PETROLEUM INDUSTRY ORAL HISTORY PROJECT
TRANSCRIPT

INTERVIEWEE: Robert L. Comer

INTERVIEWER: David Finch

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DF: Today is May 16th, 2000 and we are with Mr. Robert Comer at his home at 3623 Utah Drive N.W. in Calgary. My name is David Finch. Now, you go by Bob?
BC: I go by Bob.
DF: Okay. Could you start be telling us when and where you were born?
BC: I was born in Saskatoon, June 11th, 1930.
DF: What were your folks doing there?
BC: My father was a traveller. He travelled for a hardware company, Saskatoon Hardware and Millwork and we lived there.
DF: What does a traveller do, most people don't understand that term?
BC: That's an old term. He would leave on Monday morning and go out to all the small towns in western Saskatchewan and make the circuit and take along his brochures, tec. and take orders for hardware and millwork, arrive back home Friday afternoon.
DF: Did he represent a number of companies or just one?
BC: Just the one company, just saskatoon Hardware and Millwork.
DF: Did they have a specialization, that company?
BC: Well, all sorts of hardware and then specialized millwork, windows, doors. They made various things out of lumber.
DF: Okay, so you could order specific sizes and so on? Now, tell us about your education?
BC: Well, I started out at Wilson School and King Edward School and went to City Park High School and then went to the University of Saskatchewan across the river. We lived near City Park, right near the City Hospital there and normally walked to school across 25th Street Bridge, which in 40 below was pretty cool. And there was always a little breeze coming down the river. I took physics at the U. of S.
DF: Why so. What got you interested in that?
BC: I don't really know. I was interested in science and it was really a choice between engineering and science and I think a couple of friends were taking physics so I ended up taking physics.
DF: So this was the late 40's?
BC: This would have been from '47 to '51, I graduated in '51.
DF: So 1951 you have a newly minted Physics degree.
BC: I do and I didn't know what to do with it. So I had been a member of the Air Force Reserve and I decided well, I still don't know what to do so I spent the summer with the Air Force Reserve down east. Came back and friend of mine had been on a seismic crew the year before, hustling jugs and he said, they're really looking for people in Calgary, so

I decided to come to Calgary and interview for some jobs.

#029 DF: And what did you find?

BC: I found everybody wanted to hire me, they were pretty desperate. So I had offers from. . I interviewed 3 or 4 people and they all. . they were really after people at that time, things were expanding desperately. So I had offers from Imperial and several others and I chose Shell.

DF: Who interviewed you at Shell?

BC: I don't recall. I don't remember who it was exactly at Shell that interviewed me.

DF: So with this big degree what did you do?

BC: I also was interested in electronics so they offered me a job out on a seismic crew as what they called the operator, other people called the observer, which was running the sets of instruments recording the dynamite shots. So I started out as a junior to learn it and worked my way up to an operator. They sent me down to Houston on a training course and then when I came back I was given my own crew and ran that for awhile. Thinking back on it actually, right soon after I started I took over because one of the people was sick and I took over right quickly.

DF: Didn't your wife say you started out jug hustling?

BC: Well yes, the first day on the crew they send you out planting jugs to find out what's going on and helping on the shot point. The first months or so you are a labourer and you just work hard and as an assistant you do, you go out and help the line crews and things like that, so oh yes. So that's something that very few people get nowadays and I've always been very happy that I received that training out in the field. It gives you a little feeling that there are actually people out there doing the work and you're just not getting a bunch of numbers on a tape when it comes in. People are suffering a little to get that for you.

DF: Were there any things that sort of opened your eyes. You didn't even know what to expect out there did you? What was it like?

BC: I knew nothing about it when I got out there but I didn't expect to know anything so it was all new to me. I didn't drive when I went out there so they taught me to drive a power wagon and as one of the guys always says, I hated it when you drove into the ditch singing, Nearer My God to Thee. Anyway I learned to drive a power wagon, if you can drive a power wagon you can drive anything.

#057 DF: That's true isn't it. So where were you that first summer, in southern Alberta?

BC: Let's see. I think we started out working in the foothills west of town here. And it was a terribly muddy summer so we spent most of our time just winching the trucks from tree to tree. We really got very little done. If we shot two or three holes a day it was a really good day. It was not a good place to be, you should be in the foothills in the winter time when it's all frozen up. But that's where we were.

DF: So were you southwest. . .?

BC: Yes, southwest of town. And then we also did a little bit straight west of town, out on the Morley Reserve.

DF: So if you were southwest of town, were you doing geophysics for the field that was found there about this time, the early 50's?

BC: I don't think . . I'm not sure exactly where we were but I think they drilled a dry hole out there somewhere. I'm not too sure just. . . we were always long gone. We do the seismic work and then we vanish somewhere else and then they come along and either drill it or don't drill it and quite often you never hear what happens.

DF: Now, your university degree, was there anything there that was directly applicable to what you did on the crew?

BC: Oh, some of the electronic training, not very much though. But some of the electronic training. It gave me enough of a background to learn what I needed to learn out there in the field.

DF: It sounds like you moved pretty quickly from not knowing anything to being an operator and a crew chief.

BC: Yes, you had to do that.

DF: So tell me, to whatever extent you can remember, what the duties were in that time period of a Party Chief?

BC: I wasn't Party Chief, I was the observer, there was a Party Chief, I became the Party Chief later on. But the observer ran the recording crew. The surveyors had gone ahead, the drillers had gone ahead and drilled the holes and we came along and laid out the cables and fired the shot and recorded the results.

DF: So you're still on paper at this point?

BC: Still on paper. Oh yes, very definitely.

