed to the standards the Canadian Grain Commission [CGC] imposed on it, and therefore made them very good, marketable commodities. But it was a port that was limited in its annual accessibility because of winter and ice.

Then you got into the pattern of grain moving to the West Coast, where the markets had changed from being directed down the Seaway to going across the Pacific. So, you started to build more elevators out on the West Coast. Then the next thing happened was they started to rail grain past Thunder Bay and down to Quebec, where they established houses that were similar as far as their cleaning abilities and allowed them to operate year-round. So, that was probably the most significant kind of things that happened in the changes to grain movement and to the use of the elevators here. **[*…audio skips*]** Yeah, that certainly was that--.

[1:00:30]

The other part of that would have been the start to move grain down the Mississippi in significant amounts. Each of those are market related, where the grain is headed. A lot of it is moving towards things like the Wheat Board demise, that a lot of the farmers are looking at selling themselves various commodities and putting trains together and doing all that sort of thing. That's been a big change as well.

NP: You mentioned trains a couple of times in your last comments. When you designed an elevator, what kinds of things--? Any changes? Well, your career spanned when they switched from regular boxcars to hoppers.

BR: Boxcars to hoppers, yeah.

NP: So, from a structural engineering perspective, what difference did that make to your design?

BR: The difference is you don't have a car tipper to empty the boxcars. You've got the same hopper basically underneath the track, and then you have to open the hopper gates and discharge the grain into those hoppers. So, that's really the big difference is that there's less machinery because you're not managing the cars. The speed with which you can unload cars is probably significantly improved as well.

NP: When you have speed, does that make a difference on the structural design? If you have an increased speed?

BR: Not the structural design so much as the handling, the designs of spouts and that, and the automation of it. How fast your scales will operate and what the size of spouts are or how you can distribute that grain with--. They built these turn heads that instead of it manually moving spouts around on the distribution floor, it's all automated now. So, those things made a difference. And that's right, it's all about how fast you can handle a train full of cars.

NP: Who was supplying that type of equipment? Were they people you would be coordinating with?

BR: Oh, yes, certainly. There was various manufacturers that did things. So, there would be a certain group of companies that were related. So, when you went to these GEAPS conventions—the Grain Elevators and Processing Society—all of the equipment manufacturers and so on would be represented there.

NP: Were there any Thunder Bay companies involved?

BR: The Day Company was one.

NP: Anybody around from that still?

BR: Hm. Not that I can think of.

NP: Now, the other piece is—and you were talking about the scales and so on—so there was a switch from, again during your time on the watch, a switch to metric.

BR: Yep.

NP: Digital scales and so on. Or--.

BR: Yeah. Well, that's basically a recalibration of the scale or a switch to metric units rather than imperial ones.

NP: Yeah. Makes no difference from your work?

BR: Not really. Well, you go into a whole different set of measurements, but half the work you do even now is still in Imperial. We're doing work over at Resolute, the papermill, that all the work, all the drawings are imperial. Some of the, like reinforcing steel is something you call up in a metric size, but the design drawings are all imperial.

NP: Will that ever change?

BR: No, probably not. But then I worked in El Salvador, and we worked in three different measurement systems—there was metric, there was imperial, and there was their local Spanish measurements as well.

[1:05:01]

NP: What were you building there?

BR: We were building slipform caissons for a dock.

NP: What's a caisson?

BR: A caisson is a big floating box of concrete.

NP: Oh! Why do you need that, a floating box of concrete?

BR: Basically, you build these concrete boxes—100 feet long, 50 feet wide—cellular construction, and they're slip formed. You slip form the first 16 feet of them on a deck, and then you tilt that into the water, and it slides out. You've got enough freeboard on it that it'll float. Float it out to deep water, complete the slip forming. They ended up being, I think, they were about 60 feet high. Then you position them out in the water where you want your dock to be. So, that was an interesting job.

NP: What would the dock out there?

BR: That port, the port of Acajutla on the Pacific Coast in Central America, is mainly sugar would ship there in bulk and the other commodity would be cotton, coffee.

