

PETROLEUM INDUSTRY ORAL HISTORY PROJECT
TRANSCRIPT

INTERVIEWEE: Oscar Erdman

INTERVIEWER: Betty Cooper

DATE: May 1982

BC: My name is Betty Cooper and I am interviewing Dr. Oscar Erdman, who lives at 4324 Coronation Dr. S.W. in Calgary. The date is May 18th, 1982. Dr. Erdman, what I'd like to start with is to get some background on your own family, so if you could tell me when you were born, where and where your parents came from.

OE: I'm called Oscar, to begin with Betty, by my friends, especially. You want to know when I was born and when, I was born May 5, 1915 at a little village in southern Alberta called Barons, it's still a little village. My parents moved to Barons from Peer, South Dakota in 1906. They came to Peer a year or two before from a place called Crimea, a group immigrated from Crimea to the United states because they heard about the opportunities in the new country. They were not Russians but Estonians and their parents had come from Estonia some time in the middle of the 19th century I suspect, I never did know the detailed story. My sister has done a lot of work on that and she knows a lot of it.

BC: So they had come from Estonia and migrated down to the Crimean?

OE: Across Europe, I suppose about the middle of the 19th century and one story I used to hear from my grandfather was that they would get the floggings from the German landlords I guess at that time, I may have the information wrong and the group left and traveled for months, some died and with cattle and horses and what not. But they settled in Crimea and had a very good life there. They remained Estonians in their religion, which is Lutheran and they had their own school. I think it was something like the Hutterites today, they had their own school and they had to go to the official schools so they learned Russian. The official language was Russian but their own language was Estonian. One little sideline story which I am reminded of now, with my father on the farm near Barons, and I remember, I was there at the time, he had a big farm and raised cattle and horses, and he would be selling cattle to cattle buyers. And these cattle buyers always came in two and they would speak a foreign language between themselves, but they didn't know my father understood them so they spoke Russian. I suspect they were Russian Jewish cattle buyers so he had a certain advantage he never told them. That's a little side story. Anyway they came, their background was agriculture and they had a beautiful home, I've seen the pictures of it, in the Crimea, orchards and fields and whatnot. And they came to South Dakota and one story I keep saying, it was too cold there so they came north to Canada. They came to Claresholm, which was the railroad and a group. . . I was wrong there, they left their families in South Dakota, near Peer South Dakota, where they farmed. Some had farms, others were just getting started. A lot of this is hearsay of course, I wouldn't know the detail. A group of them moved to Canada because they had

these invitations and advertisements by the CPR in 1906 I believe it was. They came to Claresholm and moved east with horses and wagons, a group of men this time and I think they had to go 15 or 20 miles, they found free land, the government gave each man a quarter section and they had to prove it up of course, so this group and some of them were related to the group of men that came, they went back and I don't know how much longer they brought their families over. That's detail that you probably don't want Betty but . . .

#060 BC: Oh no, I think that's very good Oscar. Where did you go to school?

OE: I went to school in the little village of Barons, which is 20 miles east of Claresholm, it's still a little village.

BC: How many were there in your family, how many brothers and sisters did you have?

OE: 3 brothers and 2 sisters, one sister had died when she was quite young.

BC: So you went to elementary and to high school in Barons?

OE: Both Betty. When we went to high school there was no grade 12 but it just started about the time I was in grade 12. So my older brother didn't have the advantage of going to grade 12 because they didn't give it in Barons when he went to school and by the time I reached there it was a new class given.

BC: Were you the youngest in the family or the youngest boy?

OE: No, second youngest boy.

BC: When you were finished with high school, did you go right on to university?

OE: No. I don't think you're old enough to hear about the Great Depression. Anyway, it went something like this, I don't know if I had any idea about going to university but after high school, I completed high school in 1932 I think it was, '31 or '32, it was starting the Depression. We had a pretty large farm, six sections of farmland, mixed farming too. And there was enough money to send my sister and one of my brothers to University of Edmonton. My sister went and did 2 or 3 years in Home Economics, she didn't finish. The rest of us worked at home, and after about 2 years working at home there was enough money that I could go for one year. They I stayed out two years, I stayed out four years all together and then continued from there on until I was finished.

#085 BC: You went for one year and then came back to the farm for four more years, is that what you mean?

OE: I'll try again and see if I can get it right. After grade 12 I stayed home on the farm and worked two years, then I went to one year at the University of Alberta in Edmonton and then they ran out of resources and came back and worked two years and then finished my Bachelors and Masters at the University of Alberta.

BC: What made you decide to go into geology because that is what you went into?

OE: I have never quite resolved that question and the best that I can do is I was always interested in archeology in a manner of speaking, we had arrowheads nearby and hammer heads and I guess that was related a little bit. We had a place called Scabby Butte nearby, it's like the Drumheller badlands and there were outcrops and dinosaur bones and I remember going there a few times when we were younger. But I don't think I had nay idea of going in for geology until about my second year at University of Alberta and I happened to take a course in geology, Geology 1. My intention was to take chemistry and the reason why, I had a good mark in chemistry, that's the only reason I knew. But after I

took one course in geology I figured that was for me and not chemistry and switched entirely over to geology. I had all the chemistry I ever needed by that time, I nearly graduated in chemistry. So I continued in geology and got my Masters from Edmonton.

#109 BC: The fact that you went on for your Masters would be quite something in those financial conditions at that time?

OE: By that time, this was 1939, I graduated before the war started, in fact I had enlisted before the war started because there were no jobs available and I learned that with a degree and if you're under 25 you can get into the military. I did, I registered for the Air Force. My friends said, if you haven't enough brains Oscar, to make a living any other way, go ahead and join the military. We had all taken OTC training at that time you know. They either convinced me not to go into the military or I really wasn't that interested. . . so there was no immediate war or anything so I canceled out my application and never did go back.

BC: And went then and took your Masters?

OE: Took my Masters and graduated in '41 and directly from there I went to Chicago with the approval of my draft board. You had to have approval from your draft board to go out of the country and the reason . . . I had to leave Canada. . I didn't want to leave Canada but the courses I wanted were Petroleum Geology and there were no courses anywhere in Canada at that time. Post graduate work of the type. . .sedimentary geology, post graduate work in structural geology. . .so I elected Chicago which had a good reputation, especially for Structural Geology and some for Petroleum Geology. So with the permission of the draft board I went there but I nearly got in the U.S. army. They gave me the medicals and notices came, you are now qualified to get in. The U.S. was not at war you know, Betty, at the time. It was a very awkward situation for foreigners because for some of the U.S. people, they said, we don't care if Britain loses or Germany wins, we don't care. They were very independent at that time. Some of my friends were, the country was not.

#141 BC: So you didn't actually get drafted into the American army though?

OE: No and I had apparently the privilege of saying no or forever waiving the privilege of becoming an American citizen in case I wanted to. And I didn't want to do that either. One day after all the medicals an important looking letter came and I opened it up and it said, report. I went to my professor and I said, what's all this. He was on the draft board in the same area which met the next evening. He said give me that letter and at that draft board meeting he said, Erdman is a visitor here and a student here and his draft board knows where he is and can call him anytime he wants and he's doing vital war work. What I was doing, I was helping a professor give courses in what is called photogrammetry, which is a war time type of course, and easy course, and the other one was chemical microscopy, which I didn't understand but these were extra courses which the professors in geology were giving towards the war effort at that time.

BC: They were for very specific people within the Armed Forces of the United States?

OE: I don't know where the people came from. In fact in this course, which is a special course in crystallography which might have had to do with of course, crystals for the various communications, I don't know what they're for but crystallography was a course that we'd been taught in Alberta and it's actually a geological course. I was helping the

professor as an assistant in crystallography course, which is called chemical microscopy and I found out one of the students was one of . . not my friend but one of the assistants that we had in the University of Alberta when I was in chemistry. He was older than I was and he was taking this related course, that was a war time course apparently.

#175 BC: What would they use that for, do you think in the war time?

OE: I don't know. This was a chemical, it was to do with crystallography under microscopes, growing crystals under a microscope and it was related to geology because we had to know crystallography related to rocks.

BC: So did you stay down in the United States until you got your Ph.D. then?

OE: I came back in the summers with the Geological Survey of Canada. I had been working with them in the summertime since 1941 as a summer student assistant. So that work continued in the summertime in the foothills and mountains of western Canada.

BC: Can we look at some of that. Your first summer, in 1941, where did you go and who did you work with?

OE: One year earlier, in 1940 was the first year I had experience in geology in field work. In 1940 it was not the Survey but it was the Research Council of Alberta. I think I told you before Betty that I had the opportunity of operating a self propelled combine in 1940 at my fathers farm. I had been doing that type of work before and the rate was \$10 a day and then I got this telegram from Dr. J. A. Allen at the University of Alberta, Edmonton, who offered me a job for a month on a Research Council Geological field surface party, west of Rocky Mountain House. The job was cook and packers helper and the pay was \$2.50 a day as I remember, it might have been \$2.85. I looked at the two jobs and I took the one as cook and packers helper and I didn't know anything about it and I have some pictures to show the type of thing we did, not where I was at but related to it. For one month, that was a geological survey party, 5 men and 15 horses I think.

#211 BC: Dr. Allen would be the . .

OE: He was the Party Chief and it was a geological survey up the North Saskatchewan River to its headwaters, from Nordegg.

BC: Who else was on the survey, do you remember, on that particular crew?

OE: Dr. Allen was the Party Chief and Mickey Crockford, who is now passed away, M. B. B. Crockford, he was the Assistant and he was a paleontologist. Jim Kidd, who has just retired from one of the oil companies was the packer, he's Fred Kidd's brother, the former MLA. Jim was raised in the Nordegg area where we were working and he had worked with horses all his life and he was a geology student also. So he was the packer and I was his assistant and the cook.

BC: Had you ever cooked.

OE: I had never cooked really before but I had to learn in a hurry. I was insulted a couple of times, Dr. Allen said, Oscar you better start baking bread in a Dutch oven in case we run out of store bread because we will run out of store bread, they called it. On a pack train you just carry so much fresh bread. I was rather insulted because the first batch I turned out they wouldn't eat. By the end of the month they were eating it because they had to, we had run out of store bread.

#236 BC: Did you pack along a cook book or how did you manage?

OE: We didn't need a cook book because we didn't have too many vittles to cook with. I should mention Doc Allen's son was also along. I think he wanted to have his young sone, Edward exposed to geology in case he got interested. I don't think he did get interested and he was always spilling the coffee and the soup and what have you. This was all done with campfires you know. Open fires with pots and kettles hanging on the tripods and the bar across the fire.

BC: Pretty primitive.

OE: And we moved every day. That made it difficult. A typical day, 5:00 in the morning, get the fire built and put on something and Jim Kidd would look for the horses and get them ready. I think we worked pretty hard because after the breakfast, which got edible later on, not the first week or two, then Dr. Allen and Mickey Crockford would say, goodbye and we'll meet you so and so, up the river, so many miles. We had to pack the camp all up and all the work to do, all the dirty work to do and get packed and move and set up a new camp and start the whole thing over again. So it was quite a bit of experience in moving anyway.

BC: Did you have an opportunity to do any geological work with Dr. Allen that year?

OE: That's a good question because I was taking geology, I had graduated in geology by that time, with a B.Sc. And we say a lot of rock and had the opportunity to talk with him in the evenings but not really to learn much geology because we were busy with horses and food and packing and setting up the camp and pulling down the camp, setting it up, every day for 30 days I guess.

#271 BC: Were they looking for petroleum deposits at all?

OE: Dr. Allen had a grant from the Geological Survey of America to do the geology along the North Saskatchewan River from Nordegg to the headwaters in British Columbia. Mickey Crockford was the paleontologist, so they were collecting rocks and samples, some went to the University of Alberta no doubt. There never was a report really written on that expedition except a summary was given at a Geological Survey of America meeting. He got the grant from the society and I had hoped that there would be a full report given, I never did see one but there was a paper given which I knew about but I never . . .

BC: But it wasn't really primarily concerned with petroleum?

OE: No, it would be probably the first local geology done on the North Saskatchewan River from the Nordegg area up to . . . I can't remember the name of the pass now but it's beyond the Banff-Jasper highway. It was . . . we camped one evening where the Banff-Jasper highway crosses the Saskatchewan River, there's a store there now. And forest fires were burning around and we still had about 2 days up the river to the pass from there. So they were doing the geology, the first geology I suspect that had been done on some parts of it at that time, 1940.

BC: You were on horse back mostly?

OE: Yes. We had enough horses to ride and enough to pack for a month.

#309 BC: Then you went back to school taking your Masters?

OE: Yes, I probably had one year of my Masters behind me at that time, yes, I finished in '41.

BC: And then, did you join the Geological Survey as a full time employee at that time or just as a summer employee in 1941.

OE: In the fall of '41 I went to Chicago so we had worked as a survey party in the summer of '41. Later that year, I guess we jumped a bit, that job lasted a month and I was coming back to run that combine I guess but I fortunately or unfortunately for me, one of the student assistants got appendicitis and I replaced him on a geological survey party, so I went from one job to another.

BC: Oh, whose party was that?

OE: That was Dr. B. R. MacKay's party.

BC: Where was it?

OE: It was in the same area, that's why I learned about it, in the Nordegg area. This was being mapped at this time and was mapped for several years afterwards, I've a geological map sheet every year, a sample of the type of work we did, I can show you a little later.

BC: And this was looking for petroleum?

OE: This was. . . I think primarily coal but it was mapping the country for everything. Coal was the big thing at that time, that was '40 and '41. We mapped coal deposits but we also mapped the structural geology and measured sections so that it would apply to petroleum exploration also.

#347 BC: In the area that you were mapping were there subsequent discoveries or drilling?

OE: Yes, there have been subsequent discoveries and quite a bit of drilling, quite a few dry holes too.

BC: What discoveries would there have been?

OE: You know, Betty, we mapped there and I was Party Chief for the last. . .1944 and 1945 and I suspect there are some recent wells in some of the areas that we mapped. There were some shows . . .there's one big discovery there when we mapped with Dr. MacKay, it was called the Stolberg area and we mapped and I've mapped since the Stolberg anticline. The year after. . .1947 and 1947, Shell and Imperial had drilled a well and got some gas but with gas prices very low they never really developed it but in the last few years there is quite a boom back to drilling again and the Stolberg area now is a field. That was the early mapping under Dr. MacKay, that Stolberg anticline.

BC: Do you think that the reason it took a long time before it was utilized or before further discoveries from the showing came was because perhaps they were drilling at the wrong level?