DF: And had you learned how to develop and all those things?

BC: Oh, you learned that in five minutes. That was nothing.

DF: And other details about that time period. Most people today don't know anything about this so any other details you can remember.

BC: Nothing really. The instruments were of course, tube type instruments in those days, none of this transistor luxury. Shell's instruments were a touch more delicate than most. I can recall we had to have a pair of balanced tubes to make sure that in each of the 24 . . . what did we have, yes, we had 24 instruments and so each of them had to have a pair of balanced tubes. So many an evening you spent swapping tubes around to make sure that they were balanced properly and then would record the trace properly. Other sets of instruments didn't seem to be quite so sensitive, they didn't have quite the problems I don't think.

#092 DF: Can you explain this concept of balanced tubes to me, I don't understand that?

BC: It just meant that the tubes had the same characteristics. Within a whole bunch of tubes they would vary a little bit and so you just had to try to get two that had exactly the same characteristics.

DF: And how did you test them?

BC: you would just put them in and run a set of tests and if it worked fine that was great and if one of the traces was not looking like the others then you would have to swap some other tubes in, you'd just. . .it was trial and error.

DF: So how did you advance from being in the field, where did you go next.

BC: Next I went into the Division Office. Well. . .I moved from one crew to another, I started on party 4 and then went to party 162 I believe, and then I went down to Houston for three months on their geophysical training program. Then came back and went into the Calgary Division Office where I was exposed to the interpretation of seismic data. Okay, this is what I've been recording, now this is what you do with it. So I was taught by the more senior people in the organization. In fact, that's how we all learned. Because at that time there were no geophysical courses and so therefore I can recall in Shell there were some senior people that had come up from the States that were various division geophysicist and in the head off ice. It was from then that the senior Canadian people had been taught and now they were teaching us, so I learned from them. So that was Calgary Division and I was supervising a couple of crew, I think out probably in the Drumheller area, I kind of forget, eastern Alberta somewhere, I was looking after two crews.

DF: What year was this that you moved into the Division Office?

BC: It would have to be around 1954 I would think, more or less.

DF: Now, your wife said that she did a bit of chasing you around out in the field, was that at this point or later?

BC: No, that was a little later. I guess we met probably in about 1954 and then I was sent off to Casper, Wyoming to the Division Office there for six months of training. They had a policy of sending people off to other areas for training to broaden their outlook. So I was down there from the fall of '54 to March '55 and then came home and got married at that point.

#125 DF: And your wife's name?

BC: Margaret.

DF: And how did you meet her?

BC: We were introduced by an undertaker. She is a nurse and had trained in Edmonton and she and a friend of hers had applied and got a job in High River. Now, on our crew, on our seismic crew was a young man who had been an undertaker assistant in High River but we were paying a lot more than that, undertaker assistant so he got on our crew and was one of our jug hustlers. Well, unfortunately he, one Saturday evening I guess, he was sleeping in his car after a party or something and the police came along and nabbed him for being "care and control" and he was sound asleep, he wasn't going anywhere. So he lost his license, he couldn't drive for us so he went back to High River and there weren't too many young men around there so they of course, knew the nurses very well. I was down to High River for the wedding of a friend and he was a mutual friend of all of us, so we ended up at a party afterwards. I didn't have a date that night so he said, I'll get you a date so he phoned up the nurses residence and ended up with Marg as my date and things developed from there. A year later we were married.

DF: Now you used a term there, "care and control".

BC: I think that was the old term, if you had "care and control" of a vehicle or something, under care, under control. I don't recall the exact term, anyway it was a charge under the motor vehicles act. So that's why we were introduced by an undertaker.

DF: So once you got married, tell me how it was that she came to chase you around the countryside?

BC: I don't recall the exact sequence of events. I'm trying to think which order this was. After a period in the Division Office, then I was sent out as Party Chief. I started off as Assistant Party Chief in Olds but Marg stayed in town, so we commuted on weekends and once a week. I think we then moved to High River for a 3 month stretch, then back up to Olds for awhile. I don't remember the exact sequence of this. We spent time in Weyburn and at one point I was in Big River, which is northern Saskatchewan for a couple of months and Marg was back with her folks in Lacombe. I don't quite recall where she spent that two months.

DF: Is she from Lacombe? What's her maiden name?

BC: Hall. Her family farmed west of Lacombe. From Big River, then the crew moved to Vulcan and we spent March through August in Vulcan, at which time I was then assigned to the Regina Division. I was taken off the crew and sent to Regina. As Marg said, we bounced around western Canada a little bit, not as much as some crews. Most crews moved an awful lot but we weren't too bad.

#168 DF: Now were you living in rented accommodations or did you .. .?

BC: Rented accommodations. Now, a lot of people that were on contract crews, particularly, used trailers. They'd just hook up behind the powder truck and drag them to the next spot. Shell was quite good as far as an expense policy was concerned and they would pay for our moving expenses you see, whereas contractors didn't pay anything. There's a job in Ponoka tomorrow if you want to be there. So those people, there way of life was in a trailer, just hook it up and move. So we were very fortunate that way.

DF: Any trouble finding places to stay?

BC: Oh yes. Very definitely. Particularly if you hit a town that had a couple of crews in it. It was very difficult.

DF: So if you ended up in a place like Vulcan, where would you go to look for a place to stay?