NP: So, is that a solution for low lake levels in Lake Superior?

BR: No. It doesn't make the water any better. It's still all about water depth and how deep you can dredge and so on.

NP: Speaking of that work--. **[*…audio skips*]** Elevators elsewhere, other than on the North American continent. Where would we find some of these items?

BR: India. Significant number of elevators built in India, but that was--. C.D. Howe had a company, Howe International, based in New Delhi that designed a lot of grain elevators over there. They also did some work in China. They did work on grain storages in Iraq, though those were domes. They weren't silos, they were domes that they built there.

NP: South America?

BR: In Argentina they built, yes. Buenos Aires, they built several elevators there, yeah--. **[*…audio skips*]** As being C.D. Howe designs?

NP: Or do they just look like elevators?

BR: No, they look like elevators, yeah. [Laughing] There may be some local idiosyncrasies, but there's nothing that--. Functionally they're the same machine.

NP: Would they be part of--. Would there be some background material related to those in those files that you mentioned went off to--?

BR: No.

NP: Were they done before your time then, was that it?

BR: Some of that was done during my time. The work in Argentina went on--. Those elevators were designed in the Vancouver office.

NP: So, if we wanted to do an inventory of C.D. Howe designed elevators—C.D. Howe Company design elevators—would we ever be able to find out where they all are?

BR: It would probably be a bit of a challenge. Hm. That would be hard. It would be hard for us to do that, I suspect. Steve Rosler, have you heard Steve Rosler's name? S-L-E-R. I think he's now in New Delhi most of the time now. He lived in Ottawa. Okay, I'm just trying to think of the succession. Bob Steadman was the owner of the C.D. Howe Company, if you will. It was partially employee-owned. In other words, there were shareholders. Some of the senior engineers and so on were shareholders. But Bob Steadman. Steve Rosler bought the company from Bob Steadman.

NP: So, when approximately would this be?

BR: So, Steve, that would have been mid '80s. Then he sold the company to Agra in '91, but he kept the Howe International, the India operation.

NP: Oh, okay. **[*…audio skips*]** Experience. It seems to me that somebody was talking about, "It was not smooth sailing for construction there."

BR: I don't know a lot about it. No. The Montreal office did most of that work. So, people like Boyd Sims Williams. Have you heard of his name?

[1:10:06]

NP: No. What was that first name?

BR: Boyd.

NP: B-O-Y-D?

BR: Yeah.

NP: Williams?

BR: Sims Williams

NP: S--.

BR: I-M-S.

NP: Oh, okay.

BR: He lives in Durham, England now. He retired and moved back to the old sod.

NP: Now there was a Mr. Fleming, so he was before--?

BR: Murray Fleming would have been one of C.D. Howe's partners. He was still coming into the office in his eighties. He still had an office in the local building here. He would come in for two or three hours. Didn't participate in the daily operations, but he was an imposing figure because he was probably 6' 6" or so, big tall man. Interesting to talk to him when you had an opportunity to talk to him. He told a story about the, was it, Maple Leaf Mills? "We're going to build an elevator in downtown Toronto." So, Murray Fleming got on the train, travelled down to Toronto. They looked around the site. He drew on the back of a cigarette package. He drew a pile pattern to start to drive the piles for the foundations, and got on the train, came back, and started the design, because if

you've got 24 hours on the train, you've got some time to think about things, instead of an hour and a half on the airplane and getting beat up in security through the airport and everything else. It's a totally different time. Everything was done on a handshake.

NP: And they built it?

BR: And they built it. Yeah.

NP: Where is that?

BR: Out in Toronto. On the waterfront in Toronto. It was torn down when they did all that Harbourfront stuff—late '70s, early '80s, yeah.

NP: After Murray Fleming then, then would that have been when Syd Halter and--?

BR: Well, even during. Yeah, the managers up before that, Olsen was one of them, and then it was Carl Byers and Syd Halter. But before that, I don't really remember or know. There were people like Bill Peach, who was also a fellow that was one of C.D. Howe's old partners.