OE: They actually found gas but probably one of the reasons was there was very little seismic work done at that time to confirm the structure that the geologist would find. And number tow the price of gas was so low that at that depth, 10,000-12,000 feet it wasn't worthwhile to drill for the show that they were getting. And more information since then too, it all helps.

#388 BC: The improvements in the seismic equipment probably would help too?

OE: That was a great improvement.

BC: From there, from 1940, you went every summer then, right through until '46?

OE: 1940, and '41, in the same general area but different map sheets. Then 1942, in the middle of the war, great effort on gas, oil and coal in the Peace River area. Most of the survey parties were all transferred and the work was done in the Peace River area. Dr. Hugh Beach was my Party, Chief. I was a Senior Assistant in 1942.

BC: And what part of the Peace River area were you working in?

OE: That was a place called Hudson Hope, we were stationed at Hudson Hope and we often wondered what he was hoping for. It was a beautiful little village at that time. And we worked, I guess it was called reconnaissance mapping, we had horses again, it was all done by horses before the Beaver plane was used or the helicopter was used. We were out all summer mapping both north of the river and south of the Peace River. There were several parties, I was under one party, Dr. Spivac, whom I knew and was also at the University of Chicago, I met him there, he was heading another party in the same area for the Geological Survey of Canada. There were a great number of geologists and topographic people that summer working in that area.

#429 BC: Was this because they were hoping to find some oil for the war effort?

OE: That was related directly to the war effort as I understood it and gas, oil and coal.

BC: Was it related at all to the Americans and their work farther north and the Alaska Highway, any of that sort of involvement?

OE: They were all moving north when we were going there. As a matter of fact, there were troop trains going through Dawson Creek when we were stationed at Dawson Creek, trains loaded with soldiers going north at that time. And we were headed for the Peace River area. As I understood it was related to the war effort and the search for oil, gas and coal because the structures were there. No one had really done much drilling there but there were some beautiful looking structures that should have oil and gas. In the meantime they have found. . .

BC: Did you drill at all at that time?

OE: No, it was only surface geological surveys.

BC: In recalling and looking back Oscar, can you see areas that indeed have now become discoveries or is there anything that you can pinpoint to the work you did.

OE: We did a lot of work which is reconnaissance, which normally you measure sections, describe the rock and map it regionally. Later work would detail the structures that were mapped from the first mapping. We did a lot of moving around there also, and traveling around. Undoubtedly there are oil and gas wells in British Columbia where we surveyed. That's 40 years ago now, I never thought of it, it seems like about 20 to me.

#475 BC: And Dr. Beach was with you, can you recall any particular incidents with Dr. Beach that are interesting, any anecdotes of your time when you were working with him?

OE: Do you know Dr. Beach, Hugh Beach.

BC: No, I don't.

OE: He was born and raised in Gleichen and a bit of a genius. He passed away a few years ago. At the time of his retirement and passing, before that he had been with Texaco.

End of tape.

Tape 1 Side 2

OE: [in mid sentence] . . .developing pieces for magicians. There would be magicians come to Edmonton and he would have a skit for them and he told us what these skits were, they were quite innovative. They'd say, okay son, how much money do you need, he'd say \$5 so he got \$5 for a skit that . . .

BC: A magical trick.

OE: Yes. One was shooting a plate in the back velvet and all of a sudden the magician would pick up a gun and shoot it in the corner and the plate would fall out. And then he would pick up this corner and he'd bring it back and he'd throw it there and the plate would become whole again. So he told us how he did it. . the eye is quicker than the whatever . .

BC: How did he do it, do you remember?

OE: Yes I do. The plate with a little corner of black velvet around it on one corner of it that you could drop after you shot the gun off, with strings and that, a lot of noise and smoke, you just drop it and there was a corner missing. Then he'd bring the corner of the plate, the broken piece of china, pick it up from there and bring it back and he said, I'll fix that plate up again, he'd throw the corner of the plate and he'd pull another string and he'd pull the black velvet off there and the plate was never touched to begin with, things like that. I think one day he also made a play and sold a play for some skit or something like that.

#021 BC: So he was a genius, he had many talents.

OE: But geologically, he was an excellent geologist.

BC: looking at his work as a geologist, are there any particular things that you can think of about Dr. Beach where he contributed to the geological knowledge, Canadian geological knowledge or discoveries of. . . ?

OE: Yes. I met him. . I entered the service of the Survey after I left Chicago in 1943 and he was there at that time. He was one of the group that left the Survey when they oil industry began to develop in western Canada. He came to Calgary from Ottawa in 1945 and joined the services of Texaco Exploration. In the early days, 1947 was when the first reef discoveries were made in Leduc, and I don't know when Texaco picked up their acreage in the same area abut it was Dr. Beach that has been given the credit for the early large discoveries which are still productive, of the reef discoveries in the early years of reef exploration. Bonnie Glen, Wizard Lake and 2 or 3 others that were found shortly after Leduc and Redwater, Texaco was right in there and he was their Exploration Manager at that time and I think that industry will have recognized that he had a pretty big part to play in that.

BC: You mentioned that in 1943 you joined the Survey, this was as a full-time employee then?

OE: In '43 then I joined as a full time employee.

BC: Did you have your Ph.D. by that point?

OE: Not really, I had all the groundwork done, Betty for the Ph.D. but then it wasn't until 1946 when I got the thesis dissertation written and accepted. But I entered the service of the Survey in 1943 as a war time technologist, that was the title we were given. It was supposed to be war work looking for gas, oil prospects in western Canada. Every summer we went out west. By this time I was Party Chief of my own surface party.

#053 BC: Yes. So that would be '43, you came out with your own party?

OE: It was no, I think a little later on. I think it was by '44 and '45 it was my own party.

BC: You were with Dr. beach for two years then?

OE: Dr. Beach in '42 and then in '43, the Party Chief was another Texaco geologist with Dr. Beach after that, Gordon Crombie, who has now passed away in the last year. He was with the Survey at that time, he was a senior man. The two of us were fairly equivalent in our backgrounds. In 1943, back in the area west of Rocky Mountain House again, another map sheet they call them. I don't remember the names of them, they were Saunders and Alexo map sheets that Dr. Crombie and I were involved in. And he and I were together all summer, then he left the Survey and then in 1944 I was Party Chief and we finished that Alexo, Saunders area which he and I started. The following year, 1945 I was Party Chief in another area, called Cripple Creek, farther removed. The same area but getting quite mountainous and beautiful country, up the North Saskatchewan River, reef country actually now.

BC: They work that you did there, west of Rocky Mountain House, how valuable was it to you and to others in the years following as the search for oil and gas became much more intensified?

OE: Betty, we were so ignorant at that time, that we found and undoubtedly saw what now is very common, Devonian reef, you hear the words Devonian reef and reef prospects and reef production. We were actually mapping the fringes of it and didn't recognize it as a reef, we just recognized the rock and displayed the rock. People have gone in the same area since then and said, oh, you were mapping this Hummingbird Reef and we were. It's an outcrop area actually, you won't find oil in that outcrop but companies every summer now have been taking their students and their geologists to areas such as the Hummingbird Reef so that they can recognize what reef rock looks like. Under the ground at Redwater and Leduc you only see a core of it at best. There's a whole mountain of it, with porosity and fossils forms and various rock types that occur under the ground but there you see it in three dimensions. So it's quite an advantage to see it in three dimensions and it helps you interpret what you see in the single holes drilled a quarter mile apart.

#095 BC: What did you think it was at the time you were looking at it?

OE: Frankly we described the reef fossils that are now recognized as related to reef, we described them, we described the porosity and they're in the government books in Ottawa and we just called it a change in lithology, which meant that the rock changed from one type to the other type, which it does. But a reef is no more than that, except it changes abruptly.

BC: But the Devonian is now, in fact there was a conference here a few years ago, just devoted to the Devonian.

OE: Yes, there have been more than one I think.

BC: Because this is where so much of the oil has been found?

OE: I think it's at one time, 70% of Alberta's gas and oil is related to the Devonian reefs and formations.

BC: So this would have helped you and others?

OE: I think it helps when I'm looking at a core sample and I think about what it looks like in

three dimensions. I'm sorry that surface type of geological work is less important now, or less available anyway.

BC: Why is that?

OE: I think the earlier geologists had the advantage of seeing the rock in three dimensions. I recall when I came to the oil company in Calgary in 1946 that most of the work was done with microscopes looking at samples of rocks and then putting it on maps and sort of drawing straight lines. So if you had a three dimensional background in the Rockies and saw the rock it meant more to you than if you had never been in a surface party and were just joining formation tops. I often wonder what some of the geologists think when they study wells as opposed to those who have had many years of surface geological background because our backgrounds are so different. There's a surface geological background, you'd see what happened to the rock as you went along strike and across strike. However that's unfair because there are many geological surface parties that go out still and weekend trips to the mountains so they do see it in three dimensions also.

#129 BC: Why do you think the major reason was for the shift from the surface geologist to the one that was really looking just at the core samples?

OE: I'll put it a little different way. The only samples there were to look at when we were doing the work were in the mountains. There were very few drilled holes in the plains in Alberta or Saskatchewan. Two of us studied all the wells in Saskatchewan in one month when I came out west. There were only about 14 of the deep holes, all drilled by Imperial.

BC: Why was your partner?

OE: John Wantford??? at that time, with Gulf. The two of us were the first to. . .and Stan Pearson was the third but he elected to go the geophysical route so John Wantford and myself were the. . . and Jim Bryant were the first three geologists with Gulf. . .we're jumping a bit now. But we were able to do all the geology of Saskatchewan, that is sub-surface geology, in a few months because there were so few wells at that time.

BC: Is it because more and more wells have been drilled so now there is data for the geologist that he doesn't have to tramp around or doesn't feel he has to.

OE: That's exactly right. There are so many wells, no one person can keep up. Several thousand a year.

BC: Are there many people that do . . . are there any people that study surface geology today?

OE: Yes, there are. I had been to a conference just in the last month or two, there were several discussions on surface outcrops, on reefs again, more detailed studies of reefs given by Calgary geologists. And companies still send their people out but especially the Survey, the government Survey sends their parties out, but farther afield though, where the rocks have not been studied. Most of the rocks here have been studied and there is a lot of work that can yet be done and is being done by geologists, more detail mainly, or farther afield in the parks or a combination.

#160 BC: The opportunity for young geologists to work for the Geological Survey must have been much appreciated by you.

OE: In many ways it was a job and jobs were difficult to get but they could always use students assistants. By the way I was wrong when I mentioned earlier that I got \$2.50 as a cook, I got \$3.00 as a cook and when I went to geological surveying my rate dropped

down to \$2.50 and then worked up to \$2.85 again. So a cook paid better. .

BC: But did you find that having this opportunity to work at the work that you were going to do eventually was a big advantage to you?

OE: Oh yes, I'm sure it was. Whether it was an advantage or not it must have been good experience because you see so much of the geological story when you spend a summer on foot and on horseback, just a lot of walking and climbing. The new method is much faster and much more efficient, you drop a person with a helicopter so he sees the same amount of rock and a lot more in the time but I guess we just saw more detail because we just didn't move as fast as they do nowadays.

BC: You were the Party Chief in '44, '45, who worked with you, do you remember any of your assistants and are they still in the oil patch?

OE: I remember assistants and some of them undoubtedly, in fact I had a card from one that he got out of geology entirely and I don't recall his name, that was a long time ago. There was another one that is still in the geological discipline is Jack Currie, who was my junior assistant in 1944 and senior assistant in 1945. He is and has been for some years, the Structural Geology Professor at the University of Toronto, Dr. J. B. Currie. He had done, because he had been in western Canada, I think largely and saw the rocks and the mountains and loved them I think, that probably settled his and determined his career for him. I have followed his career because in '46 when I joined Gulf Oil I had known him for two years, and he had continued on and got his Ph.D. in geology then he entered the services of Gulf Corporation in Pittsburgh as a Research Scientist in structural geology. So on trips to the research facilities at Pittsburgh, I used to meet up with him again. Then after several years, Dr. Currie came to Toronto, he was raised in Ontario, came back to Canada and has been at the University of Toronto ever since. And still does valuable work out on the rocks which he started with many, many years ago.

#216 BC: He still comes out here in summers?

OE: He has. He's had some difficulty, health problems, so he doesn't come as often but he's done research for various companies.

BC: Can you think of any of the other people who worked with you as assistants during your time with the Survey that are still with the oil patch?

OE: One of the others was Austin Cliskey??? and he has retired I believe, I'm not even sure where he is now, from Chevron. He's been with Chevron many years and he was with me one year. Spencer Klaus was one that has since died unfortunately.

BC: You mentioned Stan Pearson awhile ago, he was with the Survey at one time, did you work together?

OE: We never worked together. Stan Pearson and myself never worked together at the Survey. But of course, Betty you know that he came to Gulf right directly after World War II and was the first geologist hired by Gulf, I was the second I suppose. He came in 1945 I think and I came in 1946 to Gulf Canada.

BC: It was a pretty small firm at that time if you were the second geologist?

OE: It was called Canadian Gulf Oil Company and it was one or two offices.

BC: Where were they?

OE: On the 5th floor of the Lancaster Building if I remember right, and we used to walk up to them instead of taking the elevator. Something like that. There were about 5 or 6 of us at

the beginning.

#243 BC: Who else was with you at the beginning?

OE: John Bevel was the Manager. He's since passed away. Mr. Brockway was the geophysicist.

BC: What was his first name?

OE: We called him Brock and it was L.I. Brockway but I don't remember what his real name was, it was an unusual name, I think it was L.I. Brockway, I may be wrong even on the initials. And of course, Stan Pearson. Jim Bryant, who is still in the oil business, he was one of the early geologists with Gulf. And John Wantford, I guess we were the original four. Stan Pearson, myself, John Wantford and Jim Bryant, pretty well in that order too, in the first two years of Gulf activity. That's 1945 - 1947, taking that period in.

BC: If we can look at that period, 1945-1947. What do you remember about John Bevel for example, did you work very closely with him?

OE: Well, with a small office you couldn't help it. He was a very clever man and unfortunately could have been one of the principles of Gulf many years ago but he ran into difficulties.

BC: What about Mr. Brockway?

OE: He was the first actual. . .these were all U.S. people from the States and he was the first geophysicist as I recall, Stan Pearson could give you a better story on these people because he went into the geophysical group there. But Brock was the first geophysicist and did the early geophysics and organized the early field work in Alberta for Gulf.

#279 BC: And where was the early work that you were doing?