BC: You asked around. Vulcan was fine, we had a great place. Pincher Creek was a tough spot. One of our friends had an old original stone house and they just about froze to death. Ours looked like a grain elevator with the top cut out of it, it had two ground floor rooms and two upstairs rooms. The man that rented it took the heater with him, so all we had to heat the place was the cooking stove, which had been converted from wood to oil. Marg's sister came down for the November 11th weekend and she was sleeping in the living room and there was a little pile of snow on the floor beside her bed and it was getting bigger and bigger. It was cold. That was the place where we went up to Lacombe for Christmas, came back, lit the stove and what had happened was the stove had gone out but the oil had kept flowing and it had all collected in the ashpit under it. So we lit the stove, it was freezing in there, so we went out for dinner and came back and everything had caught fire and the wall behind the stove was ablaze and the whole house was covered in this oily soot. So we got it put out and moved out, eventually got it cleaned up but we were moving to Olds the next week anyway. That was one little incident. I recall one time in Pincher Creek and everybody know this, the chinook was sitting right over Pincher Creek

and Marg washed a washing and hung it out to dry and it froze and thawed about 5 times that day. The front would just move back and forth and back and forth.

#200 DF: That's great. So where did you go next?

BC: Let's see, Regina. We're in Regina now, in the Division Office and we were there for two years, until '59. Then they were basically closing the Regina office down and I'm not sure why. I'm just trying to think back on why they would do that. I think maybe the government of Saskatchewan had changed their policies somehow and oil companies were pulling out. We moved in September of '59 and I think an awful lot of offices close down by the end of '59. We moved to Edmonton and settled in in the Division Office there. That was interesting. We got a house on the west end, right across the street from a plowed field, 163rd Street, 95th Avenue, nice area, Meadowlark Park. Some of our friends from Shell moved out there too. I'm just trying to think what I worked on the first few years. I did a little work up in the Northwest Territories.

DF: Where?

BC: Oh, Norman Wells and west of Norman Wells, Great Bear Lake. I also did some foothills work in northeast B.C., I worked all the way up from Pine Pass right up to the border. I probably did the foothills first and then did the Territories for a year and a half or two years after that. There was a four or five year period, four year period. Then in 1963 I was picked to be the seismic Project Manager for the west coast, offshore. So that was pretty fascinating. I had a trip down to Los Angeles to find out what they were doing and how things went down there. The summer of '63 we started our work on the west coast of Canada. Shell had all the acreage on the west coast.

#230 DF: Could we get back to that in a minute, can you tell me, the conditions and how you got around in the north because that can be a challenge at times. Were you doing ground based or were you doing any water. . .?

BC: No, this was all ground based. Let's talk about. . . the wintertime, we would fly to Norman Wells or fly somewhere out to the crew and then just get around on trucks. I don't think they had any track vehicles at all, I'm sure it was all trucks. But of course, the roads were pretty bumpy and it was sometimes a pretty long drive to the field. But everything was frozen so it was just a matter of normal operations really.

DF: So you only did winter geophysics in the north?

BC: No, we did one summer. My second youngest daughter was born when I was up north. There we would fly in to a base camp and most of it was a lot of helicopter work. They would lay out the. . . well, we had portable phones and portable reels and the guys would lay out the cables and so on by hand and then move the instruments by helicopter. So we did one summer helicopter work out there. That I was involved in anyway.

DF: Then you say the B.C. foothills, what was the technology involved there?

BC: Same thing, just trucks. It was quite normal. It was a rather frustrating experience though, because the moment you got behind the. . . Triassic outcrop?. . one of them, I think that was it, you didn't get anything. There was absolutely nothing. You'd get pretty good records out in front of the mountains but the moment you got back into them, nothing.

We shot miles and miles and miles. Very frustrating trying to find a place where you'd get records, very difficult.

DF: And what was the reason?

BC: Just the surface conditions, the energy wouldn't penetrate down and wouldn't come back.

DF: Okay, so the west coast operations sound very interesting too.

BC: Yes, they were, they were very fascinating. The first year we moved a crew office out to the coast and took along interpreters. And then of course, we had four boats on the operation. One stand alone boat, the cedar wood was what we called a gas exploder boat. It went along and popped off small explosions every 10-12 seconds I guess it was, I don't recall the details and would take a continuous reading of the sub-surface. It was pretty effective. Nowadays they use a lot of air guns, that was just starting to come in at this point in time. Airguns are much more rugged. You don't have the down time. These were long expandable kind of hose, that would be filled up with gas and then pop and expand and that would put the energy down into the water and into the sub-surface and we would record that and the records were pretty good.

#278 DF: What kind of gas?

BC: I don't recall. A combination of oxygen. . . I don't remember exactly what we used.

DF: Why weren't you using some other. . .like dynamite or something?

BC: Another crew was using some dynamite. This was the one crew, stand alone and it was. . .called continuous profiling. The other crew consisted of three boats, a recording boat, a shooting boat and a fisheries observation boat and it was using dynamite. But we were shooting refraction with that to find out the depth of sediments and to find out velocities. . .a better handle on velocities. And of course, with dynamite you kill some fish so the fisheries observation boat was along to record the kills and see how much damage we were doing. Of course, we had a lot of objections from the fisheries people to start with but as it turned out we killed very little fish and certainly almost no salmon which was the key thing. We always had it, I think we were out there for four years and we always had these two crews. They worked sort of together, they worked in the same area together but not too close to one another because you didn't want the two things overlapping. They would have to be in the same area because we set up a shore based location system, Shoran and used it and so it would cover the south half of Vancouver Island, the north half of Vancouver Island, the Queen Charlotte Sound and up in the Queen Charlotte's, so we had 4 or 5 or 6 different set-ups for the Shoran station.

DF: And what was that Shoran station doing?

BC: That was the exact locations, that was the navigation system we used.

