

PETROLEUM INDUSTRY ORAL HISTORY PROJECT  
TRANSCRIPT

INTERVIEWEE: Eric Mountjoy

INTERVIEWER: David Finch

DATE: October 2001

DF: Today is October 29 in the year 2001 and we are with Dr. Eric Mountjoy at 3778 Grey Avenue in Montreal, Quebec. My name is David Finch. Could you start us off with where you were born, I think that's an important part of the story?

EM: Okay. I was born and raised in Calgary.

DF: What year?

EM: 1931. And grew up there and took all my schooling up to high school. I was fairly active in a Scout troop there, the 18<sup>th</sup> Troop and almost every summer we were out in the mountains camping and hiking. This led to an interest in the mountains and that, together with a geology course in high school, I think, whetted my appetite for geology as a potential career. However, I didn't have enough money, nor did my parents, to send me to university so I was essentially, after high school, just searching for something to do. And notice an ad in the newspaper one day. . .

DF: So this would have been the late 40's.

EM: No, this would be 1950. There was this ad advertising a position for a technician and I applied to it and got the job. It was to work helping Dr. Jack Goodman of Secony Vacuum Oil Company, which was later Mobil Oil, to help him with photography which was one of my hobbies, preparing pin sections and sampling core and other duties like that.

DF: In Calgary?

EM: In Calgary. This was the time that the oil industry was starting to expand, with the discovery of Leduc in '47 and so on. Some of the major oil companies from the U.S. were starting to become involved and interested in Alberta. What Dr. Goodman was doing was hiring promising young people for the purpose of encouraging them to continue their studies. So he would hire you on for one year and expect to take on somebody else the following year. It was up to you to save up enough money to go to university. Which I was able to do and he advised me to go to UBC rather than University of Alberta because of the younger, dynamic staff at UBC. I also had the advantage of going into geological engineering and there, the first two years were the same so if you didn't like geology you could switch into civil or mechanical or some other part of engineering. I think I was about the third person that Dr. Goodman had helped, there were two others before me and he continued to do this for a number of years afterwards. In addition to that, the company hired me on each summer for a couple of years and that was also a great help. In '52 the project was on the Liard Range, northwest of Fort Liard. It was a helicopter based project and I think it was one of the first and the following summer in 1953 I worked on a project involving the Devonian stratigraphy of the front ranges between Banff and Jasper. That

was a pack horse party headed by a Dr. Jack Usher of Queens University. All this, I think, is an excellent example of what one person can do to influence and encourage people to a profession and provide opportunities for interesting jobs. So that's sort of the early history.

#043 DF: Now were you interested in petroleum geology at this time? Like, you were working with the oilmen, like Goodman, he was definitely a petroleum geologist but had you decided to go into petroleum geology at this time.

EM: No, I was keeping my options open. That's why I took geological engineering and didn't have to make up my mind until the end of 2<sup>nd</sup> year as to where I was headed. I was interested in most aspects of geology but certainly, being based out of Calgary, you had experience mostly with sedimentary rocks, which is sort of petroleum based if you want.

DF: Were these pretty exciting times too, with Leduc and the oil industry booming, did that affect your interest?

EM: Well yes, it meant that there would be a job at the end of university, that was for sure. But I found my interest increasing on the research side and I knew in my 4<sup>th</sup> year at UBC, my final year that I wanted to go on with further studies and could see how interesting work was available to those people who had gone on to finish their doctorate and it would open up all sorts of doors for you having the advanced degree.

DF: So how did you decide what to do for your doctorate?

EM: That was partly circumstance and partly my own interest I guess. I had written to about 4 or 5 different universities and gotten various responses from them but I felt I got the best response from Frank Beales who was at the University of Toronto. I also met my wife Anita, in my last year at UBC and she was from the Toronto area so these two things seemed to match and that's what led me to taking my doctorate at the University of Toronto. But I should go back to Jack Goodman just a little bit. I need to look it up here. He was Secretary-Treasurer of the Society when I was with him I think. Yes, in 1951 Jack was the Secretary-Treasurer of the CSPG and I think, through him I got some field trip notes and stuff like that so I could go along the old Calgary-Banff road and look at some of the outcrops and begin to understand what was in some of those.

DF: Now in 1960 you were awarded the best PhD thesis prize by the ASPG, can you tell us about the ground breaking nature of your study?

EM: Before that, I should maybe continue the connection.

DF: Okay, sure.

EM: It was through Frank Beales that he arranged an interview with people that he knew at the GSC, Geological Survey of Canada, in Ottawa. People like Bob Douglas, Digby McLaren and through that connection they arranged a project for me to work on for my PhD. I had a choice between essentially 2 areas, one the pass just south of Kananaskis Lakes on Route 40.

#087 DF: Highwood Pass?

