

PETROLEUM INDUSTRY ORAL HISTORY PROJECT
TRANSCRIPT

INTERVIEWEE: Jack Porter

INTERVIEWER: Jim Wood & Nadine Mackenzie

DATE: 1984 & Mar/Apr 1985

JW: . . . 1984. I'm in the office of Mr. Jack Porter at Canadian Superior in downtown Calgary. this is tape 1, side 1 of the first interview with Mr. Porter. My name is Jim Wood. Jack, I thought it might be interesting to begin this interview with some historical background on the petroleum industry in Saskatchewan and more generally, perhaps, in North America. As you mentioned, this might take us up until about 1940, or more or less the time that you got personally active in the business and at that time, or rather, in a subsequent interview then, we'll pursue some of your own personal biographical data and your own experiences in the industry. So perhaps we could go back to the beginning. You mentioned you wanted to go right back to Ontario and Petrolia.

JP: Yes Jim. This little prologue will probably introduce the first commercial interest in petroleum. Prior to 1855, petroleum, it was referred to in the States as sinica??? oil, was used essentially for medicinal purposes and there wasn't any significant demand for it as a fuel. The first discovery of commercial oil in North American is dated August 1859, at Oil Creek, near Titusville, Pennsylvania, by a well which was drilled by Colonel Drake. He obtained production at a depth of 69½' and the well produced approximately 35 barrels a day. This well was located at that time, near an oil seep or an oil spring as it was referred to. The subsequent years, up to about 1862, during the Civil War, the area became extremely active. Concomitant with this period in Ontario, and to a lesser extent in New Brunswick, there was some exploratory drilling for petroleum. It's been documented that, as early as 1859 a number of wells were drilled at Dover, New Brunswick, again, based on oil seeps in which some oil shows were found but they were non-commercial. Predating the Drake discovery a man by the name of J. M. Anderson drilled some wells at Petrolia, Ontario, in the period 1857-1858. Again, drilled on oil seeps and discovered oil which subsequently became commercial. The question arose whether these wells Anderson had drilled were actually hand dug wells or whether they were drilled with a pull type cable tool rig. It's subject to a lot of controversy as to whether the Americans or Canadians were first responsible for this accomplishment. One significant note of interest which predates this discovery was the work done by Sir William Logan. He was the first founder of the Geological Survey of Canada. He reported as early as 1844 at Gaspé, at the mouth of the St. Lawrence River, the occurrence of oil seeps which were associated with anticlines or folded strata. This observation was extremely significant and probably the most singularly important hypothesis in the habitat of petroleum.

#044 JW: Did this have implications down in the United States as well in terms of what later

went on at Spindletop and . . . ?

JP: Oh yes. This hypothesis was in existence for, at least the anticlinal theory was the focal point for all exploratory drilling at that time. The concepts of stratigraphic traps or facies or biogenetic traps or complex faulted traps hadn't been thought of at that point in time. Moving to western Canada, there was some activity in the 19th century. Roughly in that period I've been speaking of between 1874 and 1900. The first well that found shows of natural gas was located at Fort Pelly, and a well was drilled in 1874 and 1875 by a Mr. Fairbank of Petrolia, Ontario. This well was drilled for a water supply for the fort and it was drilled to a total depth, at that time of 521' utilizing probably a fairly primitive pull type cable tool rig. It encountered gas at 259'. This gas, it was essentially methane gas from analysis, or what the geochemist would refer to as biogenetic or immature gas. Following that period when the Canadian Pacific Railway was built across western Canada. Again, the railway were looking for water supplies along the right-of-way and the first natural gas, again which was serendipitously discovered was at Langevin, in souther Alberta. This was in 1883. The actual gas was utilized by the Canadian Pacific. Some 7 years later, 1890, a company drilling for coal at Medicine Hat again uncovered, in their search for coal, they uncovered gas. As early as 1880, again, coal was being explored for by the Dominion government through the Geological Survey and a well was drilled at Roshcarseed???, down near Estevan, Saskatchewan. Again, a pull type cable tool rig was used and the information from these well was documented by the Survey at the time and today you can read the lithologies described in these old journals. Now besides the railway and their exploration for water supplies for their steam locomotives along the right-of-way, as well as they were looking for coal as well, the Geological Survey of Canada had a rig, again, it was a cable tool rig and it was activated by a wood burning steam engine. They used this rig essentially to look at the extension of the tar sands which were examined by a Dr. Tyrrell, at about the same period, around 1885. The Geological Survey of Canada drilled 3 wells in the vicinity of the tar sands. They drilled on up on the Athabasca River at Athabasca Landing in 1895 and they didn't reach the tar sands. They drilled another one at Pelican Rapids about 60 miles maybe, southwest of the existing tar sands and in this particular well they actually encountered the tar sands and probably that was the first bona fide oil that had been uncovered in western Canada, albeit it was bio-degraded or heavy oil, at least, you couldn't produce it. And again, northeast of Edmonton in 1899 the same rig was used to drill a well in exploration for the tar sands and the well bottomed out at depth just some 200' above the tar sands. During the early part of the 19th century, particularly in the period around 1912, just pre-dating the First World