NP: Peach as in the fruit?

BR: Yep. I'm trying to think of the old names. Johnny McNeil and Al Bentz and Alf Woodsford.

NP: Bentz?

BR: Yeah, Peter Bentz's father.

NP: Okay, so the councillor.

BR: Doctor--. **[*…audio skips*]**

NP: So, what was his first name?

BR: Al.

NP: Al Bentz, and his son is Dr. Peter.

BR: Yeah, Al retired.

NP: Okay. He might have some stories to tell.

BR: Yeah, he probably could.

NP: Actually, meeting with the daughter of Murray Fleming this summer, she has some of his papers apparently. So, that should be interesting.

BR: Okay. That will be interesting, yeah.

NP: Yeah. What is the sense--? This is a broad philosophical question. From my knowledge now of the history of the grain industry in Canada, we overcame an awful lot of geographical problems, small population problems, to become one of the world's leading grain exporters for several reasons, I think. What part do you think the expertise that Canadian--. **[*…audio skips*]** Grain exporting nation.

BR: Well, you say there is a number of features—geographical features and so on—the Prairies, our climate, all those sorts of things contribute to it. The rail infrastructure, all of that really feeds into the effectiveness of the grain elevators and this location here in Thunder Bay of course because it was accessible by water so far inland. It was really, just like fur trade, it was the gathering point between what happened in the west and what had to go down the river and out to the rest of the world. So, the engineering expertise that made these elevators operate and clean grain to some very high international standards was an important contribution to that whole thing because it made the Canadian grain an attractive commodity, a reliable commodity that you could buy and knew that you were--. **[*…audio skips*]** At all, that's true.

[1:15:20]

NP: That brings into mind the fact that, did your design have to take into account how things were sampled, inspected, and so on?

BR: Some of the equipment that was part and parcel of the operating, of the handling systems, included the ability to sample at strategic locations, and the operation of scales and all the things that had to be done that contributed to that quality of the product

that was being sold. I think the other part of it is you don't see the big international grain companies being so strong in Canada. You see the Prairie Co-ops—the Sask Pool, the Manitoba Pool, the Alberta Pool—those sorts of things versus Cargill and Louis Dreyfus and Peavey and those big companies that were huge in the United States. It really controlled a lot more of the operation of the grain trade and certainly an influence in the whole thing, and that these local Prairie Co-ops were a big part of it.

NP: So, given that the local Prairie Co-ops are gone, the Grain Commission is supposedly taking a--.

BR: That whole trade is going to change significantly.

NP: What do you predict?

BR: I don't have a good feeling about it in some ways. I think that it may be good for the farmers, and it may not. I mean, the farmers, you get a very polarized sort of thing. Some are very for it, and some are not, but I have a feeling that the individual player is going to be up against these big international companies. It's going to be a very different market.

NP: What do you see as—again, crystal balling it—the waterfront? What do you see more of or less of?

BR: Part of it--. **[*…audio skips*]** These days. I mean, your flow of grain could change. Again, it's all depending on where you're selling it to, but certainly, the path down the Mississippi is one of them. The other one is to places like Portland, Oregon. When you get into competitive shipping scenarios of who is going to do all that handling and marketing, it's going to change. I couldn't tell you how. [Laughs]

NP: How would you describe the contribution of Canadian engineers to the world grain trade?

BR: I think there was a body of expertise that was developed in grain handling and construction of elevators that did go around the world. Because there's another place that they built--. C.D. Howe built and designed elevators in England, the Tilbury docks in London. So, they've went around a lot of--. **[*…audio skips*]**

NP: Or would it be mainly the States?

BR: Not significant ones, I don't think. The one that comes to mind is the Metcalf operation in Chicago. But as I recall, there wasn't any real big competition to do things, other than what there was locally between Cook and Howe and that sort of thing.

NP: And Cook was Barnett McQueen?

BR: Cook and Barnett McQueen, those are two brothers, the Cook Brothers. Jerry was Barnett McQueen and Jim was V.B. Cook.