DF: Okay, so the equivalent to satellites today or whatever.

BC: Yes, exactly. Loran was the long range positioning and that would give you. . .boats used that a lot, well a lot of people used that a lot, Shoran gave you much more exact locations.

DF: What does Shoran stand for?

BC: Short Range, something navigation. . . Short Range Navigation I guess.

DF: Good. Now, where all did you do this work off the west coast.

BC: Well, off the west coast of Vancouver Island, right from the south end right to the north

end of Vancouver Island, into the Queen Charlotte Sound all of the Queen Charlotte Sound and up between the Queen Charlotte Islands and the mainland, up to the north end of the Queen Charlotte Islands.

#316 DF: And what did you find?

BC: By the time they'd got around to drilling it, I'd moved, I was doing other things. They drilled quite a few wells, found structures and in some cases they found lots of reservoir rock but not traps. Because as you I'm sure, well know by now, you have to have both the reservoir and the fluids and the traps. In the other cases I think they found some pretty good traps and no reservoir rock. So, I really don't know how many wells they drilled, 8 or 9, something like that out there and no production at all. And then after that. . I think Shell farmed it out to Chevron and then after that the government put a moratorium on it, so I don't think anything more has been done to this day. But I could be wrong, I haven't followed up on it at all.

DF: You were talking about the fish that were killed with the dynamite and it wasn't very many. How close would the fish have to be, for example to the explosion to be injured.

BC: I don't know.

DF: But you say it was never very many?

BC: No.

DF: And the Fisheries Department didn't shut you down so obviously they didn't think it was that big of a problem.

BC: No, and the Fisheries Union never said anything more after the first comment. I think they might pick up none fish, none fish and then they'd pick up one.

DF: What size charges were you using do you remember?

BC: No. 10 pounds or something like that.

DF: Not hundreds or anything.

BC: Some of the bigger ones, we got up to 25-50 pounds. For the long range refraction we would. That could be wrong, that's memory and it was a long time ago.

DF: Now were you involved in any technological changes in this period or was this marine seismic already all established?

BC: No, the leading edge people were starting to use these various things for the continuous profiling. The one thing that we can take pride in and I was part of, was the fact that we used some of this airgun data, we digitized it and then started digital stacking on it. So this was all done in Houston, but we helped develop it and said, this is what we want to do and the Houston laboratory put programmers on it and figured out how to actually do it. This is the one thing we were quite involved in developing that, the stacking part of it.

#360 DF: So by this point it's all computer readable data?

BC: We were putting it on to basic analogue data, just like your ordinary tape recordings, and then they changed that, they read it from analogue to digital and then processed it digitally.

DF: So you were still in that transition stage between the two systems?

BC: Oh yes, very definitely. And I'm going back a little bit and I'm not even sure we didn't do

some of the processing just straight analogue. I may be wrong that we were going digital right at that time. A little vague at that point. But we were doing the stacking and it was interesting because it was continuous stacking, it wasn't. . .that's right, I don't think we were going digital because I think they would take these analogue tapes and they would actually just continuously stack them as they played out the tape. And that was the big thing, they didn't convert and then have all the time in the world to play with it. They actually processed it as it was being played out. Yes, that's right now that my memory comes back.

DF: Good. Now, where did you go after the west coast?

BC: Then we went down to Houston, took the whole family down to Houston. Margaret and I and five kids drove down to Houston in the station wagon and spent three months down there on another training course.

DF: What year?

BC: '65 or '66, I don't quite recall which. Then we came back and I started working up in northern Alberta, interpreting data up in northern Alberta and that was just the time or Rainbow and Zama, so that was the data that I was working on. So that was straight forward. We had crews working out there and I was doing the interpretation. I think there were two or three of us working in the area. Wally Semkow was working an area just south of mine.

DF: Did you find anything interesting there?

BC: Oh yes. Lots. It's a great area for reefs and so on but the problem is getting the land. I don't know that we ever were able to buy the land and drill wells because of it. We'd find it but somebody would outbid us on the land. If you didn't have the land you were in trouble and we didn't. So then that's where I was working at the point where I decided to change careers a little bit.

#407 DF: What brought about that change?

BC: Nothing in particular. Shell had been pretty good to me, I was pretty happy but I guess talking to friends in Calgary. One of them had said, so and so is looking for somebody, he needs somebody, why don't you . . . I don't know, it wasn't that I was mad at Shell. Lots of people got mad at their employer every once in a while and went off in a huff, they'd been very good to me. Anyway the opportunity cam along for me to join a consulting firm and so I decided to do it.

DF: What firm was that?

BC: The firm was called J. A. Legge. It became J. Legge and Associates. There were two people in the firm, John Legge, the principal and Jack Wilson.

DF: What year?

BC: '67, the summer of '67. So I left Shell and came down here and found a builder. Of course, '67 was absolutely a boom time in Calgary. You couldn't find a . . .it was impossible to find a house, houses would go on the market in the morning and be sold in the afternoon. It was absolutely wild. Anyway I finally got recommended to a builder, Art Rempel, who actually just lives two doors down from us here. He finally said, okay and he had this particular lot which he had just got from another builder here and we said, yes

we'll take it. So we built a house. I moved down here in August and immediately went north to supervise a crew up in the Territories up in the Yukon and the family came down, I think about the first of October. We rented a duplex close by here and were there until the house was built in the first of February and moved in here and have been here ever since.

DF: How do you spell Art's last name?

BC: R-E-M-P-E-L, he was one of the foremost builders in Calgary at that time.

#445 DF: Tell me how consulting was different from what you were doing before?