OE: Before I came actually. . . and I didn't mention. . I should have mentioned our Exploration Manager, who hired me, was R.P. Lockwood, Bob Lockwood. I don't know why I forgot him. He was the first geologist who came here as Exploration Manager and he hired Stan Pearson and he hired myself. He came from the States, transferred from Gulf operations to here. So he was the one that set up the office for the Exploration Department of Gulf Canada.

BC: And where were you working, what part of the country?

OE: In his early work he must have been . . .in fact he was the one that came to Ottawa to interview me in 1946 or '45. His work in Canada started before that, in 1943 I think, along with another famous geologist, Dr. Max. Littlefield, who was never stationed in Canada but made trips, a month or two or three at a time. Littlefield and Lockwood then were the early, early geologists from the States. There were others that came with them too. But Max Littlefield and Bob Lockwood are the ones that are responsible for many of the later discoveries that Gulf made here undoubtedly, because they had the experience in oil and gas, which none of us Canadians had. Coming from an operation where the rock was not too different and had the background of the Gulf expertise.

#315 BC: Were they working in central or southern or in the foothills or. . .?

OE: When they started. . I'm told, that's before my time. . . in 1943 I think it was, I guess Brockway might have been here about that time, they did some gravity work across Turner Valley, early old gravity work. Which is a Gulf invention by the way, Gulf

Research, Pittsburgh invention. Anyway the refining of it was. They found enough interest from that tool, Pincher Creek and Turner Valley that they carried out that gravity expression for many years afterward. And then seismic the same, they did the early, early work in a certain technique in seismic, called refraction surveys that were also pretty well, wither invented by Gulf or gulf specialized in it anyway. And that helped find the Pincher Creek field.

BC: So they were working in Pincher Creek area when you came to work for them?

OE: They were already working in the Pincher Creek area. They had done some work before that, Gulf had done some work in turner Valley, they moved to the Pincher Creek area and actually north of Pincher Creek but the sediments seemed to be too deep there, so they moved the seismic crew to the Pincher Creek area, did some seismic surveys across what is now the Pincher Creek field. In '47, I think it was they drilled a well and the first well was a discovery, Pincher Creek #1.

BC: At the time they would have been doing their gravity survey would it be, down there?

OE: Yes, the early work was gravity survey.

BC: Because of the just emergence of the geology part as far as the defining of the various reef, was there any problem from the geologist point of view of working down in the Pincher area, of knowing, you know, what is Devonian and what is Mississippian?

OE: Yes there was. Undoubtedly their outcrops are no that far west but it's a highly faulted area and the interpretation must have been a real problem at the beginning in Pincher Creek, the seismic interpretation. The surface geological work had been done by the survey people, in the various companies, Con Hague, whom you know, had worked down there. Stan Pearson had worked in that area as a student also, so surface interpretation was fine but what's at depth 2 miles and a half, where the field is, 12,000', was a different problem, a bigger problem. I recall seeing some of the seismic interpretations, this is later now, several years, I was with Gulf at that time, but the early interpretation was really difficult because there was a structure there in Pincher Creek and whether it was an anticline, which is a turnover, like an inverted canoe. That was one interpretation in the early days and the other one was, no, it's not an anticline, it's a broken off faulted structure, that's broken off from the main sheet of. . . I'm talking about the Mississippian carbonate limestone rocks and thrust higher up. On a seismic interpretation no one could really tell at that time, it could be interpreted either way. And I do recall that the U.S. geologists that were in Harrington, Washington, before the pipeline discussions, they considered it to be an anticline. Since then, it's probably a combination of both. So there were problems in interpretation and there still are, it's very difficult, it's 2 ½ miles down.

#402 BC: Is this why the field turned out to be not as large as they had hoped?

OE: Not really. The reason originally that they expected it to be 7 miles long and 3 trillion is because two wells drilled 7 miles apart both got gas and both seemed to fit the structural picture fine. What was not appreciated fully and a real worry in any place where you have carbonate rocks, they are very erratic and the porosity which you must have, porosity and permeability did now carry through from one extent of the field to the other as much as expected. Sandstone fields tend to be more reliable that way in terms of porosity maintained throughout the field. But carbonate fields they come and go and one well is good and . . .

- BC: So in the middle there was nothing there?
- OE: Well, there was some there but not as much as we thought, probably a third as much as we thought, something like that.
- BC: So this really needed a great deal of rethinking on the part of Gulf as to how to exploit that area?
- OE: At that time it looked easy. The structure was there and they were structurally correct in their interpretation and they would drill a well. . . In fact, we drilled a well which I sat on, which I was the well site geologist on, the second well called the Red Shrimp. And it was drilled on purpose on the west flank to see how far you could go down dip. So this structural interpretation was pretty fair but the porosity and permeability were the problems in the limestone carbonate field.

End of tape.

Tape 2 Side 1

- BC: Oscar, could we talk about the pack train and about the tents. The equipment that was used at that time with the Geological Survey and again as you went into doing the same sort of thing only for Gulf this time?
- OE: Betty, in those days, before the day of the helicopter and the Beaver plane, where the pre-Cambrian geologist slugged it out on foot in the muskeg and would work with canoes, we worked with a string of horses, pack horses, up to 20-22 horses, 5 men. There would be the packer who would be in charge of the horses and probably a packer's assistant. . .
- BC: Why would you need an assistant?
- OE: Because 20 horses take so long to. . . sometimes the horses are lost, to take care of the horses. And a cook, generally a man cook, during the war years we did have a man, wife team in one area which wasn't too remote, but generally a man cook. And the Party Chief geologist with 2 or 3 student assistant geologists, second or third year students. That would be a typical summer survey organization. You lived in. . .
- BC: When you went with Gulf though, you went with two of you as geologists, right?
- OE: Yes. With Gulf in 1946, two geologists, packer, packer's helper and a cook and a guide from that part of the country. But again, tents, the cook tent, and dining tent, generally joined by a ridge pole, so it would be one long tent, with two tents joined, long ridge pole and flaps open between them. And the sleeping tents.
- #027 BC: These wouldn't be tents like you would see in 1982 though, that you can kind of open like an umbrella almost.
- OE: No these were rectangular tents, the old army type of tent I suppose you would call them, canvas tents, with flaps on to keep them cooler in the daytime or, generally to keep them rainproof. And Betty I think I told you that with the horses you camped where the horses could go not where you wanted to go. So you camped in the river valleys where there was grass, even if it was farther from your work. I recall one time where every morning we

walked across the river to our work, kept our shoes off so we wouldn't have wet feet all day. It would be a small river, a creek. And the horses would generally be arranged so that there were enough horses for each man to have a horse, a riding horse, enough to carry in up to a month of food and it's said that one pack horse with two packsacks, could carry one man, one month of food, as I remember it. So one of the items that we always remembered, I made the mistake once, you go after your groceries long before you run out because the man's not back for two weeks. And we made the mistake once, we ate porcupine once, those that wanted to eat porcupine. That was the typical arrangement, so the tents were set up near some creek or river. You set out on foot to your work every day with the Geological Survey and with gulf the same way. And with detailed survey, which we did for the Geological Survey of Canada we would move tent and equipment probably once every ten days. You would tend to work an area a radius of five miles or so from your headquarters.

#057 BC: Was it rather like the petals of a flower, you would go around and come in and then do around again and come in?

OE: Or squared off somehow. Something like that and then you would move 8 or 10 miles to the next camp and stay there until you finished another area there. So that's for detailed geological surveys, I've been on surveys where we moved daily and that was a real chore. The one with Gulf in the Wapiti River area, we called it detailed reconnaissance and we moved quite regularly there. Normally what was expected was the hired men that you got would do all the moving and the rough work and the geologists would do the geology, but more than once you were involved with the packing and helping and you always took your own tents down and packed everything.

BC: You didn't use surveyors at all?

OE: With the Geological survey of Canada, the areas where I had worked Betty, we would normally have maps that the Topographic survey had surveyed and published a short time before. Sometimes in some of the areas, west of Rocky Mountain House, the blazes were still in the tress with their number, so it was very handy, we had their manuscript maps, we knew where we were located by checking on the blazes. About the same time the aerial survey maps were becoming available, not the vertical ones as much as the horizontal type of maps but later on the vertical maps were used also which were very handy. You would plot and recognize your location right on the vertical map, punch a hole with a needle and put your number on the back of your survey station. So that speeded up things a lot. The first years with Dr. MacKay, we carried heavy survey equipment with us, plane tables and allodades??? and rods. Have you ever seen anyone get on horseback with a rod, on a bawky horse, you don't always get away with it.

#087 BC: No. Rather like being at the tilts at the tournaments in King Arthur's day.

OE: Something like that. But the student assistants, they evolved some interesting techniques. I felt a little awkward about one of them they developed, this geological survey Party Chief, Dr. MacKay wanted everything mapped accurately with plane table, rod and allodade. So we'd start off in the morning with plane table, rod and allodade and I noticed that the senior men in this survey would stop a mile or two up and drop the plane table, rod and allodade and say that's what they were using. That has been known to be done

and I don't know how we. . . I think we paced our locations in. It was very slow work if you had to survey, you'd never get done. But aerial survey, the vertical ones, they speeded the work up a lot.

BC: With moving to a private company, was there any difference in the way the work. . the kind of work you did from when you had been with the Survey that first year?

OE: The first year, which was say, 5 months out in the field, the field season with a private company was a couple of months longer and we covered much more ground. We didn't do it in the same detail as the government. For the government I think, one of the lessons we either learned there or were told or a combination was, when you were in an area, a map area it was called, treat it like you'll never see it again. In other words, I forgot something, I'll go back and look at it. At least look at all the information, whether you interpret it correctly or not. With Gulf Canada the area was a much larger area, it was 2,500 square miles as I recall, that Stan Pearson and I did in five months, with a pack string. The type of survey was different in that we didn't call it geological detailed survey, we tended to use the term detailed reconnaissance, which meant to us that we would do the surveys for the rock outcrop but that's normally along the ridges and along creek valleys. . .we would do that in detail and then we'd skip over to another one and not do the intervening areas in as much detail as I had done with the Geological Survey of Canada. And we didn't collect fossils like the Geological Survey of Canada expected and required because that was a fairly important part of the Geological Survey of Canada work in new areas.

#124 BC: With Gulf, at that time, this was the Canadian Gulf but the people had come up from the States, many of them to start it off, right?

OE: Yes, the supervisors and our Exploration Manager, Bob Lockwood was an oil man, geologist from the States, and was experienced in various parts of the United States. The Canadians at that time had very little background in. . . a few of them did, Dr. Link was here at that time and Jack Webb and Joe Irwin, and Doc Patterson???, they were senior Canadian oil, gas geologists that had experience but most of them had very little or none. So the companies would send the qualified Exploration Managers and Managers and Geophysicists up to train the Canadians.

BC: How long did this sort of thing go on, for instance, with Gulf Oil, with having them come up and go back again or come up and train or did you end up going down there too?

OE: Their system of having their men up here as managers continued less and less as years go by and as you know now, I don't know if Gulf has any. . . they have no U.S. counterparts or managers here now. Even ten years after we were with them, they only had one or two or three senior positions and as they were qualified the Canadians filled them. Stan Pearson became Exploration Manager after Bob Lockwood. Normally it went to all Canadian not too long after but the strange things when I'm talking about this, Betty, was that not too many years ago at a university meeting at Queens in eastern Canada, those people at Queens, students and professors, still thought that the U.S. named companies, that started in the States, were being operated and peopled by U.S. staff largely. By that time we had gone Canadian except for one or two managers.

BC: This has been one of the problems of the oil industry I think, because of those early days, that people have continued to have that. . .

OE: Misconceptions. I think it's all pretty well passed now but it was true up till 5 or 10 years ago, some people still thought that it was largely staffed by U.S. . . . Our neighbours are U.S. trained but they're all Canadian citizens now.

#166 BC: Many Americans took out their Canadian citizenship did they not?

OE: Took out their citizenship and they've been the pillars of society, church and some of them wanted to become involved in civic politics and couldn't until they did take out their citizenship papers.

BC: Was there ever a problem in your years in the industry where there was sort of the foreign worker as against the Canadian and the foreign worker getting. . . did you ever see any of that sort of preference to the person coming in from the outside?

OE: I was told that there were companies that. . . not nearly came to blows, but they were very unhappy because they knew that the same job that was being executed by a U.S. geologist was being paid at a greater rate than the same job by a Canadian geologist, some companies. I don't think Gulf ran too much into that situation although I had heard that there was occasion, at least one occasion where the manager was being paid less than someone he managed that was from the States. But you can't correct these things overnight, it was one of these situations apparently.

BC: In your time with Gulf. . . you were Chief Geologist when you were hired, did you come in as the Chief?

OE: I'll have to look at my record now. When I came, I came as a geologist. And in those days promotions came rather rapidly when there are only 1 or 2 or 3 people in the company. In four years after I arrived I see that I was promoted to Chief Geologist.

BC: When you came Stan Pearson was already there but he went off into the geophysical side of things.

OE: He went into the geophysical side of it. He had a geological background and he elected the geophysical opportunities and disciplines of that side and I stayed in the geological side. I don't remember the time but when I was Chief Geologist he might have been Manager of Geophysics, if there was . . . I shouldn't guess. But later on he was Exploration Manager when I was Chief Geologist.

#208 BC: One of the things with Gulf Oil is that, as with many other companies, is there was a continual acquisition of other companies. At one point you were Gulf but then you became BA.

OE: I recall that. I recall two things, the common expression Betty, I don't know if you've heard it or not, it's a lovely example of a fish swallowing a whale because Gulf was spending 90% of the money, had 90% of the staff, BA was a small refining company and had 10% of the staff and whatnot and when they integrated, we took on the name of the little company. There apparently were problems because BA did have geologists, they were doing exploration work and had been doing it. As Chief Geologist I met their geologists and interviewed them, some I never met, they didn't stay long enough, some resigned, they felt there was more opportunity elsewhere because Canadian Gulf had a staff at that time already. Others stayed and they've competed and did very well also there. So I don't know, I suspect that the company that is the larger company has certain advantages with the personnel that the other companies felt they did not have and. . .

BC: Did you find it difficult being called BA when you were the bigger. . . did you or other people, was there a resentment of, why don't you keep being called Gulf?

OE: There probably was more of a resentment with the U.S. management that we had, because BA was actually a Canadian name and the U.S. management had been brought up under the Gulf symbol all their lives. I never heard it from them but I suspect it would have been there. I recall though Stan Pearson was opposed to the name British American and said so openly because British did nothing for the French Canadian, and American did nothing for Canada. So he said, why don't you just call it Gulf, it could be the Gulf of St. Lawrence.