EM: Highwood Pass, that area. Or the Miette map sheet in the eastern part of Jasper Park, along Highway 16. I decided to choose the Jasper area because it looked more interesting

and less known about it. I discovered, once I started the mapping, that there was a whole host of new things to determine. Everything from the glacial geology to stratigraphy to palaeontology to structural geology. So the thesis was primarily focussing on stratigraphy and structural geology. Most people would do a thesis on one of those topics not both. And in the map area was a Devonian reef complex, the Miette reef complex. So a major focus of the thesis was outlining the geology of that reef complex, which was of direct interest to the petroleum industry because you could see, in outcrop, the lateral variations much better than you could work out in the subsurface. Secondly the structural geology was just fantastic. You have thrust sheets that vary from unfolded homoclinal types to very strongly folded ones, at Roche Miette and Roche Pedri and the eastern part. What was unusual was the whole northern part of the Miette Range had these structures which were overturned. They'd been pushed up and actually rotated from underneath by the underlying thrust faults. So you ended up with fold structures that have their actual plains dipping northeast. Whereas normally they would be dipping southwest. So I came up with an explanation for the origin of these structures. In addition to that there was also glacial features and at the time I was doing this work Archie Stalker of the Geological Survey was mapping the essentially, foothills and plains area to the east. He mapped, in the glacial deposits, in the adjacent plains, glacial erratics, quartz sandstones like the big erratic at Okotoks and didn't know where they came from. The source was still to the northwest somewhere. In my field work I noticed that these quartz glacial erratics were on tops of the mountains in the Jasper area. And it didn't take much to put 2 and 2 together, that the quartz sandstones of the Gog formation were the source of these glacial erratics.

#127 DF: So you're the man who found out where the big rock came from?

EM: I think so.

DF: Don't be shy. It sounds like your research proved it.

EM: Anyway I'll show you this reprint which was published in the then, Journal of the Alberta Society of Petroleum Geology, in their volume 6 in 1958 showing the generalized map, the erratics have been found out here by Stalker and then I observed them on the tops of the mountains in the front ranges and it's this shading, this stippled pattern here is where the Gog is outcropping in the main ranges. So that was a very interesting discovery and connection. This map by the way was drafted on a table that we had in the kitchen in our cook tent my 2<sup>nd</sup> summer in the field in the Miette area. So it's all hand drafted.

DF: Wow. Where did you learn how to do that, in the field?

EM: In engineering.

DF: Oh, in engineering, okay. So these are your initials here aren't they?

EM: That's right.

DF: Now is that erratic down by Okotoks, is that the furthest that this. . .

EM: No, it extends south for the U.S.-Canada border. It can be traced for I guess, 400 kilometres or so.

DF: Wow. That's amazing.

EM: Well, it is. And some of the erratics are. . well, quite large, as the Okotoks erratic is.

DF: Did you know they wanted to turn that into gravel?

EM: I'd never heard that, no.

DF: A Calgary company was trying to get a permit to turn it into gravel, crush it. So finally they made it into a historic site. Put a little parking lot there and a fence around it and so on. But they were going to turn it into gravel.

EM: That would be disaster. I can't understand somebody wanting to do that. Because that's been a popular visitors site for years and years and years. Anyway, it's easy to distinguish that sandstone. It's colour, the sedimentary structures in it, the grain size. There's no other formation that has that characteristics. So there's lots of other gems in that map sheet as well. In my 2<sup>nd</sup> summer on it I had Roger McQueen as senior assistant who later joined the Geological Survey and Walter Nassichuk. He was a Director of the ISPG at one point. But he had a very strong interest in the palaeontology and as soon as we saw any fossils he was busy collecting. We ended up with an enormous collection of fossils that summer. He would even go back after supper, back onto the outcrop to do more collecting. I remember finding some beautiful ammonites up the Rocky River and these were from the Jurassic-Fernie group and I'm not sure what they were but I realized they were well preserved and excellent specimens. We met with Dr. Hans Fربول of the Survey who was the Jurassic palaeontologist at the time and he couldn't believe his eyes when I showed him these fossils. He'd been searching for these fossils his whole career.

#175 DF: Yes, when you made a find like that, pardon me, it's my job to ask stupid questions, but how did you then locate them so that you could go back and find them again?

EM: Normally you're measuring sections you see. And that is bed by bed, recording what's there. And there's distinctive features in most of these rocks, certain beds that you only see once or rather unique, so it's often. . .and you use the stratigraphic position, super position of different layers and so on, and the arrangement.

DF: Okay, I understand ??? formation but like, you're out in the middle of nowhere and you didn't have GPS or anything, how did you. . .

EM: Well, we were using air photographs to locate ourselves. So you could pinpoint pretty well where you were on the air photographs. And you could find your way back to most locations. And most of it was etched in your memory bank anyway, the interesting locations, special places and so on. I could take you back to that Rocky River outcrop tomorrow if you wanted. That brings up the point of course, with the work, we were also cutting trail to get into different parts of the area. The Rocky River trail had been abandoned by the parks people but we kept it open. So some of our work involved cutting trail, or cutting new trail around places.