BC: It was till interpretation and so therefore very little difference as far as the interpretation was concerned. Of course, you had to get some clients. But joining an established firm, they did have clients. So I took over working with some of the clients on particular projects and prospects and my background worked well with some in particular. One of the first ones that I dealt with was Western Minerals, Eric Harvie. He had a big expanse of territory up in the Yukon. Now, I never did meet Eric himself, but it was his people at Western Minerals. I had spent quite a bit of time doing structural work, both in the southern foothills and up in the northern foothills of B.C. and these were all structural plays so I did quite a bit of work on his work up in the Territories. In fact the first summer was a helicopter crew that I went up to supervise. Sort of the other difference was, you had direct relationship with a lot of other people outside the company and secondly you had to be sure, things that had to be done you had to do them yourself. You didn't have a support staff as in Shell to help you get things done.

DF: So how big a company was Legge?

BC: There was John and Jack Wilson and myself and I think we had a technician and a secretary and that was it.

DF: You said they already had some contracts, was it your job to get more?

BC: Not particularly. It was assumed that if you had contact, you could get some work in, so much the better. But I didn't have at that point in time. In a large company like Shell you get awfully isolated and you work away in your own little office and you really, unless you're involved in a joint venture with somebody else, you don't meet people outside. Now, I was fortunate, I'd been involved in golf tournaments and that type of thing and so I did know other people in other companies. But for work itself, there were a lot of people that didn't know anybody outside Shell. So it is a bit of a shock to get out into the big world and find out there are lots of other people out there. They also know more within the company. It's a company tradition, Shell, Chevron, Esso, that we know everything. It's a terrible shock when you find out that other people know quite a bit too.

End of tape.

Side 2

BC: We travelled by helicopter or plane or. . .
DF: Yes. But you did get stuck from time to time eh?
BC: Oh yes. If the weather socked in you were stuck, but not desperately. That was the same trip that all the labels came off the cans so it was quite a shock to know what you were going to get eat. The cook was weird anyway.
DF: How did you get people like cooks and so on for your crews?
BC: I don't know. They were just provided. Most of these crews at that point were contract crews and they got the people and they . . .but they were catering services that hired them and there were people that just loved that sort of thing.
DF: But you were never in charge of putting that together.
BC: No, I never had to. You see, when I was with Shell there was a Party Manager who arranged all of that. Shell had three company crews but then they had an awful lot of contract crews that they did.
DF: So what adventures did you get into working for Legge?
BC: I can't think of any particularly off hand.
DF: Well, the technology was changing at the time right, late 60's?
BC: Technology was definitely changing withing the 60's, we were going from analogue to digital and a lot of computer processing at that point so it was a period of very rapid change. I used it. I didn't have anything to do with the actual changing though. But we certainly, as things developed then we took every advantage of them. But yes, things were. . .digital recording and advanced processing, deconvolution, all these good buzz word that you've probably heard often. All of a sudden, within 30 years we'd gone from picking things on paper records to getting a fantastic, more detail out of them now, through processing and stacking. Stacking started in about, I think '61 or '62 I believe, something like that. I can recall Shell's first experiments in stacking, we did some of it up along the Alaska Highway, I was involved in that.

#032 DF: And the theory behind stacking is what?
BC: You get several . . for any one sub-surface point, there's an infinite number of surface points where you can shoot from and record on the same distance on the other side. So what you attempt to do is get 6, 12 pairs of ray paths for any sub-surface point. And then you add those altogether and that gives you a stacked sub-surface point. What it does, is it cancels out a lot of the noise and that's the basic thing between seismic is you want to get a good signal-to-noise ratio. If you get a good signal-to-noise ratio you can see your reflection and you can map the sub-surface bed.
DF: What are all the sources of noise?
BC: Just wind, man made noise, vehicles going by, reflective refractions. In northern Alberta we had a terrible time with energy from the shot, which then travels outward as well as going down, going out half a mile, hitting a buried river channel and being reflected back. Well of course, being reflected back, the seismometers don't know where it's coming

from, all they know is they're getting a reflection. And you would then suddenly see a reflection from this buried river channel, wiping out your reflections from the beds that you were trying to map. So that was very difficult. We had a tough time fighting that particular one. What we managed to do in that one area was that we shot a rather large pattern. That was before stacking. We would then use a big pattern of holes for our shot point and that would cancel the outgoing wave enough that it didn't pose a problem. Stacking though would have eliminated it right away because you would have different ray paths and they would cancel out the noise and accentuate the reflection.

DF: Would you also get noise from minor things in the ground as well, like just coming back off of big rocks.

BC: Oh yes, absolutely.

DF: So it could be a pretty dirty signal?

BC: Yes it can be. Some areas are, other areas, no problem at all. You can just drop a quarter on the ground and . . . southeastern Saskatchewan for example, for dynamite we just basically used a booster cap. A cap that you would put into big charges, we just used that booster cap by itself and that was enough to give you a nice high frequency reflection. Transmission qualities were superb down there.

#063 DF: Wonderful. What other technological changes did you see? How did you learn about these new techniques? If you were in a big company, I could see you would be sent off to a training centre or whatever but you're a consultant by this point.

BC: Well, of course, the companies that brought these in, all the processing companies would be very keen for you to use their techniques and so they would put on courses and tell you all about them or if you had a problem you would go over and say, I want to do this and they'd have a couple of their experts and they'd say, let's try this and let's try this and you'd try it with them and say, okay that works well, let's go ahead and do that. So, you learned it through the industry.

DF: What else did you learn as a consultant that you hadn't learned at Shell?

BC: Thing developed as we went along. In the last few years there's been . . .