#251 BC: Well, eventually it did become Gulf, how many years after, do you remember and why they went back to the Gulf name?

OE: It was about 1960 when we became BA, my dates escape me now and I don't recall when we came back.

BC: And another company, was it Royalite that became part of the Gulf. . .?

OE: Yes. And I don't recall the year there either.

BC: No, but you recall the situation of them being. . .

OE: Yes, we integrated with Royalite and got their exploration staff, as far as I was concerned, we absorbed some of their exploration staff and others went in the other departments. Gordon Connell from Royalite, he just retired lately.

BC: Right. Did you find this difficult from the exploration point of view when you had to absorb people from other areas?

OE: It did create some problems I suspect and I felt. You always felt that the people that came in from the smaller companies felt that they probably were discriminated. . . [tape was sticking and dragging right here, just seemed to need to fast forward over a few words, about one number space???

BC: What about yourself in bringing them in, did you have problems because of there's a different way of training them or this sort of thing?

OE: I don't recall. We seemed to give them all equal opportunity and I don't even recall which people came from Royalite or BA. Jim Milne was a well thought of geologist, he's retired from Gulf but when I think back, he came from BA. And I didn't remember for the time being whether he started with Gulf or not. Hyles??? came from Royalite, he's now with the government and I don't recall very many others that stayed. They didn't have too big a staff actually so it didn't cause any problems.

#286 BC: Really didn't cause any problems to you. What were they advantages of the amalgamations?

OE: It brought in different experiences from different areas certainly, because they had different backgrounds than we did. Royalite had been working in other areas and BA had been working in other areas.

BC: Did it bring land acquisitions that you wanted?

OE: That was the . . . I really think, Betty, that from an exploration point of view, it may not have been too significant. I suspect and did at that time too, it was mainly a marketing type of thing. BA had the stations, Royalite had the stations and Gulf was getting into them.

BC: Gulf had very little in marketing.

OE: They had no marketing at that time.

BC: You were strictly exploration when you went in? Before Leduc you were working in the northeastern part of B.C., and down in Pincher. When Leduc came in, how was Gulf situated as far as land around Leduc?

OE: Some of the details certainly escape me now, but we did have in Gulf, a very good land position through Bob Lockwood. In the northeast of Calgary up to and including the Edmonton area, through the Canadian Pacific. I don't recall if it was 1 or 2 million acres of land, it was a huge amount of land.

#320 BC: How did he manage to get hold of all that?

OE: It was recommended to management and they were able to. . .CPR at that time was not in the oil and gas business and it's called a farmout or farm in. I don't recall the terms but I know that the rentals were even very reasonable, a few cents an acre, was it 10 cents an acre. All the land the CPR had in a certain area, certainly over a million acres as I recall was being explored by Gulf and CPR had benefits from it also. But the rentals were very little. Then when we began to hear, and I don't recall the year when CPR set up it's own department, we're going to take it back, Stettler and Big Valley had been discovered by this time. As you know, CPR is now Pan-Canadian, they took it all back but our management gave us instructions and I recall the wording, we just want to give only the bare bones back. So that caused a lot of real exhaustive, heavy exploration work and drilling to see that we only gave the bare bones back and I think that Gulf got a pretty good deal out of it. CPR certainly has a lot of good land that Gulf lost.

BC: You'd have to then. . you'd have to work very quickly with your seismic crews, do you remember what year that was?

OE: No, I don't, I don't recall the year.

BC: Because Gulf had its own seismic crews, this was unusual too. Was that part of. . . it was quite different than many companies who hired crews.

OE: the major companies all had some of their own crews, to monitor I think, the work and to learn from the experience of others. Gulf had some crews and they also had contract crews. At one time I suspect, I think we had Harry Carlyle and Stan Pearson could tell you the details but I think it was 12 crews at one time, there might have been 6 that were Gulf. I'm just going by guess because that was not my specialty.

#365 BC: No. Your specialty of course, was looking after all the geologists that you had. And did you find. . .like today, they have a lot of people who are consulting geologists. At that time there were very few consulting geologists and you had a lot of geologists who were employed out on the field as well sitters?

OE: I prefer the term well site geologists. It sounds a little more formal anyway. And you are right Betty, that seemed to work fine when everyone was learning but after you've been doing well site geology for 3,4, 5 years you are repeating yourself. Gulf got into a situation as I suppose other companies, where, we had been doing all our well site geology with company personnel. And as you hired every year it wasn't too difficult, you'd sent the newer people out, they'd get the experience that they should have. I still believe every new geologist should have adequate well site training so that he can handle

properly a well anywhere. I'm afraid they're not all getting that experience now. They know what's going on but they are not responsible, they aren't given the responsibility, pardon me. And we were all trained that we were given the responsibility and were trained by people like Bob Lockwood and Doc Littlefield. So we had training from people that knew and we tried to pass the training on. And now the courses are given in that too. But there came a time, I recall, probably not the first occasion, where they men began to object, they were married, their lawns had to be cut in the summer, the snow shoveled in the wintertime and they were out on wells. Most of the time you were picking your nose, you're waiting for something to happen, you're not really working that hard but you've got to be there. The geologist is responsible, in my mind, for the safety of the crew even because they know when there is porous sand expected below or a coal seam or a salt that might fool people, they might think something has happened when the dip drops 10', it could be a reef or salt, salt is very soft rock. So problems developed about that time and Gulf began to, very slowly and conservatively, use consultants. In fact, I recall when management in Toronto finally agreed. We'd been doing it, by the way, quietly, agreed, okay, but not on certain wells. From our point of view, we felt, some of us, that what they said, not to put consultants on certain wells, we felt that was a good practice because the consultant has to be honest where a Gulf geologist may quit the next day and you never know how long he's going to be working for the company. So we didn't see that that should apply but now it's I think. . . from what I learn that they're giving new geologist training on wells now in companies but I think many of the companies have gone to consultants. Some companies like Shell have told me that they don't put geologists on wells and never really have for many years, they just. . . .

BC: They do have a geologist there though?

OE: They have a technician of some type.

End of tape

Tape 2 Side 2

OE: [in mid sentence]. . . they were still mining coal. The first year we went there was 1944 with Gordon Crombie as Party Chief. We were working the area, but we didn't complete the survey and we were running into real problems in a place called Davey Creek???, I'm trying to find it on a map, it's been so long since I've been there. The problem was that the structure made no sense to us based on our background. Since then it. . . .

BC: Why did it make no sense?

OE: Well, I remember sitting with Gordon Crombie and staring at the rocks. At that time, the name reef was not recognized. If we would have known the possibility of reef we probably would have called it reef interpretation but we just said there's an abrupt change in rock type. It's either an unusual fault or an abrupt change in rock type. It came up since that what we were looking at was the type of structure known as folded fault. These were fairly new, they had been mapped before but really never accepted by everybody. So we never did interpret the structure properly until the following summer I believe. In the

meantime the Party Chief, Gordon Crombie, who had been in that area in 1944 had retired from the Survey but he wrote me a letter the following year, knowing that I was going back to do the next Alexo sheet and said Oscar, you should go back and look at that again and we may have some more ideas on it. So this is the story I told you, Betty, where Jack Curry, my assistant, and myself took off on a long, long day, 16 miles and I've forgotten how many mountain passes we went over, got back at 10:00 at night and. . .

#031 BC: You really went right off your map didn't you.

OE: We went off the map, we were no longer in the map area. We were working on another sheet entirely, we were at Cripple Creek actually, so we were over here, we were working over here that year. To finish the little side story, at 10:00 at night we were eating when we got back into camp, they were worried about us and I asked him a question and he never answered and he had disappeared from the dining tent table. He had fainted, I guess from exposure and strain and stress and what not. Anyway we laugh about that now.

BC: The other map that you have here which shows some different structure that you were looking at. This is the one in Alexo, where again you had a lot of. . . in the second strata there, yes, right in there. . . a lot of problems with trying to understand what the underpinnings were.

OE: Yes. That was where actually the folded fault theme applied and now it's recognized as quite common. At that time it was fairly new, in fact, we did work it out finally and part of my dissertation was based on that. I recall, after coming to Calgary, one of the oil company geologists, from England, working with British Petroleum, I didn't know him, he came up to me, practically followed me, and he said, I went over your map area Mr. Redman and I don't agree with your interpretation. I said, fine, the first one that goes in only goes so far, you have something to start on. He was referring to my interpretation, finally we left it at that and he went back to his work and I forgot about it and he came back and said, well, maybe it wasn't so bad after all. I don't know what it means but I wouldn't have been blaming myself if I had been wrong because we were the first ones in there actually.

#060 BC: When did they first start to recognize reef as reef then, who did this?

OE: Well, this was not actually reef. I was saying that. . .

BC: Or the folded. . . ?

OE: Folded fault. That was recognized, this is an interesting story, Betty and I think not many people know it. It was again, back in the days when I worked with Dr. B. R. MacKay, he should be given quite a bit of credit for it, mainly because he resurrected the theme which had been buried before that. Bill Farmelow??? was our neighbour and myself both were involved a little in that. It goes back to something like 1940 when 3 geologists, Hake, Willis and Addison, all from the United States, worked in the mountains and they developed this theme, I imagine before 1940 or were about to publish in 1940. But before you could publish an article so different or any article it had to pass three senior editors. None of them. . they couldn't agree that it was ready for publication so it was turned down. So it was never published until some years later. Here's where Dr. B. R. MacKay was involved. He was mapping that area and he was finding things that we were finding many miles south and he remembered these 3 scientists from the States, Hake, Willis and

Addison and their theory and he recalled that they had written a manuscript that was never accepted. By this time I was with the government Survey in Ottawa and had met two of the man. By this time they couldn't find all their original documents to it but it has been published since then, 1942 I believe, in the Geological Society of America. So this is a continuation of that but the early pioneering work was done north of here and was never accepted till about a few years before we discovered it over here.

#090 BC: So you were really one of the pioneers yourself in actually recording that?

OE: In this area we were I think. But now it's quite common.

BC: when you decided to leave the Survey, why did you decide to go into private industry?

OE: When I left the Survey?

BC: This was '46.

OE: '46. Something like this. The Survey work was very good to us in that it permitted you to do your own work and I liked that part very much, I think many people did. You were your own supervisor and recommendations were generally accepted and you had challenging work. But they could not keep up I think, to the competitive pay. If I recall right as War Time Technologists, after the war was over, we were still temporary, a group of us, and I think the rate was something like \$185 a month. Two things they could not do, they wouldn't give you permanent standing or wouldn't give you any change in pay and by this time in 1945 and 1946 the oil industry was beginning to move in western Canada and the representatives were coming out in great numbers, dining you and giving you offers, were somewhat better. . . not all that. . . quite a bit better. . nearly twice, not twice as much but quite a bit better. Several of us went and we considered that we were the markers in a manner of speaking because nothing was being done and after Dr. Beach, Dr. Spivac, Dr. Bateman, myself and several others left, the Survey found out they were losing many of their men and they had to do something about it. At one time, you may recall Betty, that people were leaving the industry to go back to the Survey, they were over competitive again. It moves back and forth, I think now they're probably not too badly off but I haven't kept up with that. So those were probably the two reasons that. . .

#124 BC: The thing too, was the people from the Survey, the Survey insisted that you had to have at least a Masters and preferably a Ph.D., so they were having very highly educated capable people in the Survey.

OE: At that time you're right Betty, they required a Ph.D. and that's the reason most of the people with the Survey got them or were forced to get them. If they thought to be promotable. . . if you did not have the Ph.D. the word got around that you may not be promoted as much or as far as you would otherwise.

BC: So what made you decide to come to Gulf Oil?

OE: I really don't know if there's any good reason I came to Gulf. Other major companies were also interviewing and the rates were the same, they were competitive rates among the oil companies. Mobil had interviewed me also and I suppose it was a flip of a coin whether I came with Gulf or with Mobil. It might have been the interviewer, they sent their Exploration Managers out to do the interviewing. It might have been just the story that the interviewer told, I don't recall that there's any good reason.

BC: There wasn't anyone in Gulf Oil that you knew that was. . .?

OE: No, I didn't know anyone in Gulf at that time or with Mobil.

BC: Were you married at this time?

OE: No. That was '46, I got married in 1950.

BC: So you came out to. . .did they move you out to Calgary?

OE: Not only moved to Calgary. . I recall the move very well. I had to go to Calgary by way of Chicago for my orals, for my dissertation. The government Survey were very good that way that they let you work on your dissertation and I completed it. But my orals were set for the end of May and my work started with Gulf on the 1st of June. I came directly from Chicago to Calgary and I recall when I came to Calgary, it must have been about a day or two later, I was out of Calgary from June until October in the middle of the northern British Columbia mountains and foothills, with about two days to get ready to go for about five months back in the bush again this time with a company this time instead of the government, same type of work.

#158 BC: What part of the country were you surveying then?

OE: This was west of Grande Prairie, Alberta in British Columbia, between the Wapiti River in the south and the Murray River in the north. This was part of a five company survey called the Northern Foothills Agreement. Each company had agreed to do a portion of British Columbia and Alberta foothills and mountains. Gulf at that time, called Canadian Gulf Oil Company, they were assigned the portion between the Wapiti River, to the B.C., Alberta border north to the Murray River. Imperial Oil was assigned the area south of the Wapiti River and the area north of the Murray River was assigned I think, to Texaco or Shell. The five companies in the Regional Northern Foothills Agreement.

BC: Who were the others, there was Gulf, Texaco, Imperial?

OE: Mobil and Shell.

BC: I think so, Imperial Texaco, Mobil, Gulf and Shell, those were the five.

OE: That later decreased to four, Imperial dropped out and the NFA or the Northern Foothills Agreement carried on for many years afterward in exploration and drilling in British Columbia.

BC: At that time, had the companies decided they would pool their resources together or was it a government sponsored type of thing?

OE: That surface party in 1946 was a pooled arrangement and the companies. . each company did their own mapping. Later on the five maps were integrated as one large regional map.

BC: But it had nothing to do with government suggesting this be done?

OE: No, this was all done on behalf of the companies. I don't recall the government had anything to do with that at all.

#191 BC: And their would be mutual sharing. It wasn't considered a cartel of any sort?

OE: They may not have known the word at that time. It was a regional map that the government in time would have probably mapped anyway but at that time it was not available so the companies agreed to do it and then they competed. They didn't compete, they worked as a four company group north of there, jointly. Imperial dropped out so. .

BC: Why did Imperial drop out do you know?