DF: And what were obstacles, dead fall and so on.

EM: Oh, lots of dead fall, yes. We tried to get the camp place close to a point where you could work out of for a week or so before having to move again. In those days there was lots of horse feed.

DF: Lot's of horse feed?

EM: Yes, lots of grass for the horses. You see, nowadays the parks people are concerned about over grazing. I don't think it's a problem where they think it is. And that limited I think,

some of the horse parties now. It would be very hard to hire one now I think.

DF: Yes, there's some other complications too. But that's another topic maybe for after we get off the tape. Any stories about those horse parties because before we went on tape you were telling me you were out for several moths at a time. So logistics must have been incredible.

EM: Well no, the logistics were fairly straightforward, once you got into a pattern of how things worked. If you had good horsemen there was no problems at all in sort of moving camp and so on. Sure there were some delays and some cases where you had to. . . maybe had a dead fall and maybe siwash through the bush or get around it. But most of that area is reasonably accessible. With good horsemen they would also watch the packs on the horses so you wouldn't have any disasters taking place. Invariably after packing up there was 1 or 2 horses that would try and buck their off. Some were successful of course, and that delayed things.

DF: How did you come to be a horseman, you were from the city weren't you?

EM: Yes, well, you had to get from point A to point B. It was a matter of learning. But in my 2<sup>nd</sup> summer as an undergraduate with Secony Vacuum I was on a horse party there where we travelled between Banff and Jasper and looked at many of the classic sections. I remember the first day we had to ride at least 30 miles I think, and when I got off the saddle you know, you just about collapsed on the ground because your legs wouldn't hold you up. So you have to learn the hard way how to ride a horse and so on. But most of the time they were walking, they weren't trotting or galloping or things like that. I can still remember one instance in the summer Roger McQueen was out. We used the horses to get us out in the morning and we'd leave them tied up all day. So when we got back to the horses they were anxious to get back to camp. We decided to speed up a little bit and started galloping and the next thing I knew, Roger's horse was galloping past me and there was Roger hanging on to the horn, the reins fully slack, yelling whoa, whoa, whoa. And of course, the horse not paying any attention to what Roger was yelling. I think he had to fall off to stop the horse. So what else?

#237 DF: Were you associated in any way with the ASPG at this point, did you join as a member in that time period?

EM: I joined when I went to graduate school at U. of T. I think Frank Beales encouraged me to join both the CSPG and the AAPG and I joined both I think, in 1956. I just knew of some of the activities through Jack Goodman, since he was Secretary-Treasurer, heard a little bit about what they were up to.

DF: But at U. of T. the only benefits you would have gotten would have been the publications.

EM: That's right.

DF: Now don't be shy, I want you to tell me why they gave you the award in 1960 for the best PhD. Certainly yours wasn't the only one that year, what was the significance of that award that you received in 1960 from the ASPG.

EM: I think it was recognizing the importance of mapping that area, geological maps and structural cross sections. And as we've discussed, understanding and explaining some of the unusual structures of the region. In addition to that of course, was the Miette reef

complex, which was of direct importance to the petroleum industry.

DF: Did you consider going into the oil patch at that time?

EM: No, I was interested in continuing with the Geological Survey. My interest in teaching came about mainly because I realized how important it is to train students. My pattern was to spend the first 2-3 weeks in the field actually training my assistant so we had a uniform approach to looking at the rocks and so on. And the field is the best place to teach geology, that's for sure, it's the best laboratory in the world, especially the Rocky Mountains where things are so well exposed. And I understand through the librarian at the ISPG in Calgary that my thesis is the one that's most loaned out of the library, even now. Because unfortunately I haven't had a chance to finish up preparing it for a memoir with the Survey.

DF: So are you going to do that?

EM: I hope to.

DF: So after you got your PhD you went on to the GSC. Tell us about that.