DF: How big did Legge get for example, did it grow?

BC: Well, John Legge left in 1971, he went to the States and we became Comer and Wilson and we stayed at Comer and Wilson, with one secretary to the point where we lost the secretary and then we just stayed at Comer and Wilson. So Jack Wilson and I had about 30 years together.

DF: Oh really. So you never got bigger than that.

BC: No, never did. Every two or three years we'd say, shall we expand a little and we'd look at each other and say no, who needs it. We were making a good living and quite happy in the stable of clients. . .we'd lose a couple every year and gain a couple every year.

DF: Where were your offices?

BC: We started out in the Bentall Building and then we got dispossessed from there, the people next door wanted our space. I think we went to the Western Union Building next and moved around from floor to floor. Then we ended up with a small office just off 4th Avenue and 2nd street I think it was. We were there for a couple of years, then they

wanted that space too and we were getting old at that point, so we just took our stuff home and worked out of our homes for a little while and then it sort of slowly faded away. We both lost interest.

#094 DF: About what year did you retire?

BC: About a couple of years ago. I'm 99% retired. I still have one chap, I go down and hold his hand for but I basically faded out a couple of years ago. Jack did a little work last winter and I did a tiny bit.

DF: So why do companies hire you to help them do this instead of doing it in house?

BC: They have too much work to do. So they don't want to staff up for a period. . .it's quite seasonal too. Most of the seismic work in western Canada is done in the winter time because access to the north is then. So they will hire people to supervise their crews. And at this point in time all the crews are contract crews, I don't think there are any company crews. It started out back in the early 50's, Imperial had a lot of crews, Shell had three, Chevron had some, Gulf had a contract company that they used but it was Gulf's crews. So as well as the contractors there were a lot of the company crews. Well, they faded out because they just found out it was much more efficient to use the contractors. You could move them around and not have to worry about them, let them go or pick them up and so on.

DF: How did you last through the booms and busts, you must have seem some of them come and go?

BC: Very much so. We were extremely fortunate. Our clients that we had managed to cope and were going right through it and we survived. I know, particularly in the 70's, one time in the 70's, the bust time there, a lot of our friends, associates, got out of the business or went to the States or went teaching. It was very tough on them and we were very fortunate. We didn't notice a thing, people just kept going. We were also very fortunate at other times too, we'd get a phone call, somebody would say, Bob, I'm sorry but head office says we have to hire our own geophysicist and I'm sorry, we appreciate your work but that's the way it is. And the next day, we'd get a call from somebody and they'd say so and so recommended you and could you come over and do a little job for us. I can't recall that we really ever had time to sit around and do much. We might have a day or two to clean out some of the garbage that had accumulated around the office and then we'd be back to work again. So we were extremely fortunate. Jack and I did very well.

#126 DF: It probably helps that you didn't create a big huge company too.

BC: Well, that's right. That was one of the reasons too, that we kept saying, well. . . You know, we've been through this so let's not do it. Some people have created big companies and done very well in them. Good for them, we couldn't be bothered. Inertia too. We're happy the way we are, let's leave it.

DF: What did you enjoy most about your career, the science, the technology, the people, the discoveries, the travel, what was it that kept you intrigued?

BC: I think a little bit of everything, particularly the people. The science was great too. I think back at the changes we've been through, it was marvellous. And the people. . .travel,

well, that was interesting. That was an area that I haven't touched on before but in the 80's I got a phone call from Barry McVicor, of Reid, Crowther. I didn't really know Barry, I knew of him and knew his name. But Reid, Crowther had been approached by CIDA to put together a package for Pakistan, consisting of 3 seismic crews and a computer centre and they were to be the consultants. Of course, Reid, Crowther are engineers and didn't know anything about the seismic business but they did have the political connections to get the contract. So they needed some help, so somebody had recommended me and Barry phoned and said, would I be interested in joining their team to do this and I said, yes very much so. So that was a very fascinating experience, to get exposed to first of all, the government, the bidding on this, the putting together all the documents, boy they're involved. And the selection of the contractors, the training of the people, seeing the equipment is assembled and then trips to Pakistan. Fascinating.

DF: So tell us more about this project in Pakistan?

BC: As I say it was very interesting. They had 12-15 people over here for training so I got to know them quite well. And then the commissioning of the crews, there were a team from CIDA and myself, and Reid Crowther that went over for the actual start up of the crews, to make sure they were working well, to start up the computer centre. Western Geophysical was the prime contractor. They built the equipment and provided all the people. So they had a team of 6 or 7 people that went over with the equipment for a three year period to train the Pakistani Oil Company, OGDC on the equipment and give them training on the software development, hardware, field crews, operations people, mechanics and so on. So it worked out well and then . .

#168 DF: What year was this more or less?

BC: Early 80, late 70's maybe. I'd have to go dig out my little book. I've still got my books from that period of time but something like that, late 70's probably.

DF: What kind of books?

BC: Oh just my log. . .my diaries on what we were doing.

DF: You kept diaries of all the work you did over the years?

BC: No, but on that project I did. No, I certainly didn't. So then later on I had 3 or 4 follow up visits over there, to evaluate the crews, to make suggestions, to see what was going on. Then in '87, I guess my last trip to Pakistan was with another group to see how the projects were going there. So that was a very interesting project that I was involved in. during this period of consulting I spent, we had both short projects and long projects. One of my longest was that I worked for Pan Canadian for a period of 7 or 8 years, almost full time. First of all, working in their United States, in their over thrust belt. They had put together a group of people, just when the over thrust had become interesting and they put together a little team and I was the geophysicist to start with and then one of the geophysicists near the end. And other parts of the United States. Then when Pan Canadian established a Denver office and they took over those projects, then I worked for them up in the, mostly in the northern areas, some of the foothills and northern Alberta. Up until, the, what was it 1984 oil crash, when they let go all consultants. And that's fine, I was . . .that's why you use consultants.