OE: I don't know. We used to watch their progress as they dropped out and it seemed like they had more flexibility for one thing and they were able to move faster in different areas.

These meetings went on and on, every time there was a land fill or a recommendation to drill or anything like that, it took a lot longer for four companies to agree than for one company.

BC: So it was all. . . any drilling you did there was done as a joint venture too?

OE: The first . . . what we were involved with at that time was just the surface geological survey part, the mapping and that was fine. Then that carried on with the four companies in British Columbia alone to exploration and development even. Finally it broke up several years ago, I don't remember the date.

BC: What fields were discovered through this?

OE: There were several. Several fields. Nig?? Creek gas found was one of them, in the Boundary area, near Fort St. John in British Columbia. It was probably not a bad system to pool your money in the rank wildcat country. For geophysics later on too, the surface work is only the beginning. From then on they went to seismic work and drilling in the plains area. This early part in 1946 was just. . .

#222 BC: It would be up right into the foothills of the Rockies of the B.C. area, did you move that far west?

OE: Where we were, we went where the outcrops were and that was foothills and actually mountain front, yes.

BC: Gulf did quite a lot of initial surveying, geological and seismic survey in the foothills area but didn't really pursue the foothills in their drilling operations the same did they? I have a note here, for instance, they were very active in the Pincher but then Shell did a lot more foothills work.

OE: Gulf was active in Pincher mainly. Then there other activities, I think you're right, in terms of, they began to maximize their efforts more in the plains about that time in the Stettler and Big Valley reef days. And they left that and then they went back into there in the Rocky Mountain area. They were back in there with the CFA which is the company arrangement with the foothills agreement.

BC: When did that happen, who were the companies involved in that?

OE: I'm trying to remember now. It was Royalite, Sun and British Petroleum and Gulf through Royalite got an interest in the Central Foothills area, CFA stands for Central Foothills Agreement. I don't know how long that lasted. I've been retired from Gulf. But it was active for some time with Triad originally, which later BP and Gulf, the two companies. I don't remember what happened there but they were involved at one time. So yes, Gulf did maintain it's activity from say, Rocky Mountain House northward. A lot of seismic work was done in the early years but they had not done too much from Rocky Mountain House southward to Pincher Creek.

#263 BC: Was there any reason for that or just strictly where you can put your money?

OE: I suspect, thinking back, that the area of the Central Foothills Agreement happened to be from about Nordegg north to Jasper-Edson area and there was a huge . . . and it was also prospective country there that no one knew much about and there had been gas and oil discoveries had been found, mainly gas fields. So they just specialized in that part of the country, they couldn't be everywhere I suspect.

BC: In 1946 when you went out on this first field trip after two days in Calgary, wouldn't even

have time to find yourself an apartment I'm sure. . .

OE: I can't remember whether it was one day or two days.

BC: Yes. Who was with you?

OE: Stan Pearson had just gotten out of the Army and he had been hired as the first geologist by the Canadian Gulf Oil Company by Bob Lockwood, whose name I mentioned before. He had assembled the field party for us in the Fort St. John area, he had the packer and the cook and the assistant packer and the guide, they were all from the Fort St. John country. The guide actually was not, the guide, ??? Duke, lived on the British Columbia-Alberta border. He was a trapper and guide, we hired him because he knew the country. The other people were from around the Fort St. John country, a pack train of horses, something like 20 horses and 5 men, 6 men, whatever it was.

BC: You hadn't known Stan Pearson before?

OE: Oh yes. We had been in university together. I think he was a year behind me but I knew him, not that well but I knew him before at university.

#297 BC: What can you remember about Mr. Pearson.

OE: I remember him as a wrestler. He was a good man, he was never give up. I would say Betty, that, I don't know if he recalls it as one of the toughest times in his life outside of the war effort but one of our toughest days. . . my toughest day that I remember was with him one day when I guess we went through everything. And we were angry by 9:00 that night and I'll just record it, mention it because it's interesting, the pack string, the horses and the men, we agreed where we would meet them on air photos. They had and air photo, we had an air photo. We would do a little geology and meet them from Point A, we would go to Point B. they started off and we started off, the two of us on foot. The first thing we encountered was. . no, we had horses, pardon me, we had horses, so we started off and did our geology until we got left behind. The first thing we encountered were the remains of a forest fire and to get through that one horse got his foot burnt a bit, there was no problem. But we were to meet them that evening in a valley on the north side of, I think it was the Murray River, it was a pretty big river anyway. Evening was coming along and no sign of the pack string, we tired to read the trail and we think we still followed them. But they weren't where they said they would be and where we agreed to be. By this time it was starting to get dark and we kept on going with out saddle horses and finally here ahead of us, it's pretty well dark by this time, this is in the fall of the year, is Joe Ferguson, our pack head, with a horse. We came to him and said, where's the camp. By this time it was raining, we'd been through the forest fire, on the edge, it was raining, we were cold and miserable and it was getting late and Joe Ferguson pointed across the river, it was dark but there was a fire, he said, there's our camp across the river. We said, how do we get there, he said, we swim the horses across this river. It was dark, pitch dark practically, which you'll see in a little while. So Joe said, I'll go first, you follow. So he disappeared in the water with his horse and we followed. We made an error which we got the tongue lashing of our lives, but we didn't know, it was dark. Joe slipped off the saddle on the down water side, you don't go on the up water side, you can slip under the horse. The water was deep and the river was pretty wide and it was dark so we didn't see him slip off his horse and hang on to the saddle horn presumably, and we just stayed in our saddles with our feet out of the stirrups at least, we'd learned that. We all

got across safely, wet of course, and wet up to your neck I suppose. When we got across, sitting in our saddles, Joe Ferguson saw us there and he gave us this tongue lacing I mentioned. You should have gotten off your horses. Well, we didn't know he had. If that wasn't bad enough, a bad day to begin with, we get up to the other side and the rest of the camp, the three men had just gotten there before us and the tents were still down. So after 9:00, we hadn't eaten dinner, there were no tents up, we put the tents up, ate dinner, helped put the tents up and we thought they'd be all done for us. Then by next day, the sun began to shine and we took the day off, we called it Saturday or Sunday. By this time the camp crew, the packer and the cook and the camper's helper, I think, thought that we were crazy because the next day Stan Pearson, who I told you was quite athletic and dedicated, he set up a bar for high jump or broad jump or something and we were out practicing jumping on a Sunday. As if we hadn't had enough exercise the day before. They couldn't understand that. I don't know if I did either. Anyway we did it.

#391 BC: He was a very athletic person?

OE: Yes. Stan was very athletic. Another occasion, this was interesting and he'll remember this one, Pete Sheck, whom I mentioned, who had been at reform school and after he got to know him, showed some of the clippings he had saved and carried with him. He wouldn't show it to you until he got to know you very well. He was very proud of his clippings, where he'd been in jail in Fort St. John for kicking somebody in the ribs. He and Stan one Sunday, this brings out Stan's athletic prowess, he and Stan one Sunday had a little friendly wrestling match. Stan had studied it and wrestled it in university and Pete was just brute strength. I think they came out even.

End of tape.

Tape 3 Side 1

BC: If we could just carry on with some of the highlights of your career in Gulf in Canada?

OE: Okay, Betty. I mentioned first was sort of a highlight and a shock was the difference between government work and industry work. And you get used to that. I imagine the real highlights came when you are on your first wells, which is so different. We were always helped by people from the United States with experience on those items, I'll come to that another time. But the highlight came when we made an exploration discovery, our first well in Pincher Creek. I wasn't on that well, Stan Pearson was at that time. I was on the second well. And then the oil well in Stettler that came in, the first well.

BC: Were you on that one?

OE: I was on the dry holes every time.

BC: Oh isn't that rough. What was the feeling when you had been waiting and waiting and then the dry hole, that must have been. . . ?

OE: We've got to take a little credit. We were pretty ignorant of the oil business and on my second year with Gulf, on the first well we drilled in Pincher Creek, the Gerard well, it was not a discovery but I suspect if we look at a map today, it wasn't that far from the edge of the field. And we reported what we saw in that samples. We had been trained

very well by Max Littlefield and Bob Lockwood. Max Littlefield was the Regional Geologist for the Gulf companies, he was sent up here to help out and Bob Lockwood was the Exploration Manager. So there were no Canadian people with too much training, so we were trained by the U.S. Gulf people. I recall the Gerard well, drilled I think, in 1948. It was dry but we sent weekly letters in and it was 24 hour a day work on the well and you'd submit your letter and core analysis and the sample interpretation and another dry hole. But to me, as far as I was concerned something we wrote in the weekly letter kept Mr. Lockwood interested. I'd even forgotten what we had said, and I guess I had said there was staining, oil staining on top of the niscue, D-2, when we entered the upper Devonian formation. And that was an encouragement that helped keep Gulf in there anyway. So that we found out that the field was a short distance west of where we drilled the dry hole. At that time, mind you there wasn't another well within 50 miles or something of that nature. You had no information to go on.

#036 BC: That would be pretty exciting then.

OE: It wasn't too exciting to have dry hole but to know later that it was so close to the field and the excitement came when we did drill the discovery well only a short distance from there. At that time I was assigned to Redwater and Jim Bryant was on the well when they tested it and oil was filling the pipe and he was trying to get a sample and stumbling and slipping all around I understood. So I came back afterwards to see it. So that was an exciting time.

BC: What about in Stettler, were there any highlights there that you can think of?

OE: We were the first active company. After we drilled the dry hole or during the seismic exploration at a dry hole, you wonder what went wrong and Bob Lockwood tried another tool. I'm not sure if Gulf introduced this tool, this is something that started another industry up and Gulf was one of the first ones to actively use it anyway and that was the core drill, which is shallow drilling. We brought in Hub City Drilling, the Simpson Brothers from Saskatoon and they were green as grass on how to operate the shallow wells. It's now called. . .they use the shallow drills on seismic equipment but these would go deeper, they would go to 1,000' and then the holes would be logged and on the electrical log the geologist would find certain markers. So these wells would be drilled every mile and try to correlate some sub-surface marker. It may not have been the answer to the discovery well but one thing the core drill did which is something new in that area, like I mentioned, was to keep the company exploring an area which was getting a little discouraging after one or two dry holes. The geophysicists then kept checking their seismic picture and the geologist kept checking their shallow markers and finally they did drill the discovery well based on seismic and core drill and dry holes. I don't believe that core drill should have gotten any credit for it because it happened to coincide with the deep structure. But it at least led to the discovery. After that every company started to use a core drill as a sort of a magic tool as I recall. One time Gulf had 4 or 5 or 6 core drills working, they're expensive too.

#073 BC: They're not used today?

OE: They're not used at this time, I don't think there's one core drill being used now. They are still a necessary tool in the areas where the geophysical picture is poor because of surface

problems.

BC: Surface problems, such as?

OE: Sand. In the Acheson and Stony Plain area the records were very poor. Companies were using core drill there, they would get below. . . because of sand near the surface and problems that the records were not coming through very accurately. Many companies were using the core drill there and I do believe in that area the core drill was a viable tool. It would show structure at higher levels mapping coal seams or markers that did reflect the reef underneath.

BC: It wouldn't be suitable, for instance up in the muskeg area, would it be useful there?

OE: No the muskeg area would be. . .

BC: where they might have trouble with the geophysical equipment because of the muskeg.

OE: There the answer has been wintertime operations as you know, when the muskeg's frozen. And I don't think the core drilling has been used in the deeper areas, in the muskeg areas, a lot of them are in the deeper areas.

BC: We're looking through, after that when they used the core drill, what other things have you seen. You've seen many changes in the time that you've been with the industry because you've been with them for many years. From Stettler, where did Gulf move from there?

OE: Stettler was in '48 and they moved southward toward the Big Valley area and discovered a succession of pools that were part of the same general trend but different structures of the same trend. Reef, both the D-3, Leduc reef and the D-2, Niscue overlying carbonate were productive for 20-30 miles from Stettler southward to Big Valley and beyond. And I read just the other day that Gulf is still drilling deep tests in the same area, so, 1948. . . 34 years later and still drilling so they haven't given up yet.

#105 BC: So they haven't given up, there's still oil to be found in Alberta.

OE: And they have found some lately I'm told, I don't know the exact location but in that same general area.

BC: What has been the biggest change do you feel, in the time that you have been in the oil industry, from when you first went out on that first Geological Survey crew back there in 1940?

OE: The one big change, not the largest but one very significant change has been and we started to talk about it earlier, that when I came to Calgary with the Canadian Gulf Oil Company and before I came, the emphasis in western Canada was on surface geological mapping. The mountains and foothills, from Alberta north to the Arctic if you will. In the last several year, surface mapping, except for isolated cases is practically left alone except for government surveys. Companies are not doing any extensive surface mapping at all, for good reason, there are enough valuable holes that give information that have been drilled, several thousand a year, that takes many, many geologists to even interpret the information from the wildcat and development holes that have been drilled since then. So one big change has been the change of activity from the outcrop areas in the foothills and mountains to sub-surface geological work. And that's gone on for several years actually, since the first holes were drilled. In fact, that change was apparent in the early years, I came with Gulf Canada, or Canadian Gulf Oil Company at that time, where rows of geologists would be sitting in the Energy Board, at that time called the Conservation

Board, with microscopes studying the samples of the few wells that had been drilled up to that time and that were drilling at that time. And that has continued, there's core facilities and sample facilities that are still visited and being worked on by the office. But the big change was that before that very few people did sub-surface work, most of it was done on the surface.

#139 BC: So this would have changed the education of a geologist?

OE: So much that when I went to university, if you were to do a dissertation on a thesis area, normally it would be in an outcrop area in the foothills or mountains, or some river cuts that showed exposures. I imagine if you went to the University of Calgary or the University of Alberta now, Betty, you would find any number that were based only on well information, log information from the wells. I know that it's true because I've seen many of them, Masters thesis and Ph.D. thesis.

BC: A lot easier than walking all over the foothills as you had to do.

OE: And brought in. . . I should mention. . . a lot of computer usage being involved nowadays too, where it used to be done longhand.

BC: With the computer coming in, this has been a big change for a lot of the professional scientists in the petroleum industry, of adjusting to the computer and utilizing it. At first computers were thought of as something to keep the books, but then suddenly they started to do a lot of other things. How did you find adjusting to the computer age as a manager?

OE: We welcomed it. I recall when Gulf was introducing that many years ago into Calgary, bringing in the computers, through the outside window sometimes, they wouldn't fit through the doors. And they required better rooming facilities and temperature and humidity controls than did the geophysicist and the geologists. They had to have a certain, very accurate. . . and clean the rooms, no smoking.