#096 War, there were a number of wells, about 28 wells were drilled in Saskatchewan and Manitoba at the time. The railways, the Grand Trunk Pacific, the Canadian Northern, which later became the Canadian National in 1917, the Canadian Pacific, all drilled wells at stations along the right-of-ways. There were wells drilled at Camsack, Sask., Maclean, Sask., Bell Plain, Sask., Langham, Sask.,. There were wells drilled at Deloraine and Neepawa, again, in exploration not for hydrocarbons but for water supply. Following the Dingman discovery at Turner Valley at Sheep Creek in 1912 it set off a flurry of exploration in western Canada, albeit it was negligible??? compared to the exploration that was to follow in the post Leduc period. Companies were formed, usually in

communities, towns and cities, such as the Saskatoon Oil and Gas Co., the Maple Creek Gas, Oil and Coal Co., the Estevan Oil Co., the Western Natural Gas and Fuel Co., and Saskatchewan Exploration and Development Co., Mackenzie and Mann and various entrepreneurs that drilled wells primarily for, their objective was to discovery oil or gas. Likewise there were a number of wells drilled in towns essentially, by interested farmers. The wells by today's standards would be very shallow wells that really only got down to depths in the range of 500' plus or minus.

#120 JW: Well, a person drilling a water well could very easily just switch his emphasis to oil or gas primarily anyway.

JP: That's right. As again I mentioned, most of these wells were drilled in the period 1912-1930, pre-dating the Dingman discovery. Through this period no commercial oil or gas was found, although some minor gas was found but no commercial oil was found, with the exception of the activity in the Turner Valley area. There were oil shows reported in the old logs of the wells but probably they were spurious in as much as they were reported by drillers. Technical people, geologists or engineers, weren't utilized at that time in the exploration for many of these oils. They were essentially promoters who were probably more interested in making money than actually finding hydrocarbons. Most of the wells that were drilled by these promoters were often drilled on the basis of oil seeps, in which water wells, which they thought they observed fluorescent or oil colourations as a scum on the surface of the water wells. In nearly all cases these so called shows or seeps or stains, they were the result of iron oxide. They were absolutely no clue as to the existence of hydrocarbons. As early as 1914 a book was published entitled, Oil Prospecting, Drilling and Extraction by F. J. S. Surr, who presumably was a mechanical engineer and a consulting geologist. This book was published in Calgary, Alberta. Obviously in perusing it, it contains a lot of rudimentary geology about western Canada as well as the habitat of oil and the technique in drilling with cable tool rigs. The concept of the Williston Basin was documented as early as 1933. That is, a term to describe an interior sag on the sediments on a crakon??? and it was mentioned as early as 1933 by 2 geologists, Dobbin and Erdman, in an American Association of Petroleum Geologists text. This is the first instance of the use of the term, Williston Basin and it is referred to because they felt that they town of Williston, North Dakota marked the middle of this basin. Prior to that time this area, including Saskatchewan and Manitoba, the Dakotas, central and eastern Montana, as well as Wyoming were referred to as the Dakota Basin and it was defined on the basis of the actual aerial extent of the Dakota sand, a lower Cretaceous sand which circumscribed the basin. It wasn't until the early 40's that the term, Moose Jaw Syncline or Moose Jaw Basin was the term used in Canada for that portion of the Williston Basin. Apparently this term Moose Jaw Syncline was coined by Cam Sproule when he was operating out of Moose Jaw, Saskatchewan. Probably why he used the term Moose Jaw Syncline or Moose Jaw Basin, it was to distinguish it from the Alberta Syncline or the Alberta Basin at that time. Subsequent exploration in the 1950's saw the term Williston Basin supercede the term Moose Jaw Syncline and that term is now lost in the literature.