DF: Any other interesting places you've visited in your travels?

BC: In 1987 I was elected President of the CSEG and just at that time we had received an invitation from China, through Roy Lindseth basically, to send a group of people over there for a conference. I was basically told that I was to go, as President that was. . .Bob, you are going. Okay, all right. So, a group of us, probably about 15 all told, went over for a week's conference and . . .

#208 DF: So go ahead, you're off to China?

BC: Yes. We started off with a gang of 10 or something like that but we did a bunch of sight seeing to start with and then ended up outside Beijing at the geophysical centre, Zhou Zhou, I think that was the name of it for a week's conference, gave papers. So that was a very interesting trip. It was a mixture of sight seeing and conference with them, met a lot of very good people over there. They have some very interesting things going on. Out of that came a little bit of work for John Boyd and his group. John was there, John was President of the CSEG just before I was and he was along on the trip. I think that's about all the work that came out. Roy Lindseth was doing a lot of work over there at that time and really, is why this trip came about. So that was a pretty interesting trip.

DF: Now, was it a joint convention with their geophysical association or was it. . .?

BC: Yes, they brought in a whole bunch of geophysicists and we took our small group over there and had a week of joint papers.

DF: What other highlights from the year you were President of the CSEG?

BC: The continuing work on the Geophysical Atlas I guess was one of the highlights. It had ben started the year before and it was finally completed in the year after mine. I wasn't very deeply involved in it. What I did do was get Ralph Lundberg, who was my Vice-President and who was going to be the President when it was competed, to do all the coordination on it. So I can't take any credit for any of it but it was one of the big things that was going on at the time I was President. I think the only other thing I can think of was that our relations with APEGGA improved a little through our work. Registration of geophysicists was always very difficult and we managed to get through some changes to the registration process that cut down on the complaints an awful lot.

DF: What was the tension there?

BC: Just in the registration. They demanded certain things, academic things, which was very difficult for us to reach and we managed to get some changes made to that.

#245 DF: Isn't it true that even more so than engineering and geology, geophysicists are even more so out in the field and that's where a lot of the experience is picked up and from other people in the company and so on, so it's not always as academic.

BC: Well, it was, it certainly was. That's probably not true anymore. The people that are now graduating in geophysics have a very full schedule of geophysics classes and geology and so on.

DF: Okay. But you have no paper qualifications as having taken courses in geophysics do you?

BC: None whatsoever.

DF: And that's very typical of people of your generation.

BC: Of that generation, absolutely. One of the better interpreters had a degree in agriculture. I'm very serious. But as in most things, you never use more than 5% of the stuff you learn in university anyway and most of the learning is picked up on the job, even nowadays. But certainly no, we had no formal background in it at all.

DF: Any other parts of your career, any regrets, anything you wish you'd done that you didn't get around to?

BC: No, I don't think so. I think I've been very please. Another aspect of my career is that I did get involved with APEGGA. I served on council for 3 years, from '90-'93. I had served on various committees of theirs and then I did serve on council. I'm currently the Alberta Director to the Canadian Council of Professional Geo-scientists, which is a coordinating council for across Canada of the various licensing associations. Now, this differs from the technical societies but are the licensing associations. That's been very interesting. This CCPG really just started two years ago. Up to that point, geo-scientists had been registered in Alberta and British Columbia and the Northwest Territories and slowly registration was being granted in other parts of the country. So finally we were able to get this coordinating council started and it's going well.

#276 DF: And is it levelling the playing field?

BC: Well, I hope so. The biggest thing that we're hoping to do is obtain mobility agreements. Of course, once you get licensing, which is a provincial jurisdiction, then every province says, we want to license you, if you're going to work in our province you have to be licensed. Then of course, if you have to be licensed then you have to go through all their admission requirements etc. and it's really quite a pain. So the first thing we hope to do and we're doing it right now is standardize admission requirements to all the provinces and once we can do that then we can get a mobility agreement in place so that you can then first of all, take your membership and just move to another province and say, here I'm a member, enroll me. That would be a big step and the next step and that's one that we're just going to start working on now, is that you can just actually go and work in any part of Canada without too much problem and with very little extra expense. Those are the big things. The mobility is the big thing that CCPG is working on right now.

DF: So do you mean to tell me that you didn't have mobility in your career, it sounds like you did?

BC: Well, we did because there wasn't any licensing. There was no problem. Kind of there still isn't much of a problem yet, but if the provinces every start getting to the point where they're saying you're going to have to be registered here, then you do have to do that.

DF: So how many other provinces have the equivalent of APEGGA?

BC: There's 8 at the moment and another two will be on this year I think. Everywhere except the Yukon and Prince Edward Island, hopefully by the end of the year. Quebec is sort of a different situation, I don't know whether they'll ever get it. The legislature passed it but the PQ's have never declared it. Their social scientist say, now we don't want right to title and so on, so whether that will every happen or not I don't know. There's a push for it now because of Bre-X. The Ontario stock exchange, or Toronto Stock Exchange, Ontario

Securities Commission, have brought out new guidelines, which involved the concept of reports being signed by a Qualified Person, a QP, who has to be a member of an association with disciplinary powers. So Ontario will have, I hope this year, the legislation is in the legislature right now, giving the geo-scientists in Ontario, the required organizational structure and permits and right to title etc. So there may be a push for that in Quebec too, I don't know.