EM: Well. . . to the second field mapping in 1958 and at that time moved to Ottawa. I hadn't quite finished my thesis, didn't finish it until 1960. They put me onto a project of the adjacent area to the north, the northwest, the southeast quarter of the Mt. Robson map sheet, which was a 3 summer project, or a 3 year project I should say. That led to mapping the northern half of the Jasper National Park, right over to Mt. Robson. It was a series of 8 1:50,000 map sheets. No sorry, we would now say 4 because the new ones are double map sheets so it would be 4 of the double map sheets. So again, that was all new territory but having had the base of the stratigraphy and the structure of the Miette area, you could now run with that geology into the adjacent map sheets. Except you started to get into older rocks, the Cambrian was more complete there and the underlying pre-Cambrian was exposed. Which didn't occur in the Miette map sheets, in the front ranges. Now a good part of the area was not well accessible by trail so we had a fair amount of trail cutting to do in different parts of the park. A key area that we got access to was the Snaring River and we cut trail from the mouth of the Snaring up the first 15 miles or so. The normal way to get into that was through ??? pass west of Jasper that dropped down into the Snaring near Harvey Lake. So I actually employed my horseman, with a power saw, to cut the trail up the Snaring. Nobody had attempted that before and we could see why after we started up on our first day. We get up there, about 8 miles in, there was a rocky bluff that was covered with moss and slippery and the horses had to sort of jump a little bit uphill. But the slippery footing, they lost their balance and rolled over sideways, down a fairly steep hillside. We couldn't stop the horses from doing that, they would each try and each would fall down. So we had about 8 horses falling down the hillside. You'd hear them roll over and crash against the trees and then roll a little bit more and crash down further. We had to of course, get the horses up, we had to unpack them, we had to bring the packs all back up onto the trail again. This took us about I think, 6-8 hours to clear up. So we didn't get camped until about 9:00 that night on the first open flat spot we could find on the river. So that's the worst mess I've been involved with, with horses.

#322 DF: And you didn't lose any horses?

EM: No. I thought we would have injured some horses but they somehow must have relaxed as they were rolling down the hillside. Incredible. Anyway, fortunately things went better further up the Snaring, it was a much flatter and more broader valley and you could cut trail on either side. But with the cutting of the trail we were pushing the trail cutters, so one day we were actually, the student assistants were helping out with trail cutting too and one of them had the power saw balanced on the horn of the saddle and in crossing the river the horse spooked and fortunately he was able to throw the saw to one side. But he got his climbing boots caught in the stirrup and the horse was trying to lunge out of the steep bank and he was being dragged in the water. Fortunately the stirrup let the boot loose and Bill was able to get out of the river without being drowned or kicked by the horse. That was one of those scary, close moments I think. One of the worst I've experienced I think, the most dangerous one I've had I think, in my whole career practically. It makes you think how important safety is in these situations.

DF: Yes, that's right.

EM: Anyway, after that, the Survey didn't allow you very much time for compiling your maps. So I got a preliminary map out on that area but the following summer, in '62, I was assigned to help map the northern half of the Yukon with Don Norris of the Geological Survey, who by the way, passed away early this year. But he's been retired a number of years from the Survey.

DF: Any adventures on that mapping?

EM: Oh yes. I was assigned to do the whole Mesozoic of the Yukon and a good half of it is Mesozoic. So it was almost an impossible task to do. I was mapping, I've forgotten what river it was now, anyway, we had a Zodiac boat and unfortunately we went over a falls and ripped the bottom out of it. So we had to get another boat flown in. I think we'd started too high upstream and just too many rock exposures and too shallow water.

#370 DF: Did you ever have any canoe trips?

EM: No, I've not done any work by canoe.

DF: You're not old enough.

EM: I guess not.

DF: Because some of the real old timers with the GSC, that's how they got around in the north was on canoes.

EM: No, we were using Beaver float planes and helicopters, it was a helicopter based operation too.

DF: But you were still doing that, in the inflatable, you were still doing that thing of going down the river, which is an old geology trick isn't it?

EM: That's right yes.

DF: So do you remember what river that was that you went over the falls?

EM: I think it's a tributary of the Peale but I'd have to look at a map now.

DF: Okay, that's fine. So you were with the GSC until '63, any other highlights of that period?

EM: I'm not sure I can think of some right now. I think I spent the next year, part of '63, trying to finish things up. I did get my PhD finished up in 1960, 2 years later than I would have

liked to have but still. I spent 5 years getting the thesis done but when you're put on another 3-4 month summer and you work and had to put out plenary map sheets. . .

DF: You were busy.

EM: I was kept busy. But out of it has come a whole host of other research project that I've been involved with, with my students over the years. Anyway, I guess the next chapter is, an opening came up at McGill and I interviewed for it and just decided to go to McGill because of my interest in teaching young people.

DF: Where did that interest come from?

EM: I think it came from the field work. As I mentioned earlier, training the students and just seeing the lights turn on and see them get interested and excited about what we were doing. So I felt maybe my calling should be directed in that way. And I still had my contacts with the Survey, at least could arrange thesis work with them or arrange other contacts. I'm not sure, Ray Price will be better able to tell you than I, of setting up the Bow-Athabasca project, where we mapped all the unmapped areas between Banff and Jasper at a 1:50,000 scale. And we're still compiling that geology. I've been slow on the Jasper part of it because I've been involved in so much other research at the university. That was a project of, I think it was '65-'67 but the planning for it was started in '64. But Ray knew the geology of the southern part, having worked in the Flathead area and so on and I knew the geology of the Jasper area. So it was a natural for us to sort of work together and in the following 2 summers do the mapping for Bow-Athabasca. As well as, there was other people like Don Cook who did specific parts of it, Hugh Balkwell and Hans Belinsein. Also Jim Aiken was doing the Cambrian sections and Roger McQueen the Mississippian and Dave Gibson the Triassic stratigraphy. That was a really fun group to be with and an exciting time mapping all that area. I'll show you later, after we're finished the interview, some of the map and the cross sections I'm working on right now. But that's something that the CSPG did with their early guidebooks, I don't know whether you. . . .