BC: That must have made them a little bit. . . never mind the geophysicists and geologists being at one another's throats, they must have all hated the computer to begin with.

OE: But they were a very, very definite asset to doing work that could never have been done before that people knew should be done and could be done but it would take hundreds of years, which they can now do in a few hours. And they undoubtedly brought in greater detail and accuracy than we've ever known before.

#173 BC: Did you find once the computer came in, were you having more success, when you finally . . . the ultimate aim of course, is to drill a well?

OE: Betty, people might argue this but I suspect that the old field records that Gulf had in the early 40's and late 40's and early 50's, before the computer age found bigger discoveries than they've found since. Mainly because, normally big things are found first. And if you had any type of seismic control and Cedric will tell you what the old fashioned seismic hand worked sections were and how long it took and how irritating it must have been but they were the ones that found the Leduc's of Imperial Oil and the Stettler's of Gulf and the Big Valley's and the Pincher Creek's, the hand worked one without the computer. The reason was that Canada had no exploration up until that time and you would normally find the elephants, if there are any elephants there, they're the ones that will be found first.

BC: You don't think there are any more elephants left?

OE: No I didn't say that. They're more difficult to find and they could be what they call, stratigraphic tests which are very difficult to find. A few years ago, Chevron came up with West Pembina, very difficult and give credit to the seismic completely there. And the government of Alberta, who helped sponsor the seismic program.

BC: And did the computer help in that case?

OE: Undoubtedly it was very sophisticated computer work and probably working with their head office scientists in California too, to come up with what they did. I am told that they didn't find what they thought they were going to find. They thought I am told, that they were looking for a deeper reef and they found a shallower reef, a new reef, a shallower one this time. So they didn't have the exact truth but they still found something that led to a few hundred billion barrels of oil, of new oil.

#208 BC: After all the data is gathered, the decision finally, you can have the geophysicists and the computers and the geologists and everybody else working. . but in your position, eventually, the decision had to be made. Do you drill here or here or here or do you not drill. What was it like, having to make those kinds of decisions which represent many hundreds of thousands of dollars.

OE: My recollection is that decisions didn't hit myself or any one person too heavily because we shared it among several people. If we couldn't agree then probably the well was not drilled, our V.P. or Exploration Manager normally had the more final say on it but he bore the brunt of it. He'd listen to the story from various angles, from the geologists, the geophysicists, the land people it would involve even because if you don't have a large enough block of land you may not want to drill either because you find something, you don't control enough of the area. Also more and more the economics came in. More and more of the companies were requiring an economic feasibility assessment, what do you expect to find and if you found what you expect to find, is it worth looking for.

BC: Would this be difficult for you to come up with when you didn't know what was beneath there, did you find this difficult?

OE: I wouldn't be that closely involved with all the detail, we'd all share it but that was one of the problems because when the gas was 10 cents and oil was a dollar a barrel, it would have to be a pretty big thing to even warrant drilling it. If you made people responsible for the economics many of the wells would never be drilled. . .I'm not saying it correctly. . . If the economics were not good enough, the wells were not drilled or were postponed. And sometimes we would find out we didn't have enough data, most of the time we didn't have enough data on which to base the economics actually.

#244 BC: But if you'd had more data . . .perhaps the computer assisted the data at sometimes. .they might have, have they subsequently. . have there been wells drilled subsequent to where you've had a negative decision at one point and then they've changed?

OE: Undoubtedly. And every company, including Gulf has given up land which now has viable oil or gas fields on it. Some of it because the gas price has gone up 10 or 15 fold as well as the oil prices, from \$1.50 to \$24-\$35 a barrel.

BC: Did you ever have in your time with gulf, where you really felt, yes, I want that and I really feel we've got it and they didn't drill and the disappointment of them not drilling or

the subsequent pleasure in finding later it was drilled and you were right?

OE: Probably but what comes to my mind is how close we missed finding a field and someone else got in there. This was a specific example, in the Strachan??? area, northwest of Calgary. Harry Carlyle and I went back and examined our recommendations at that time and what went wrong. As I recall it, there was a small seismic feature in an area which had no wells for miles around, Gulf drilled the first well. We elected to drill on a little closure in a certain section and drilled and found the D-3 reef in a previously unknown area. But on test it gave mainly water and a little gas. That is now the Strachan field, which has a sulphur plant, gas plant on it. What really makes you cry nearly, the same section that we drilled on, we let it go back to the Crown as a dry hole on it, you got to pay \$1 a year rental on it. We recommended to let that expire and not too long after it was bought by another company for about \$1 million and they drilled a lovely well only half a mile away. Why Gulf drilled and why we drilled and recommended the location, we wonder, because we did not even select an inside location. We expected gas to be the normal hydro-carbon from that area and we should have at least selected one of the inside locations. We did not we selected an outside one, in the corridor half a mile away we'd have had a good well. We did have a marginal well and the other thing that went wrong I think, was the drill stem test was over an interval that covered both the gas portion and the water portion and the water drowned out the gas so we did not even appreciate what that well really had. So that is now the very large Strachan field and since then other fields have been found nearby in the same reef. After Gulf dropped it and abandoned the well, another company, Chevron got in and they tried, they found the reef water bearing. It wasn't until some years later that Gulf farmed out some land nearby to a small company who were going to produce sulphur, which was at a high price then, from all the salt water we got. And guess what Betty, they got gas, not oil, gas. And that was the real beginning of the Strachan field. Gulf still had an interest but it lost a lot of its interest because we farmed out a lot of the lands with the bad luck on the first well, which as I said, was half a mile from a very good producer.

#314 BC: Do you remember the name of the company that did find the gas?

OE: It was a small. . .I should remember the name, it was a number of years ago and the well is still producing, it was a small company and I think wanted to forget that they were looking for sulphur. On a theme that made no sense to any of us and that was, you can find a lot of hydrogen sulphide in gas under pressure and it comes out in piles of sulphur you can see anywhere, when it's separated from the gas. But when water has sulphur in it, there's no way that it can produce piles of sulphur, it's not compressible, it doesn't dissolve in that proportion. But that company had a theme that they could produce sulphur from all the salt water that they knew was present.

BC: Well, that didn't work out but they ended up more or less forgetting about sulphur.

OE: And it's been a pretty big. . .it's a small company but it's integrated with other companies too, so I don't remember, I should remember the name but my memory is not good on that.

BC: I want to talk to you about some of the people and your memory of them. You have mentioned Bob Lockwood, who was your first boss, could you tell me a little about Mr. Lockwood.

OE: R.P. or Robert Lockwood was sent to Canada, to Alberta by the Gulf people in the States because he had had oil experience in Michigan and other areas of the United States. There were no people really in Canada that had oil experience. There were a few of the old timers, Joe Irwin, Ted Link, Jack Webb, J. O. G. Sanderson come to my mind immediately that were the old time consultants, that did have oil experience. But when companies began to check on Alberta, investigate this Alberta as a place to put money, they sent some of their Exploration Managers up, who carried on a sort of a waiting game. Like you mentioned earlier, you should study for awhile before you do something, well some of them studied for 1 or 2 years. Bob Lockwood was one of the early ones sent up and he wrote weekly letters to his head office. He helped Carl Nickle assemble the Daily Oil Bulletin, which started in the same building. There were only a handful of people in town at that time, very early 40's, I was going to school at that time, I think 1943, something like that. So Bob was a very dedicated exploration geologist and exploration manager who. . . I guess he worked night and day on it. And I give him a lot of credit for Gulf's position in Stettler, Pincher Creek and areas like that. There was no data to really work on to where did you select lands. Large blocks of lands were available for requesting from the Crown practically. Others were from Canadian Pacific and Mr. Lockwood recommended acreage in the Drumheller to Stettler area which was Canadian Pacific lands. I don't recall if it was a million or 2 million acres and I think the rental at one time was 10 cents an acre. And that is where the Stettler and the Big Valley fields developed. The basis for his geology, there was no data to speak of, sub-surface data, one or two wells, which I remember studying one well with a microscope and the samples were poor and there were no logs to speak of so you got very little help from that. Bob told me one day why he recommended the area and it was based on surface geological mapping that Dr. Allen from the University of Alberta, Edmonton had done. He had put out a map of the province of Alberta, the regional geology surface map of the province of Alberta and Mr. Lockwood noticed that there was a widening of the interval on the . . . that's not the right word. . . . There was a change in the direction of the exposures of the surface rocks in a certain area and a certain attitude to them that interested him and he said that should be a good place to take land. There was no deep well information to go on at that time so he did the best he could with what little he had. Fortunately it included Stettler, Big Valley. Gulf didn't have, unfortunately, Redwater at that time, but they had some interest in it because of the CPR lands again too.

End of tape.

Tape 3 Side 2

BC: [in mid sentence]. . on the foothills?

OE: I don't know the real reason, I was here for it, why the mood but my conception of it was that they were working both areas simultaneously also. I had mentioned earlier to you Betty, that the early gravity work was done north of Pincher Creek in Turner Valley and they saw some success there and they brought in seismic crews in the early 1940's and developed and found the Pincher Creek field, the structure.

BC: Sorry to have to stop you there for a moment Oscar.

OE: Yes. The Northern Foothills Agreement was as I think we mentioned before, originally taken out by companies, Sun Oil was one and Royalite was another. Oh, the Northern Foothills Agreement, pardon me I was thinking of. . .

BC: Yes the Northern Foothills Agreement. I think there was Texaco, Mobil, Gulf and Shell.

OE: They had agreed, the 5 companies, because of the great cost of exploration that they would divide the fringe of the foothills from about Jasper north to the Peace River area, among the 4 companies that you mentioned. And the first job that Stan Pearson and myself were assigned to was doing the surface work on one portion of it, the gulf portion.

BC: Where was that?

OE: That was between the Wapiti River in the south and the Murray River in the north and it constituted some 2,500 square miles as I recall. Our job was to do the surface geology, Imperial was working directly south of us, south of the Wapiti River and Mobil was working north of the Wapiti River and I'm not sure where the other two companies were working, Shell and Texaco. So we spent from June to October doing the geological surface work in that area, the outcrops of the rocks. Collect fossils, measure and identify coal seams, that was part of our job we felt, so we did do quite a bit of coal work, which incidentally is now being investigated by companies and will be put on production in the next few years.

#032 BC: These are independent coal companies, they're not Gulf companies or. . .?

OE: Gulf is not involved I don't believe. Imperial has been and Dennison Mines, TechCorp. There are several companies involved and I read lately where there are plans of spending millions and millions of dollars and finally a railroad that will take the coal into Prince Rupert.

BC: What about the success of the petroleum discoveries, how successful was your work there?

OE: Our work was during the summer of 1946, following that we put out a report as did the other companies, and we shared the reports among the five companies. I don't recall there was any immediate work by the companies based on our work. They were working by this time on the plains because Leduc had been discovered just that same summer as our reports were coming out. So that took the pressure in my mind, off of the deeper and more complicated foothills structures.

BC: You feel that's one of the reasons, because of Leduc, that it was easier to find it out there so they did.

OE: Once Leduc came on I believe a lot of the emphasis was shifted quite rapidly to the plains from any of the earlier work. The earlier work was mainly in the foothills and constituted field work because the rocks were exposed there. On the plains there are very few of the rocks exposed except the very young ones which give you leads only. And there your subject then to doing the exploration by gravity work and seismic and what little surface geology you could get along the river cuts.

#055 BC: Do you feel at that point there became a different emphasis on the role of the geologist vis a vis the geophysicist. Because Leduc was really a geophysical discovery was it not?

OE: Leduc was a geophysical discovery. The original intent, you know the story there, pre

1947, which is by the way, given very nicely in little bits in the last issue of the Reservoir Magazine. Aubrey Kerr has summarized the history of the CSPG, but it also gives you a history of the oil industry in Alberta. The geophysicists found a place to drill, they found something that looked like a structure undoubtedly, the theme though as I understood it was that Imperial really had been looking for oil. . . spent what was it, \$95 million, some huge amount of money, that wasn't the right amount and they finally were giving up hope of finding any success in oil and were looking at the Fisher-Tropes??? method for turning gas into liquid hydrocarbons. And they were drilling this last well in Leduc to give the last chance on something deeper, no one knew what was down deeper and you've heard various stories. It was during the weekend and somebody said, what do we do and they said, let's keep going until Monday morning, you hear various stories and they discovered the Niscue at the D-2 over that weekend, February 13th, 1947. Then following that of course, a lot of the emphasis that had not been in the plains went immediately, practically to the plains.

#078 BC: And did emphasis also go to the geophysicist rather than depending. . it used to be sort of the final word was the geologist?

OE: Yes, there was no geology you could do to speak of so the expression tool immediately was the seismograph because it had been responsible for the first location undoubtedly. And the gravity meter had been used before and it continued as the reconnaissance tool mainly, you don't drill on gravity surveys but you get a lot of leads from that. So geophysics came into the fore. Gulf had as many as a dozen seismic crews operating for them and all major companies had numerous seismic crews after that for the next. . and it continued until only a few years ago.

BC: There often is said to be sort of two sides of the interpretation of the lands in the discovery . . . looking for. . well, not just petroleum but other things, and that the geologist and the geophysicist don't always see eye to eye.

OE: No. I've been talking to Aubrey Kerr lately, in fact, he was trying to get out a story on what he called the two solitudes, have you talked to him on that?

BC: No, I haven't.

OE: You can imagine what that means, the geophysicist and the geologist. We worked together for awhile on the possible article and I gave up. But I gave him some leads and we exchanged notes on that and this is in answer to your question too Betty, at one time certain companies had a closed door policy. It wasn't the door, in a sense it was a wall between the geological offices and the geophysicists and the reason given was that we want each of them to do their own independent work, rather than work together and cooperate. I heard another story not too long ago, where a friend of mine, a geophysicist came from one company to another, he saw many erasures on a regional map, a seismic map that he was assigned, he was taking over the geophysical department of a very large company. He asked what is the meaning of these erasures on this map and was told that those were data from wells, the detail from the wells but we did not want the geophysicist to be prejudiced so we have removed all that evidence. Which sounds ridiculous to me.

#115 BC: Did you find that at all in Gulf Oil, did they work separately?

OE: On the contrary. We had quite a story and a series of attempts to . . .in fact, I think Mr.

Pearson at one time, the Exploration Manager, he was going to force this normal separation. There was a lack of cooperation but I think it was based mainly, and I've always thought that for many years, it was based on the fact the geologists knew geology mainly and geophysicists knew geophysics mainly and it's like never the twain shall meet because neither one was going to admit to the other that he did not know the other subject so he kept to his own subject.