#318 DF: So when did this accreditation or licensing become required, is that fairly recent?

BC: That started in. . .well, the geo-scientists could be registered in Alberta, way back in the 20's and some were. But you were then probably a mining engineer. Then in 1955, the act was changed to allow registration and in 1960 the APEGGA started registering professional geophysicists and professional geologists. APEGGA. . whatever is was, it changed it's name in '65 to APEGGA. Then in I think '88 the Territories started registering and in '90, B.C. started registering geo-scientists.

DF: When did you become a member of APEGGA?

BC: Some time in the early 60's. I was working at Shell at the time and I don't recall exactly what year it was.

DF: Was it required or was it just something you wanted to do?

BC: It wasn't required and in fact, at the moment there's still only about 65% of geo-scientists that are registered with APEGGA. Even though the laws say that you have to be, that's the way it is at the moment.

DF: So people just sort of grandfather it in, or they just keep working even though they're not members?

BC: Yes.

DF: And it's not a cause of concern for anybody except APEGGA?

BC: That's correct. Which leads to a lot of discussions in APEGGA, as you can well imagine.

DF: Anything else about your career you'd like to tell us.

BC: I don't think so. I suppose if I thought about it for a long time I might, but no, it's been a wonderful career. I think I've been extremely fortunate. I've seen the science develop from the basics to very elaborate things that they have nowadays, surround around rooms and 3-D, 4-Ds now, terrific change. Very fortunate in knowing a lot of people, very happy with my career.

DF: Now, I notice from this poster over here, with a windmill on it and from your green Club Enmax card that you seem to have some interest in some alternate technologies.

BC: Well, I do. I have a son-in-law that runs that one.

DF: Oh, well, that would be a reason, a very good reason.

BC: He's one of the partners in Vision Quest, which is the company that runs those big turbines down near Pincher Creek and provides energy to Enmax.

DF: And what do you think of the future as far as energy?

BC: I don't know quite what to say about that.

DF: Here's where I'm trying to get you to go, I often tell people that if it weren't for the fact that Alberta had so much coal, oil and natural gas, we'd be right at the leading edge of solar and wind technology because we have lots of both. But because we have those other

three we've sort of been kind of lazy in developing things like this and in developing solar power. We've got all kinds of sunshine here and even on a day like today that's overcast, you could still collect a lot of solar energy. So we've been really blessed in a lot of ways, but where do you think the future lies, are we going to just keep relying on oil and gas?

BC: I think so. I suspect so. I think we will attempt to encourage wind energy. I know nothing about solar energy at all, but I do know a little bit about wind energy from my son-in-law, so I'm sure we will attempt to encourage a little bit from the green aspects point of view. It's becoming competitively priced now. But I think we have such reserves of coal and oil in the tar sands and gas, that I think the majority will still be from that. There'll be some small hydro developments, as there have been over the last few years. But I think the majority will still be the way it is.

DF: But the price of gasoline now is quite cheap. It's back, in real terms, like it was in the early 70's. If we hit another crunch, another crisis, do you think that's going to spur people to smarten up and quit driving 4 x 4's and big trucks and so on?

BC: No, not really. I don't think. If it doubled in price like it does in Europe then people would drive smaller cars. But if it only jumps 10 cents, people absorb that, they complain bitterly but absorb it. I don't see that there will be any change.

DF: They complain bitterly for a week and keep doing it.

BC: Exactly.

#397 DF: Where do you think our future energy sources are going to come from?

BC: In Canada, Alberta, tar sands. I made a visit to the tar sands for the first time in September and was over whelmed by the magnitude of it, it's fantastic. I'm sure you've been up there often. I hadn't been and I just can't conceive of the amount of work and what's happening up there. And quite obviously it's very apparent that our normal, conventional oil is dropping off very quickly. Gas is still hanging in there but it could start dropping but the tar sands is the place where it's going to expand.

DF: Yes. Well, and the gas, we're going further afield to get it, up into Fort Lliard, the Territories and even when we do find it we end up exporting most of it, so it's not like it's going to be here forever.

BC: Right. At some point we will cut back on the exports and start holding it. It's a depreciating asset.

DF: But you're right the oil sands are just a huge resource and we don't have to go looking for it, we know it's there.

BC: It's mind boggling, I can't quit talking about it.

DF: How about the in situ, isn't that quite a development?

BC: I don't know anything about it so I don't have any comments on that.

DF: I have a friend with them with Esso up at Cold Lake and to be able to develop the tar sand resource, right in place, without having to take off the over burden and all that big trucks and equipment to move it. Putting in steam and hot water and so on, in some wells and pulling out the oil in others, that's interesting idea too.

BC: Oh yes. And I know several companies have pilot plans on it too, but I really know

nothing about it, I don't know where it is in development.

DF: And you belie your age by calling it tar sands because about in the 60's or 70's, the Alberta government consciously chose to change it to oil sands. Tar sounds dirty. Anything else you'd like to share with us today.

BC: Nothing that I can think of.

DF: Well, it's been most enjoyable. You keep thinking of new things to talk about though.

BC: Probably in another day or two I'd have another couple of things, but not off the top of my head.

DF: Now your wife said she was going to remind you about some things, any of those come up, did she make any notes for you, make sure you didn't forget something?

BC: I don't recall. I don't think so. She may have done and I've forgotten.

DF: Well, at this moment I'd like to take this opportunity on behalf of the CSEG and the Petroleum Industry Oral History Project to thank you so very much for spending this time with us and we'll end the interview at this time. Thanks again.

BC: Thank you.