#454 DF: Okay, tell me about this.

EM: This is the one that Gerry Henderson and Ken North, I think edited, for the 4<sup>th</sup> Annual Field Conference, Banff, Golden Radium.

DF: And the year.

EM: August '54. In it they prepared some regional geological maps. This one is just about falling apart as you can see. Of what was known then of the geology across the mountains, to the Rocky Mountain trench. That's the western side there, for the southern Rocky Mountains. This involves some of Gerry Henderson mapping, near the trench and a compilation of other work and as you can see from the map, acknowledging Frank Beales.

DF: Many people yes.

EM: Dolson???, Bob Douglas, Ken North, Gerry Henderson and so on. That's an amazing map for 1954.

DF: I'll say.

EM: So I see the CSPG, or at that time the Alberta Society, is encouraging and preparing guide



books that would illustrate the geology of this area, what was known and the problems and so on. So it was I think, largely an educational role that they played in illustrating some of the geology and getting people to I think, pull some of this information together. And therefore I think, stimulated a lot of research because from this you could see what some of the problems were, where some of the gaps were in the mapping and so on. And the same thing was done the following year from the Jasper area. This was the 5<sup>th</sup> Annual Field Conference in 1955. It illustrated first, a little bit of the history of the region and then something on the ??? of the Jasper Park and Mt. Robson region by Berling and also one of the first maps, very general maps, between Jasper and Tete Jeune Cache in the Rocky Mountain Trench.

DF: So in your estimation this is some of the earliest of this kind of work and it was supported by the ASPG?

EM: Yes.

DF: A compilation of the work of many different people but an important educational tool.

EM: That's right, yes. And it made it accessible to other people. In this volume it was Dick Hughes's PhD thesis was published and the maps that went along with that. And I'm actually using this in the compilation of the Athabasca Falls and some Wapta map sheets that I'm currently preparing for publication now.

DF: So this information gets used for a long time doesn't it?

EM: Oh yes. It's still useful. That's why the CSPG recently republished some of the guidebooks of the Devonian Symposium of 1987. They just recently put out a series of those.

End of tape.

Side 2

DF: So we have you at the GSC, oh yes, then you applied for the position at McGill. What would you like to say about your teaching and the role of your teaching. . . part of the reason I'm here is to have you talk about your contribution to the western Canadian geological particularly the petroleum geologists. I think you've taught quite a few of those, tell us about that.

EM: I think my contributions are twofold. One was working in the field on a number of projects, the Miette reef complex and Ancient Wall reef complexes were two focuses I had and a number of students worked on both of those to work out the geology in more detail than I was able to do with my PhD. Or the Ancient Wall reef complex, I forgot to mention was in the southeast corridor of the Mt. Robson mapping area. I was actually back there this summer again, with a post doc from Great Britain. So there's still lots to be learned from those rocks. Anyway, there was that aspect and then there was partly, some mapping work. And then at one point it was very difficult to get permits to work in Jasper Park and at that time I finished the Jasper map sheet and the Amethyst Lake map sheet. Which put me into the Continental Divide area.

DF: What was the problem with getting permits?

EM: They didn't want you to use helicopters. They just wanted to restrict access almost completely, except unless you were willing to backpack into places. And it was just too time consuming to backpack. Horse parties were getting fewer and more expensive. It just made it much more difficult to do any field work in Jasper Park. It was mainly the Superintendent was, he looked at things black and white and he preferred to say no, rather than to say, well, in your case we'll make an exception. Even though it was essentially doing work for the federal government they still would say they wouldn't allow us to use helicopters to get access to fairly remote parts of the park. Anyway, that's all eased up considerably now and I've done a lot more work since then in the park. Anyway that got me involved in some rather complex geology in the Selwyn Range. That's on the west side of the Divide, east of Valemount. That's the southwest corner of the Amethyst Lake sheets got me into that area. So there were some rather difficult structural problems. There's at least 2 phases, if not 3 phases of folding and deformation. And you're also getting into higher grade metamorphism in that area. So that led to a series of Masters and PhD projects.

#043 DF: Did many of those people go on to work in the petroleum industry?

EM: Yes. Quite a few of my students have gone into the industry. About the same time, let's see, 1975 I guess, I started to get interested in the subsurface. I've forgotten now but James McGillvary's thesis on Golden Spike was one of the first that outlined some of the subsurface reef faces of the Leduc. It was a limestone build up with really beautiful faces and textures that you could map.