NP: Didn't realize that! Are there any questions I should have asked you that I didn't?

BR: Probably one or two of them will occur to me at some point, [laughing] but not that I can think of offhand!

NP: Keep in mind we can do a little follow up, an annex sort of to the--. But I have a question about--. **[*…audio skips*]** Centre here recognizing the grain industry's prominence in Thunder Bay, and its contribution to Canada—we're not looking small—as a nation actually. So, what would you like people to know about the engineering part? If we were featuring engineering, what do you think would be those pieces?

[1:20:07]

BR: Well, to me it has always been interesting just how the plants operate and what all they do. That you're receiving the grain from the rail and processing and cleaning and storing and shipping, all that. It was always an interesting sort of a thing. From one elevator to another, little different ways of handling things or doing stuff. So, to be able to see that operate in some way—probably as a model or even as a virtual model—would be an interesting thing. Probably virtually would be a nice way to do it, where you do a 3D model or something that you can turn around, you can go inside and outside of it, and all that sort of a thing. I would expect would be a very interesting--.

NP: Speaking of models, have you ever seen a working model around town? Is there one hiding somewhere that you're aware of?

BR: Of an elevator?

NP: Mmhmm.

BR: No. The only model I can think of is when we were doing that Sask Pool Vancouver. That was one of the early times when they started to develop the turn heads, the automated turn heads that would allow the distribution to various spouts. They built a model here in the office with soda straws and a couple of plastic sheets with holes drills where each of these turn heads would operate. Because it was a complicated design process to get all of these spouts where you wanted them to go without interfering with one another, so they did this thing with the soda straws. Now you can do that on a computer, but it was a--. I remember when they were

doing--. Actually, because then you had to draw all these spouts, and there was this old fellow they brought in. We thought he was old—he was 70. I'm almost 72 right now. But he came because he could draw these spouts and the elbows in them and how they would go so that they didn't interfere with one another. So, he would sit there and draft away—everything by hand, of course, in those days.

NP: Are there any—speaking of that—are there any sort of computer files that have the inner workings of an elevator?

BR: It's all on drawings.

NP: It's all on drawings?

BR: The drawings that are in the Museum probably are a good example of that. But what I was describing to you, that would be something that--. There's a three-dimensional modelling program from AutoCAD now that you can take and do that, build that elevator, and illustrate all that stuff. You can go inside of it and turn it any direction and so on.

NP: That'd be a pricey--.

BR: It would cost a few bucks, but it's something that--. The company that I'm working for right now, all of their design work is done using that modelling system.

NP: Do you know the name of the modelling system?

BR: Revit. R-E-V-I-T.

NP: Okay. What company are you working for now?

BR: Nordmann Engineering. They're a mining consultant.

NP: Out of Thunder Bay?

BR: Here, yeah.

NP: Oh, okay! Any answer to the question "What might surprise people most about the work you did"?

BR: I don't think there's anything terribly surprising, but I learned a lot through the process, working in different places. Working in Indiana—our contractor was out of Tennessee—took about three days that I could phone back to the office, and they wouldn't understand me because you pick up the accent way too quickly. Working in El Salvador, I learned a lot about some of the realities of life that are misrepresented here. [Laughs]

NP: Such as?

BR: Well, the politics. The fact that everybody was branded as a Communist in those days, and the Americans would say that anybody that didn't agree with the system was a Communist. Yet you see the people that didn't have enough to eat because all of the agricultural land was taken up with sugar, coffee, and rice. So, the country was controlled by, I think, it was 14 families or something like that–had all the money and all the control of those things. The common people worked for nothing, and they couldn't feed their own people with the rice and beans—which was the fundamental staples of their diet—because they didn't grow that stuff. Because it wasn't commercially the thing to grow to make money for the rich people. So, you learned a lot of lessons. These people aren't Communist so much as they just want to be able to feed their kids.

[1:25:24]

NP: Where else did you work internationally?

BR: Well, those basically were the two places. I was briefly in Argentina looking at some things down there, but that was about it.