BC: Did you find that this hampered your work in. . .you were a geologist and certainly were in charge of this are, with many geophysicists and geologists working there?

OE: We went to the stage where Mr. Pearson was the Exploration Manager with Gulf, I was the Chief Geologist and at one stage, under the Chief Geologist we had both the geophysicists and the geologists. This had two errors that we recognized and changed. One was it made the geophysics and the department of geophysics, the group of geophysicists, second rate citizens compared to geologists.

#138 BC: Why would that be, because the geologists were always the final arbiter?

OE: I don't know the reason. Geophysics was considered the tool of the geologists, that's why. But this was not working and they were not happy to work. . .on their basis they were an equal group of graduates, geophysics and geologists were both equally graded. One was the story of the earth and the other was the study of the earth. . whatever the geophysicist was. I was going to say we tried to force cooperation by putting geology and geophysics under the same manager, at one time it was myself. It didn't work.

BC: Why didn't it work?

OE: They were insulted, the geophysicists were insulted, I think in my mind, that they were one grade lower than the geologists because the geologists were ahead of them.

BC: How were they ahead, do you mean in pay or in rules or. . ?

OE: A geologist was the supervisor of the geophysicists. We corrected that quite a bit by the following year I recall, by creating equal level on any chart. The Chief Geologist, Chief Geophysicist and Chief Landman, the Landman was not necessarily equal pay but equal on the organizational chart. And that did help. On the other hand, it still did not seem to resolve the problem and you can check with Cedric, he may have a different answer to that. But you could not get the cooperation that you should have had, you got more cooperation. There were meetings that were held to acquaint the geophysicists with the geology and the geologists with the geophysics. There were meeting of this type, this goes back many years now. I do not know if the answer was finally resolved or still is resolved and I'm speaking for Gulf, as I knew it at Gulf. The final . . . it wasn't the final answer but another change was affected after that and this should have worked better and that was the groups of geologists and geophysicists were now considered as explorationists. And the head of one group would be a geophysicist, under him there would be geologists and geophysicists, a head of another group would be a geologist and under him would be geologists and geophysicists. The overall supervisor might be a geologist or geophysicist. So it's gone that route and that's certainly better than when we were there. But our company, I suspect, Gulf at that time was better organized for cooperation than other companies.

#180 BC: So in other companies, you would have found at that time that there was a real,

two camps?

OE: We had heard that there was and had been and we had. . . not a self imposed one with Gulf but it sort of went that way unless you tried to correct it. There are exceptions. There were some cases of some excellent cooperation in the very early days and in my mind, I'm not sure if this is a true answer or not, it developed when the geologists and the geophysicist were good personal friends and skied together and they were assigned together they worked together and I think it helped when they were good personal friends.

BC: Is this important, do you feel in the work within an exploration company that it is team work?

OE: Very, very important. You will see an article that Aubrey Kerr is getting together and we've helped him a bit on this, there are cases where he may have mentioned this, he mentioned. . . the story will be 'Geological Fences' but I can remember cases myself where exploration plays were not taken proper advantage of because. . . it wasn't a rift but it was just not enough cooperation.

BC: Can you cite a specific one without breaking the confidentiality of. . . ?

OE: I'm thinking of an example in northwest Alberta where the geophysicist had found a structure. At that time, the only structures at a certain level of the geological section of that type were the Leduc D-3 reef. This did not fit the geological D-3 reef picture, it was a structure deeper. My memory is a little faint on this but the story as I understand it was, it couldn't be a reef, there's something wrong because D-3 would be higher up. The answer of course, was this is a deeper reef called the middle-Devonian, Keg River reef, which gave . . . well, the Rainbow area and the Zama Lake area, that type of an example is indicative of the type of thing that could happen if you do not cooperate in the geology and the geophysics.

#220 BC: So at that time they didn't drill?

OE: I don't believe in that one case they did drill at that time. Not until somebody discovered the Keg River reef and then found that was the answer. The other example in the foothills might be a little different, there are examples that I'm thinking of and I don't know if it's resolved yet. A geophysicist has the picture at 12,000' below the ground in the Pincher Creek field, had it before the geologist, the geophysicist interpreted it as a fault, what we call a thrust fault, because the beds on the west side are higher than the same reflecting beds on the east side which gives you the typical structure, west dipping. A geologist will come along and he will say, that seems strange to me because my experience in the foothills, he might say, to the west in the mountains, are that the rocks are more likely to turn over in a sharp anti-cline, Turtle Mountain is an example, rather than a fault as was mapped by the geophysicist. This really doesn't matter too much because either way it's a drillable structure. I don't know if the answer is still known, whether it's a turned over, sharp anti-cline or a faulted structure or a combination, it's probably a combination. But those are smaller matters because the structure is still there and the geophysicist mapped it adequately enough to be drilled.

BC: So even if they call it different things way down, 12,000', it still did not prevent drilling in that instance?

OE: No, it was still worthwhile doing. Another example which is more difficult and I'll mention the area, it's my own impression and I suspect it's not far from the truth. In the

Peace River arch area, geologists had known for many years that it's a very complicated area. A retired Imperial Oil geologist, he called it an area of jostling blocks, he used that term as I recall, 25 years ago, he gave that talk.

#258 BC: Do you remember who it was that said that?

OE: His name has escaped me but he is a self trained, retired Imperial Oil geologist that raised in the Turner Valley days, I should know his name but he's written a book. . you may know it if I don't. To continue this example, which is probably a better example, Peace River has fault blocks, which are stresses in the rock which have given away and one part of the rock, regionally, has dropped relative to the other part. The trends of these faults tend to be northwest, southeast or northeast, southwest. Geologists knew that these were happening regionally from the few wells drilled. They just didn't make too much sense, at some time. But some of the faults and lineaments??? were so small of a separation, they weren't 1,000' or 2,000' like you have in the foothills, only 100 or 200 or 300 feet. And the seismic tool at 6,000'-8,000' does not pick up, at that time anyway, little differences of elevation on the same marker beds of 100 or 200 or 300 feet. I recall the seismic maps and there's no fault of the interpretation, it was the best they could do at that time. It would show a gentle warp. More and more wells were drilled and the fields seemed to fall on the high part of the warp, together geologists and geophysicists, I recall, geologists began to draw these major faults, whether they were in the right spots or not, I'm not sure but at least the theme was introduced there. And from then on the geophysicists began to work more carefully with the geologists and they were mapping the same Mississippian faults that the geologists had indicated. But there's the theme, as far as the geologists knew it was only a theme but they couldn't locate them. The geophysicists could locate something, and instead of warping the maps, some of the maps I had seen had been warped, they now showed definite faults, which is now and has been for some years, the opinion and the resolution of the problem.

#300 BC: And having found that, did this assist in the discovery. . . ?

OE: There are discoveries up there. Gulf was not involved in too many of them, they have not been too active, but they did find gas discoveries mainly. So those are 2 or 3 examples of the type of cooperation that should have been started and didn't. Probably some companies missed out, having earlier discoveries by not cooperating, coordinating the work more carefully.

BC: Do you feel that part of the problem was because the geologist could go to a university and take set courses and you were a geologist. Now it's much more specific, specialized. . . whereas the geophysicist, a lot of them there backgrounds were . . . well the maths and physics, this sort of thing but until fairly recent years, you didn't go in and come out a geophysicist, you came out with maths and physics. But the name wasn't even there.

OE: Yes, Betty, geophysics is a relatively new science, so is geology but it's 100-200 years and geophysics is probably a few tens of years as such. And that might have been the reason certainly. In Gulf at that time, I recall the people had degrees like you said, Engineering, Physics or Math or a combination and they became excellent geophysicists as the term now is used and known. Gulf did send. I don't know if this is related or not, Canadian Gulf. . I never got to go but several of the geologists did go and were sent on a

course or courses to the research people in Pittsburgh. These were courses in geophysics that lasted for a few months as I recall, several months. Several of the geologists went, now the geophysicists never went on the equivalent geological courses, not to that extent. They took short courses at that time, I don't think they still have equivalent courses that last for that long as the geophysics courses last for geologists. Geophysicist also went on these courses, I should have mentioned that, but the geologists did have an early advantage of learning both sides and they would learn quite a bit of geophysics along that. I recall when one of our geologists came back, we had the theme that now that geologists have studied geophysics, I shouldn't report it I don't suppose but I will, he should now have more of a say in Gulf Canada in the contouring and interpretation of the seismic maps. And that just brings another problem to the picture as you can guess. Because he knows his geology, he knows only a little geophysics and the answer was made, I think quite rightly, that no, we've had geophysicists that have been studying and know all about the seismic aspects and the problems of weathering and corrections and what not and we're not going to have a geologist that took a few months of geophysics coming in and start taking over the maps and the contouring of the maps. So that was never done. I don't know if any. . . I think geophysicists still do the main mapping but in cooperation and coordination with the geologists and with more geology background than the early geophysicists had.

- #372 BC: Did you find yourself in your position, where you were the manager over the two, did you find the fact that you were not a geophysicist, did you find this difficult for you in being the manager of the two?
- OE: Yes. It was. I'm afraid it was and I considered it and I used the expression for myself, that nobody will work for a supervisor adequately unless he . . . Not the word respects, unless he feels that he can and I felt a little of that strain there. But we only went over that a short time, we changed that quite rapidly after a relatively short time.
- BC: So you weren't under that stress for too long, because I think it would be quite a stress.
- OE: It was, it didn't seem to be working properly. In fact, we came back and we could have continued, the Exploration Manager asked us, how was it working and I think my comment was not worth a damn. There was a Chief Geophysicist, under the Chief Geologist though, so that downgraded everybody. So we gave them our reasons, I did, and we could have continued that but I think I made the comment that it's not working, we should do something about it and that was corrected quite immediately.
- BC: Looking through your years with Gulf Canada, what are the highlights you see from when you first began with them, the high points in your career with them?
- OE: Well, one of the highlights was that it was certainly a different type of operation than the Geological Survey of Canada. People worked hard at the Geological Survey of Canada, not everybody but you didn't have to and there was not the feeling of minute by minute, you know the feeling you have in the oil business that you've just got to keep running all the time. There's no doubt about it, industry was different than government and I guess that was one big highlight, it was a revelation to myself, where in the Geological Survey you worked an area in the summertime and you worked hard but you had time to complete a proper report the next spring and do another geological survey of another, what they call a map area in great detail, put out a set of maps and the sections the next

spring.

#430 BC: But they weren't going to invest millions of dollars on your report?

OE: No, it was something that you did. . . you interpreted the best you could but you didn't have to worry about the responsibility. With a company all of a sudden you are caught with. . .well, the first year that we did find with the field work, you are given a much larger area and you might work just as hard but you had to cover a much greater area than the government would ever expect you to. So you did the best you could. We called it detailed reconnaissance surveys.

BC: And then at the end of that time, decisions were going to be made.

OE: Yes. Decisions were made but I think we were saved from making too active decision because by that time the exploration activity had moved into the plains and those foothill structure which we had mapped, and we had gas seeps as we mapped and we had anti-clines and we had faults. We gave priority to the structures as we saw them. One or two of these have been drilled but not at that time, some years after that.

BC: Were they successful?

OE: Yes, they got gas there but it's been a long, long and expensive process. There were two anti-clines that had been drilled. . .other people had them also and the seismic work . . they were not drilled. . the early ones might have been, the later ones had seismic information before they were drilled. They were not drilled on surface geology alone.

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Tape 4 Side 1

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Tape 4 Side 2

BC: [in mid sentence]. . . a task master though.

OE: That did come out at that time and I don't think people would recognize that from the outside, but he worked hard himself and he expected a lot out of his own people to the extent that I think I mentioned to you informally that some of us lost quite a few holidays and I guess Mrs. Redman said, she nearly didn't get married.

BC: Tell me about the incident of your planning to get married and the marriage that almost had to be postponed.

OE: Well, I was on the Pincher Creek wells earlier that spring and got acquainted with this former overseas Red Cross girl in Calgary and we got to the stage where we had planned the wedding on May 5th, this was back in 1950. As I recall I didn't see my future wife too often when I was at Pincher Creek because there was a well to be looked after and these operate 24 hours a day so unless the well breaks down or something you don't get away. But it was agreed with Mr. Lockwood that I was being married and had official two weeks holiday. My wife reminds me, and I had forgotten this, that he was about to send me to another assignment to the Stettler, Redwater area.

BC: Was this the day of your wedding?

OE: The day before apparently. My wife urged me to tell him that you were expecting to get married the next day. So her memory is that he went instead and I got married.

BC: He went and he sat the well?

OE: Well, he went to visit the well, I'm not too sure of the details. But when he remembered that he had signed, he permitted it, to get married. The expression at that time was pretty high in his mind, he was very sincere and very hard working. I think he worked evenings and weekends on. . .

#027 BC: He must have been a single man, was he?

OE: No, he was a married man with no family, they did have a dog. He had his one interest in life was oil and gas exploration and he felt that Canada had it and he wanted to try to get the best of it if he could. And he did a lot of good work for Gulf in acquiring their CPR lands for example and recommending the Pincher Creek area. He acquired some of the lands in Redwater. After that we acquired other lands too but we had other managers at that time, but a lot of our production that Gulf still has today is from his early recommendation made in 1947 and '48.

BC: How long were you working with him, how long was he your manager?

OE: When I first came to Gulf on June 1st, 1946, Stan Pearson and myself were sent out to the field shortly after and came back in October. For the next few months we worked up the field work that we mentioned earlier, up in the Peace River area, Wapiti River area and I recall him pushing him to move faster. I had been working with the government where you had til next field season but we finished that, a pretty good report and I think it's still a good report. Then started the active sub-surface work, the seismic work had been going on, then started the drilling in Pincher Creek at that time, that's now '47 and '48 and Stettler area and the work that went before that. We were a small company then and I was the second geologist hired, John Wantford was hired in the spring of 1947, Jimmy Bryant was the other geologist, so we had a bout 3 geologists when the active pre and post Leduc period started.

BC: And how old would Mr. Lockwood be at that time would you think?

OE: I would have thought he would be in his early 40's but . . .he was very secretive about his age and very few people knew his age. That was a very closely guarded secret. He lived very closely with his wife and in terms of. . they did not seem to have much of an outside social life, he seemed affable to everyone, at lunchtime we would say what a lovely affable boss we've got, good humoured and he was all that. But he also had another side to him that we that worked under him respected and understood and that was that he was diligent, conscientious and very concerned about finding oil. We didn't dictate our holidays because the oil finding came first as I recall.