DF: What was the source material for that information?

EM: It was just well cored, excellent core. I've forgotten now, I can't remember how I got onto that but it could have been a colleague in the industry maybe mentioned it. But McGillvary did a Masters project on it and we published on that in '75 so I guess he must have done the project starting in '73 or so. I realized what interesting data was available through the core facility through that project and when Dick Walls came here from the States to start a PhD I suggested he do a more thorough study of the faces and the geochemistry of the diagenesis of these rocks and that's what he did for his PhD, which he finished in 1977 I think it was.

DF: Now the core being part of the public record, that's unique isn't it?

EM: Yes.

DF: Can you talk about that, compared to say, the States or other parts of the world?

EM: Yes, well, it's one of the best core storage facilities in the world. Even in the old days when they had limited facilities you could still get core pulled out fairly quickly and efficiently.

DF: But the Alberta government made a specific decision about this, that's what I'm trying to get you to talk about.

EM: Okay. I don't know exactly, I think the industry pushed them to set up this core facility that would be accessible to everybody.

DF: I think it was the other way around, industry wanted to retain its information for its own purposes but part of the ERCB, what the ERCB did when it was first created was it said,

yes, you can have a period of time when you have proprietary information. . .

EM: Essentially one year I think.

DF: Yes. And then after that it has to become open to the public for academics and other companies and everyone to study. So that level of information has created, in Alberta, an educational tool that doesn't exist in most places.

EM: Yes.

DF: So some of your students were able to use this.

EM: That's right. So that led me to continuing a whole series of projects in the Devonian in particular. With the Miette reef complex it shows partial dolomitization of the margins and I had a Masters student, Bret Mattes work on that and we published the results of that in 1980. My first major paper on dolomitization and realized that in the subsurface you also had dolomatized reefs. So I put a series of students on looking at this and also looking at what we call, burial diagenesis. There's both solution and precipitation of calcites and dolomites going on with progressive burial. And trying to sort out what was causing this and when it was happening. This eventually got me into a lot of geochemical work, and carbon monoxin??? isotopes and strontium isotope work to try and essentially, tag the different phases of diagenesis. And it eventually also got me into fluid inclusion studies of some of the different cements so you could work out the temperature of the formation and the salinity of the waters from which they precipitated.

#095 DF: So this sounds like, and correct me if I'm wrong here, that the industry was giving you a lot of information because of the drilling, the subsurface you wouldn't be able to get any other way except for very expensive drilling programs.

EM: Yes, right. The core was there, very few people were doing much work with it and fortunately they allow you to cut off small pieces of rock to get sufficient sample for doing some of this kind of research. And in 1980 I guess, I had Hans Machel, who's now teaching at University of Alberta and he did a PhD on west Pembina, Niscue reefs. He and I have done a lot of joint publications on dolomites. He has now, a group of students working on various aspects of Devonian stratigraphy and diagenesis. Anyway I'm not sure of the CSPG's role in setting up the core facility but certainly that has provided a wonderful laboratory for samples from different parts of the basin and for different projects and so on.

DF: Tell me more about the relationship between, like the ASPG, CSPG and academia, how they have fostered each other?

EM: I think it could be in a number of ways. In some cases, at annual meetings and so on, setting up research sessions on special topics, probably jointly with somebody in the oil industry. Things like the Devonian Symposium, there were two of those, one in 1967, I think the last one was 1987. Of course, a lot of the organization and so on was initiated in Calgary but I think, in conjunction with GSC people and also some university people. First of all, designing a program and sending out invitations and what have you. So I think there's been fairly close cooperation and coordination between CSPG, industry and academia and the Survey. That's also true I think, of say, the work and input in the two geological atlases that were done. The first one in '64 and again, the second one in 1994.

Look at the authorship on the chapter headings, there's a good mix of industry, GSC and university people, researchers involved in that. And of course, there's the annual meetings and conventions and associated with them now, core workshops. There's a good mix of university people, industry people and GSC people presenting those core workshops. And it allows people to get hands on information, a chance to chat with the authors about problems and so on. So it's very educational I think. The other aspect of CSPG input I think, is through the Bulletin. It's a good outlet for geology of western Canada in general and it isn't restricted to the western Canada sedimentary basin, it involves things like structure and the geology of the Rocky Mountains and other areas as well. So it's fairly broad in its scope. Its main focus is largely petroleum geology but it still can involve structural geology and sedimentology and so on. And including things like glacial erratics that we talked about earlier. But they've also prepared, what I put down here is, geological summaries and syntheses like the oil pools and gas pools volume. That's the only source you have on some of the fields, is the data that's been pulled together by, I guess, a committee that was set up and the committee got various authors to write up the geology of some of these oil and gas pools. So that's a nice resource to have that can be used in teaching or by people in industry.