NP: Now, if we are to get a centre set up--. We're still hopeful, Bill! [Laughing] I know, sure, you laugh!

BR: No! There's no reason why there shouldn't be. There's enough vacant buildings across the waterfront, there should be some way to do that. But, yeah, it's a problem.

NP: What do you think we should feature from the engineering?

BR: I think the thing that you want to do--. It's interesting to walk people through an elevator, but you don't see much unless it's operating. It's a bit challenging, but if you can do that in—like I say—in a virtual model sort of a thing or somewhere that you can make some presentations of it would probably be very effective. Find lots of these old pictures of what things were like in the ships

and how the ships have changed in size and that sort of a thing. Yeah, really it depends on what you have at your disposal, but it would be nice to see some part of an elevator physically.

NP: Close by?

BR: Experience just how big it is, yeah.

NP: Yeah, yeah. We're doing a display this summer at the Mariner's Hall—one of the new buildings there—and our theme is "The Grain Industry: Then and Now". So, if we were to do the physical structure of the elevator then and now, it almost strikes me as, is it true, there really isn't that much different except they're a whole lot bigger?

BR: Well, then it depends on when then is. But I mean the old wooden houses are quite different. But physically as far as what they do and what they do it with is not a whole lot different. I mean, some of the transportation systems are pneumatic now rather than conveyor belts and so on, but basically, they're a machine and they do things with--. The things that they do it with, they just get bigger. That's probably the biggest part of it. It's all about how fast you can manage stuff, so with the automation and the size of the equipment.

NP: And they're a lot cleaner now, so we should be able to see some old pictures with loading boats and clouds of dust.

BR: Clouds of dust! Probably, probably those to be found, yeah. I mean, when I came here, I can remember how much dustier the waterfront was than it is now–much cleaner now, yeah. I guess that's the other thing that did develop was their processing of screenings. Whereas screenings were just waste, and they disposed of them either to landfill or, often, along the tracks at each elevator. They just were dumped there. They would occasionally catch fire because they were grain dust. The foxes would den up there in the wintertime because they were warm, and they'd come into the elevators and catch rats.

NP: I have a special fondness for the wildlife of elevators, so what—besides foxes—what hung around, flew around?

BR: Foxes. Well, pigeons, big time! The most interesting one I ever saw probably was this in Port Colborne—which was an old Lake Erie elevator—the interesting thing was their marine legs. What happened at that Port Colborne and the elevators down in southern Ontario, basically the grain would come by ship from here to those elevators, and then it would be unloaded with what they called marine legs, which is like a bucket elevator that can be lowered down into the hold of a ship. That would be for local distribution and consumption. So, we were down there to look at basically the condition of the elevator. In the manager's office, there was this cat sitting up on a filing cabinet. He was a huge--. This cat killed seagulls—that was one of the things—but he also

killed the mice. These marine legs were all rope-driven, so the ropes were vulnerable to mice who would chew on them. They had to bring old, retired people in to splice these rope-drives because nobody else knew how to do it. But this cat was one of the maintenance features of the elevator, shall we say. [Laughs]

[1:30:45]

NP: Every elevator needed one! [Laughing]

BR: Every elevator should have one! But none of the elevators across the waterfront now have marine legs because they're not receiving any grain from ships. There's provision--. There are old wells where they were, like Canada Malting still has. There's one area in the inshore silos where the marine leg used to be, but there's none operating anymore.

NP: So, where do they receive it from?

BR: Well, they would have received grain--. I'm not sure where it would have come from, but at one time there was an operative where they would be bringing--. For Canada Malting, they would have been bringing barley in from somewhere, probably southern Ontario.

NP: Ah, okay. I think at Paterson's, one of Paterson's first little fleet was taking stuff from the Kam to the Port Arthur waterfront.

BR: Okay, for deeper draft vessels?

NP: Yeah.

BR: Okay.

NP: Okay, well, this has been a great interview.

BR: Good!

NP: I'd like to thank you so much. I'm going to turn it off now, and just a few little things to finish off and I'll let you go!

End of interview.