#068 BC: How long was he manager, when did he leave Gulf, or did he go somewhere else?

OE: Those are the dates that escape me.

BC: Did he stay with Gulf?

OE: He stayed with Gulf and later on, some years later, I can't remember the date, he was transferred to the Toronto head office as advisor to the executive. He worked out of there until he died and that date I don't recall either, it was some years ago.

BC: Who took over from him then, who became your next boss?

OE: Stan Pearson was our next Exploration Manager. He started right after the World War II, with Gulf, one of the returned veterans and he started on the geophysical route and was a graduate geologist from the University of Alberta and was instrumental in starting Gulf's seismic operations in northwest Alberta, where people had not worked in the wintertime before. Stan took the crew out and I heard him tell the story that it was a new experience for everyone, they didn't know they could work at 60 below zero and they couldn't, the machinery would break down.

BC: But they could work at 50 below?

OE: 50 below they could. And the propane wouldn't work, they finally put a lamp under the propane tank and got it pouring again, or got it active again. But he was our next manager for several years, I don't recall the detail of the years and he moved on to the overall manager, at which time I came from Chief Geologist to Exploration Manager and I don't even recall those dates now.

#092 BC: No. Well, of the people, I'm not going to go into details, but where did Mr. Bevel fit in there, did he come after Mr. Lockwood?

OE: Mr. Lockwood was here in the early 40's first, Max Littlefield was here on and off, Lockwood was the permanent man, Littlefield was assigned on short time operations. Bevel was the second manager or agent they sent up here, I did not meet the first one. When I came it was Mr. Bevel, John H. Bevel.

BC: And was he here at the same time as Mr. Lockwood?

OE: Oh yes, exactly.

BC: What was the difference in their positions?

OE: Mr. Bevel, his title was General Agent at one time, Lockwood was Exploration Manager.

BC: What is a General Agent, I've never heard of that.

OE: General Agent was the businessman and they changed that title afterwards I think, to General Manager. I seem to remember seeing that title, General Agent, which meant he was Gulf's man in Canada that did the business work. And he acted as landman, manager, I think you'd call him the business manager.

BC: And this is what Stan Pearson eventually became or was that where Mr. Lophnee was.

OE: Mr. Lophnee became that and Stan Pearson had an equivalent position, Vice-President, I think much an equivalent position, some years later.

#112 BC: I know there were problems with Mr. Bevel and Mr. Lophnee came in. Could you just tell us the way that the transfer was made because it would always be a difficult time when one manager goes and another one comes in.

OE: Yes. Bevel was a very intelligent, clever man and he was able to get money from Pittsburgh for drilling wells. I recall him once saying that I've just approved a well for so many hundred thousand dollars, I haven't got approval yet from Pittsburgh but he always seemed to get it. We were under Pittsburgh at that time. He was a man that was able to bring the directors and President of Gulf Corporation to the Pincher Creek well site. We took a bus and went down there, we had the directors and officers of Gulf Corporation helping push the bus up the steep hill. He was very . . . I can't get the right word for the man, but clever certainly and likeable certainly. Give him credit, with the recommendation from Mr. Lockwood, he was able to acquire a great spread of CPR lands

in the area of Drumheller to practically Redwater, which is still a source of a lot of Gulf's oil and gas in the Stettler, Big Valley area today. In 1951 I had been up in the McMurray area and there was a change of management in September of that year so I recall coming back to a dinner meeting of all Gulf personnel in the Palliser Hotel.

#142 BC: How many would that take in at that time, 11?

OE: No, it was more than that by 1951. It was in the large room and I would think back, it might have been in the order of 100 people. It was quite a large group by 1951. We had several geologists, geophysicists, land people, scouts, plus clerical help, they were all there, every employee as I recall. That was the occasion where the change of management was affected and the new manager Mr. Lophnee was introduced to us. The Vice-President from Tulsa gave a short talk that there are times when companies need to have changes and this was one of the times and he introduced the new manager, E. D. Lophnee, who was our General Manager for some years afterwards. The only comment I was going to say is that it was done so well that one of our men said, he'd never saw a dull axe cut like a razor before and people from the company that I was sitting with, turned to me at one stage and asked me, where's Mr. Bevel, isn't he going to be here. I guess I had a little more background, I said, I hardly think so, which of course was true.

#164 BC: When he left, were there other people in the company that sort of left because of him or was he just. . .he didn't have friends within the company that much?

OE: One or two may have left but I can't recall any more left, they might have left anyway, I can't recall.

BC: Yes. I wanted to ask you about Max Littlefield because you've mentioned his different times and we haven't really taken the time, we must, and you worked quite closely with Mr. Littlefield didn't you?

OE: Yes, I think that is a very interesting story that should be recorded. From what little I know, it may help a bit. I met him first. . . I probably met him in 1943 when I was working west of Rocky Mountain House, met him very briefly, he was studying rocks. But I really met him after 1946 when I came. He was one of the men with oil and gas experience that was sent to Canada on assignments to train our new Canadian geologists and geophysicists, mainly geologists at that time and also to help out in the regional geology of western Canada. His expertise was the Mississippian formations. I'm told by people that know about it, as late as a couple of months ago, that his work was of a nature that he was ahead of his time. In the Williston basin area which is still getting it's. . . again, getting a replay lately and finding more oil, he had been studying the rocks, not the rocks as much in outcrop as in sub-surface in the United States and studied the mountain rocks in Canada. And had come out with reports which were I suspect, many years ahead of his time. He was ahead of his time in another art and that was the science or art of well site geology. I got to know him because he used to train us on the well site because we had no background in well site geology. He mentioned to me that when he came, as a young geologist, on well site work, at that time the drill hands that were doing the drilling, they were operating all aspects of the well. They were calling the shot on everything and when young Max Littlefield came to the well, they tended to ignore him. At that time, the expression would be, you'd either get sand, shale or shells, I imagine that means

sandstone, shale and carbonate. And that was the type of early log that was coming out of the wells in the States as I understood from Max. He did a much more refined job with his geological background and they felt annoyed with a young geologist telling the drilling crew what was going on. He told me they used to put red brick powder in the wells, he would come out with it and say who's been mixing red brick powder with the samples and they began to respect him afterwards. I think dried horse manure sometimes.

#218 BC: But he always could identify it.

OE: He'd always identify it. But it affected his personality I suspect because as long as I knew him and I worked with him on and off for 2 or 3 years in Alberta, he collected his own samples from the shale shaker. I don't believe it's never done now, they've got people who bring it to your door, they did even then. He either didn't trust or he wanted the samples collected the way he wanted them and he had a rule, a very effective rule but it's a hard one to follow. He collected off the shale shaker by himself every 20 minutes, not in all formation but in the critical formations, every 20 minutes or every 3', whatever came later. You can't collect very often in 20 minutes. And I used to watch how he collected and I would say, Max, Can I collect the samples for you and he didn't trust geologists either at that time. But he had to trust other companies logs because he couldn't collect from the data he was studying. I was on a well with him in the Stony Plain area one winter time, the fall of the year, when he was collecting the samples in the critical area, he was sick with the flu, we were both getting very short tempered, I asked him a question to learn something from him and he turned around and said, there must be something wrong with him, nobody can understand him anymore. And I should have said, I can't hear you speak with a cigarette in your mouth, and mumbling after no sleep for all this time, but you learned a lot from him. We never fought but he gave a lot of excellent advice if you were willing to listen but he had certain concerns too. He had his likes and dislikes. I don't think he and Mr. Lockwood ever saw eye to eye, they had a geological argument and I don't think they were any better than professional enemies for the rest of their lives.

#253 BC: What was the argument, do you know?

OE: It had to do with a geological regional theme developing that involved evaporite rocks, I believe and I don't really know I didn't get into it. But coming back to Max's background, after having studied under him and worked with him, he visited me at a well once and I showed him what I thought was a prize log that I had assembled from interpreting the rocks and his comment to me, well, Oscar you're now where we were 20 years ago. A little deflating. . but probably true.

BC: What was it that he had done that was . . .

OE: So detailed, the descriptions of the rocks that were being drilled and not necessarily cores but the samples that he would interpret that he at one time had 80 columns to fill as the well was being drilled, these were the rock types, the accessory minerals, any little thing, he found the fossils even and he would put them under a certain column. He did invent a technique called the Littlefield log, which was very difficult to interpret unless you worked with it all the time. He knew that so when he reviewed the well with management, he would fill in the words. We learned to use the log and I compared it to keeping a bowling score, x's, slashes, dots. . .and these would fit in the columns with the

headings on the side.

BC: Was it then easy to read?

OE: It was fairly easy to read once you got to the main themes. He had several columns for each rock type and x's and dots, it would be a little like shorthand. It was being used by the Gulf geologists for some years but I think they have long since forgotten and don't use it anymore.

#290 BC: Did it assist you more in your exploration work having that detailed a log.

OE: That detailed log. . . I never did. . . at that time promotion came fairly rapidly and once you went from geologist to Chief Geologist you look at other people doing the work and so I saw the logs being worked, I never did any more of the logging in the Littlefield style. Let me tell you a story about Littlefield that will show you what type of man he was. He was a short man and I think that's one reason. . . Mr. Lockwood was a tall man, I don't think that helped their relationship. But he made good coffee in the doghouse on the well if you were a friend of his. And I must have been fairly close to being a friend of his although I couldn't make coffee like Jimmy Bryant could, but one day, New Year's Eve, we were on the well with him and he takes out his purse and shows us a picture of his family, after we had known him for 2 or 3 years. So that's the type of person he is. And one day he told me. . . I don't know what we were talking about but we saw quite a bit of him. . . that we all knew the expression, I think it was Mallory that climbed or tried to climb Mount Everest, they never know if he made it but he came very close. I think in 1924 was when he was lost but between the various attempts he must have come to the States because we had all heard the expression, somebody asked Mallory one time, but why do you want to climb the mountain and his well known answer, "because it's there". Well, we were talking about something one day and Max Littlefield said, I was there when he said it. This must have been in the early 20's when Max was a student at Aimes, Iowa and Mallory came through and gave a talk at the University. . . I assume that. . . so it was interesting to have heard the man state what I had heard or read about earlier.

#330 BC: did you find that you learned a great deal from Mr. Littlefield?

OE: Yes, I learned a lot because I had a lot to learn, mainly on sample interpretation. He didn't teach as much as work, he worked all hours of the day and night. When he came to Calgary he would want some samples in the hotel room and a microscope and we wouldn't see him. He did a lot of the work by himself and he would come up with a log interpretation or a recommendation.

BC: And was his word law?

OE: He wrote letters directly to the management. I'm afraid some of those letters and reports have been misplaced or lost today unfortunately. He had worked out the Pincher Creek story to more detail than I think it's ever been done before or after from the samples and cores. He was a dedicated man, Lockwood was in another way, in terms of getting land and exploring for land. Littlefield was a dedicated man when it came to the rock. And I'll tell you how dedicated. I've heard him say at a meeting, I'll argue with the man who's looked at the rock and he knew he was about the only one who had really looked at the rock. Another time he came in with a bandage on his finger, about a 6" bandage keeping his finger straight, he had broken his finger. I don't know if he wanted to tell us how he

did it or we learned how. He was dedicated and worried about nothing was done to change the core as it was pulled out of the well at Pincher Creek or Stettler or Redwater. I think it was at Pincher Creek, this 4" core, rock weighs a lot more than water and 20' long or 10' long, in that order, up to 30'. There are clamps that hold the core in place and as the drill crew were pulling out the core, the clamps that hold the core in place began to slip and the core began to fall out on the rig floor which can. . .it comes out in pieces and it might get disrupted and turned end for end and lost and he, without thinking, put his hands underneath that core to try to hold it up in the barrel. There's no way you can hold a ton or whatever it is. He was lucky.

#385 BC: For goodness sakes, he was lucky that he didn't have a crushed hand.

OE: Yes he was. He treated cores practically in a sacred way because that was the information from the bottom of the hole at 12,000' at Pincher Creek. And the information was there, if you didn't change it or disrupt it. I didn't realize this, normally and they still do it today, when they take a core out, the drill hands take a spray of water and clean all that gunky mud off of it. He did not permit that. He wanted the core as close to the original rock as possible and he ran the show.

BC: He felt that if it was washed off you might wash some information off?

OE: Wash some information off, lose some information. Or introduce some. So his technique was to take the core and put it in labeled core boxes and wipe it only with wads of rags, paper, and then study it that way. That was how he used to be and I don't think he ever changed.

BC: How important do you think he was in the early work here in Canada?

OE: His work was mainly two, he was a Mississippian expert which is the rock which produces from Pincher Creek, all along the foothills, Turner Valley, Jumping Pound and north. And his studies were mainly Mississippian. I've seen very few. . .there were some company reports out there he made on that and they were regional ones. So I wouldn't be surprised if he had a hand in recommending Gulf come up to Canada because there are good looking rocks exposed in the foothills and the cores that he had seen at Turner Valley that give good opportunity for Gulf to operate successfully looking for gas and oil in the foothills. The other part that I remember him as much for is training of the early Gulf geologists, Stan Pearson, John Wantford, myself and Jimmy Bryant were all trained by Littlefield. And that training then, from what we learned from him and gathered ourselves, we had to train others.

#436 BC: You had to train on, so he really did give a very solid foundation to Gulf Canada then?

OE: Gulf Canada and he helped other companies. I mentioned he was short in stature and there was a man in Imperial Oil, Doug Lair and they were the best of friends. Whether they were both had the same personality or what but he would spend a lot of time at Imperial offices. I was told that he was a world expert on Carbonate rocks which are limestones and associated rocks and he would be sent anywhere in the world, he worked in Denmark, he was sent to South America, Venezuela, where Gulf operated with Exxon people. When you're in a local office in Venezuela and a stranger comes from another office, you tend to disparage him possibly, so what he did, he wasn't welcome in the Gulf

office I'm told so he went over to the competitors office and worked there, helped them. Not really a competitor, they were actually a partnership in Venezuela. So he helped and if Gulf didn't listen the other companies did listen.

BC: Was he a consultant or was he a Gulf employee?

OE: He was a Gulf employee and he died a Gulf employee, retired first. He told me he wanted to retire, I got to know him fairly well, I think during Christmas holidays. . well, it wasn't a holiday for us. . .long 24 hours a day on call on wells, he began to talk. He told me he wanted to retire and grow a special type of grass that was good for eastern United States. I don't know if he ever did. But he did retire in the eastern United States and has since died and no proper obituary has ever been written. I was asked to help make one up. I sent my portion in to friends of his in the States, we still talk about writing it up. . .

End of tape.