#158 DF: Yes, the American Association would do the same thing in the States, wouldn't it? Or is there a difference?

EM: I think there's a significant difference.

DF: Why?

EM: I think the Calgary group has been very ambitious, had a lot of forward thinking people. I think that's evident in those early guide books and the first atlas was, I think, unique. It was followed by I think, the Rocky Mountain Association in Denver, their atlas was, I think patterned after that first atlas. So the atlas concept was a first, as far as I know, done by any geological society in the world.

DF: I'll have to check that out because I interviewed Bob McCrossan earlier in the week. He told me about the ins and outs of doing that, getting everybody to agree on colours for rocks and different things like that. But yes, and that was all done before computers so it was a huge job.

EM: Right.

DF: So that's a seminal publication then.

EM: Yes. And another thing is I think, the lexicons of formation names. I think they're still preparing one or two but I'm not aware of other societies having done that. I'm not 100% on that but I think again, that's rather unique to the CSPG. And it's a beautiful resource. It started with an earlier one, I've forgotten what date it would be, I think in the 60's, listing all the formation names in western Canada I believe. And it was just for western Canada but the latest series is for all of Canada and the Arctic. So it's a good reference point if you want to look up a formation name and find out who set it up and the dates and where the type sections are and its main characteristics, it's all there in the various volumes. So it's a very useful tool for people that don't know the stratigraphic sections or the geology of the region, they can quickly find out various aspects of things. The other

couple of things that are unique to the CSPG is of course, the Student Industry Field Trip, SIFT. I think it's the only geological society that does something like that, brings a student from each of the main universities across Canada, brings them together for the 2 week period. So it's great for the undergraduates who go, really a tremendous educational experience. Plus social experience for them, to meet fellow students from all across Canada in a group like that. Get to exchange ideas and learn about differences between the various universities and so on. Also to be able to work together in a team effort, suddenly plunked down with 3 other people on that petroleum exploration game. I think it was Andy Baillie's idea was setting up the portable core displays, which I listed on my sheet there. They had 2 or 3, one on Carbonates and reefs and Gulf Oil was responsible I think, for financing it and pulling it together but they donated it to the CSPG to circulate among the universities. Unfortunately they repackaged it in new containers and I think, in aluminum boxes and these looked attractive to somebody in Ottawa because they got stolen from the shipping docks at the Carleton University. And of course, it was unique, one of a kind pieces of core that was difficult to duplicate. I spoke to Jeff Burrows who was one of my Masters students who was at the time, working with Gulf and they thought they might be able to duplicate but never got around to . . . I guess didn't have the time or didn't have the ??? to set up another one.

#218 DF: That's unfortunate.

EM: Unfortunate but again, that was a unique educational tool. And I used it, I don't know, I think at least for 10 years running. I'd order it for a certain 2 weeks to come to McGill and use it as a lab example of core. Features in it that are just difficult to find anywhere else. So anyway, I think that covers most of the points I could think of that related to the CSPG. I would see the CSPG's role as mainly one of education and furthering geological knowledge and research. And doing it in a variety of ways as we've talked about. It's hard to judge what an impact would be but I think it would be really enormous. And as I said here, I think all you have to do is look at the publications referencing, there's lots of references to the Bulletin and certainly references to core displays and meetings and so on, and the guide books and that type of thing. So it's hard to quantify what that would be but I think it would be. . .

DF: Well, if you took it away it would be a mess wouldn't it?

EM: Yes.

DF: Next year is the 75<sup>th</sup> Anniversary of the CSPG, what else might it do in the future? It's been pretty busy in the past, any vision for it?

EM: I'm not sure. I'd have to think about that and maybe give you an answer later. I've made a note here about the liaison committees and so on, that it's difficult for them to involve people from outside of Calgary and this makes the Society more Calgary based than it would like to be I think. I made a note here that to be a Chair of a committee outside of Calgary would be difficult because they like to meet together in Calgary unless you could be in Calgary I guess, fairly frequently. But on the Medal of Merit committee I was Chair for a couple of years and could run that from Montreal. But then you were just selecting publication lists and then going through a series of votes. So that kind of thing could be

easily done by somebody chairing a committee outside of Calgary. The liaison committee was set up to get input from the rest of Canada and to try and play a role in helping the CSPG maybe, do some new things. One of them was supporting the geological highway map series of Canada. I think the Maritime group pushed maybe, developing videos advertising the industry and geology. I'm not sure that anything came of that. And there were other things as well but anyway, during the downturn in the 90's it was decided that the committee was too expensive for the amount of feedback they were getting so they decided to disband the committee unfortunately.

- #274 DF: From your side as a professor, how do you see that boom and bust cycle and how does that affect students and so on? When they start it may be a boom but they come out and it's into another bust. How have you dealt with that over the years?
- EM: I've always said that there's employment for good people and I think that's proven correct over the years. Your top people will have no trouble getting jobs, even at bad times in industry.
- DF: Well yes, but how about the ones that are almost as good as the top people. There are always times when even the good ones are being laid off. Do you encourage people to see this as long term?
- EM: I say to them, if you're really interested in what you're doing then stick with it. Because in general I think you'll find a job eventually. You may have to wait a year or two.
- DF: Good point.
- EM: But if your interest is really there then I think you'll eventually end up with a job.
- DF: How about diversification too, if there's no jobs in petroleum then go into mining or into academia or something?
- EM: Or environmental geology. Again, it depends. Normally the mining and petroleum are in phase, some of the time. Right now they're out of phase because there's very few jobs available in the mining industry. I think certainly, you have to be prepared these days, to change your job about every 5 years. So some diversification I guess, is important. But what will stand you the best I think, is having a solid foundation that you keep updating. I think education is still going to be a very important aspect of the future for anybody and you just have to keep on learning for the rest of your life, not get yourself dated or out of date.
- DF: Good point.
- EM: That of course, is what the Society is focussing on a lot with short courses and at the annual meetings. And of course, throughout the year they have a lot of people giving courses.
- DF: I notice from your resume that you've been honoured by the CSPG on several occasions. What does that do for you, how do you value those awards and medals and so on?
- EM: It's nice to be recognized I think and see what you've done and what you're written has had some impact on industry. So it's a nice accolade and encouragement to keep on doing the things you've done. I think it's nice to have that support from industry.

- #319 DF: Has there ever been tension between the academic side and the industry side in

geological matters?

EM: I haven't felt that myself. It could be that some academics might say that research in applied areas is not really pristine research. But I've always felt that practical problems make very good thesis projects. There's always something fundamental to try and answer behind the problems or questions that are coming out of industry. Industry sometimes, right now, it doesn't seem to have the time to work on some of this. So by keeping your ear to the ground with your colleagues and ex-students you can ferret out all sorts of interesting problems and projects that I think, are academically, very challenging.

DF: Sometimes industry leads the way too. The discovery of oil at Norman Wells got the GSC interested in doing the Mackenzie Project and so on. So that there's a bit of a dance there isn't there?

EM: Sure. Certainly when I was doing my early field work they oil companies were out there doing field work as well. But they weren't competing with you, they were always encouraging you and they were publishing maps themselves through the guide books and things like that. So I've always found that cooperation has been very beneficial. Now there are some people who are very close to the chest with their information and very guarded and I don't think that is very helpful. I've found that by sharing information and exchanging ideas you're much further ahead. And there's no reason not to share. Even when you're formulating ideas I think there's mutual respect for, that's your idea and you're developing it and there's been very little of the very competitive kind of thing.

DF: Because you're a bit more arms length from industry, what do you think of the attempts to go back into, like B.C. offshore and in to the far north with development, some of these riskier projects? Does an academic have anything to say about that?

EM: I'm not sure, you have to balance the environmental impacts I guess, for the need of the resources. I realize it's a very expensive proposition in both of those areas. So I'm not sure where the balance should lie in a sense. I know I'm sitting on the fence a bit on that one.

DF: But I mean, the Mackenzie Valley Pipeline Inquiry also put in the social and political land claims and so on. So there are many things to be juggled aren't there?

EM: I think the 10 year moratorium was probably a good thing. It's allowed people to think about the whole thing more carefully. And it's allowed the native people I think, to get their side together. And from the sound of things it looks like it's now going to go ahead. Certainly we're beginning to need that gas. It looks like, from the Alaska Pipeline and so on, that it's possible to put in pipelines with minimal environmental damage.

#380 DF: Although you did notice that somebody shot a hole in it the other week?

EM: Oh did they?

DF: A million litres of oil, a hunter shot the Alaska pipeline and a million litres of oil spilled.

EM: My gosh, I hadn't read that.

DF: It was on television, there was actually film footage of it squirting out. And in these days of terrorism and so on, the potential of something like that happening on a more massive scale exists.

EM: I hadn't realized that, no.

DF: Anything else you'd like to say about the CSPG?

EM: I think we've covered most aspects. I think the people that have been involved in the Society have certainly been a very dynamic group of people and I've made a lot of friends with some of them. And I've found it a rewarding and enriching experience to be involved with the Society in a variety of different ways. So I'm a strong supporter of the Society and I think they're doing, on the whole, a very good job of publicizing geology as a whole and encouraging, I think, good research.

DF: Super. Well, at that point then, on behalf of the Canadian Society of Petroleum Geologists and the Petroleum Industry Oral History Project, I'd like to thank you so much for allowing me to come into your home today and ask you some questions and get some of your wisdom from a wonderful, brilliant career and we'll end the formal part of the interview at this time. Thank you very much.

EM: My pleasure to be involved, thank you.