- #186 JW: Jack, in your discussion of some of the history of oil well drilling, especially in the earlier years prior to 1930, how would you characterize, especially in Saskatchewan, the nature of the drilling activity, in terms of a theoretical base or a scientific methodology? What was the approach do you think, in general at that time?
- JP: Jim, I believe there was very little scientific application to exploration for oil and gas at that period of time. Imperial Oil had drilled at least 2 wells, one at Boundary Lake and one right down near Govanlock???, in the extreme southwest corner of the province.
- JW: That's of Saskatchewan.
- JP: In Saskatchewan. As well as one up at Muddy Lake, up in west central Saskatchewan, near the Alberta border. I know that the well at Boundary Lake, at the border, was based on a fault type closure anomaly. It was the result of a surface geological . . .
- JW: Okay, Jack, you were mentioning an Imperial well up at Boundary Lake, what year was that, do you recall more or less?
- JP: The well was known as Imperial Boundary #1 and it was spudded in 1916. It was located in proximity to the Montana border in extreme southwestern Saskatchewan. As I understand when I worked for Imperial Oil this well was drilled actually on the expression of a surface fault as a result of surface geological work that was done by Imperial at that time. Likewise a well was drilled up in west central Saskatchewan known as Imperial Muddy Lake, which was spudded in 1919 and abandoned in 1920. I don't know on what basis this well was drilled. Certainly the area is covered by glacial drifts and there would be no clues as to either the structure or the lithology of the buried section. Certainly at this period of time the seismograph and the magnetometer type of reconnaissance surveys, which came into vogue in the late 20's and the 30's, were not used in western Canada at this period of time, at least not to my knowledge.
- #225 JW: One of the things that was used a lot was dowsing though, wasn't it?
- JP: Dowsing was used a lot. I recall that when I started to work with this company as early as 1948 that there were actually professional dowzers in my office claiming they could locate the position of oil. Both as to its location and the depth to which it would be found using these questionable instruments. There was one anecdote that up at Camsack, and the story that was related to me when I was doing some work on the gas reserves at Camsack during late 1947. I was told that a dowser had used a cigar box with a bull frog in it with batteries and a button concealed underneath that he would press resulting in a slight shock to the bullfrog. The jolt of the box would determine the position of the well to be drilled. Also, during the early exploration at Lloydminster, Saskatchewan, there were dowzers who claimed that they could locate deposits of oil by using questionable instruments. Sometimes they claimed they were purely psychic. This one fellow who claimed that his psychic powers were directed to the location of hydrocarbons, it was reported that Professor Edmunds at the University of Saskatchewan who was associated in a consulting capacity with the exploration of the Lloydminster oilfield had several 5 or 10 gallon drums of crude oil buried in an area east of Saskatoon. It was up to this fellow

to locate them and apparently he didn't meet with any measurable success, so the story goes. But dowsing has been, just as its been used over the centuries in the location of so-called, underground water streams or underground water lakes, this application has been involved within the mineral industry and with the oil and gas. It was unfortunate because a lot of promotional companies utilized such individuals in their search for oil and gas.

#272 JW: In your review of Saskatchewan drilling activity up until say, about 1940, this is actually based on a fair bit of research you have done. I wonder if you could just talk for a minute about some of the sources that you have used in your historical pursuits and what's available and where some of these things are.

JP: One of the most valuable are the schedule of wells that were prepared by the various provinces. I can refer to the Alberta Petroleum and Natural Gas Conservation Board schedule of wells drilled for oil and gas to 1947. There's even an earlier one. Probably the first one that was just in a type written hard backed manual, for the province of Alberta, it refers to a schedule of gas and oil wells compiled December 31st, 1930. Although I gather some of the material in this particular volume has been incorporated in the schedule of wells drilled for oil and gas to 1947. Likewise the Saskatchewan government has issued a series of schedule of wells. Probably the first one that came out is the Department of Natural Resources schedule of wells drilled for oil and gas to 1950 in Saskatchewan. Now the Geological Survey of Canada in a series of . . . well, actually since its inception, around 1844, I'm not quite sure of the date but the various officers or geologists with the Survey prepared progress reports each year. I've used them back, for instance the reference to the Fort Pelly well are recorded in the volumes dated 1875, '76. Through the exploration of geologists in western Canada, they noted any occurrences to any type of wells that were drilled and the result, just as they were interested in both the surface outcrops, they were equally interested in the results of boring. I can refer to probably the first documentation of compilation by the federal government of oil and gas wells. It's incorporated in a 2 volume report, the Petroleum Natural Gas Resources of Canada. Part 1 deals with eastern Canada and part 2, western Canada. They were printed in 1915, Canada Department of Mines, through the Mines branch. The compilers were Platt??? et al. In 1919 the Geological Survey of Canada put out memoir 116, entitled Investigations in the Gas and Oil Fields of Alberta, Saskatchewan and Manitoba, by Dow???, Slipper and McLaren. It's an invaluable source of information on the early wells.

JW: That's a pretty battered looking copy you have there. I suspect that's not generally available any more.

JP: No, some of these copies aren't, particularly this one. But certainly the Geological Survey of Canada's office in Calgary or Ottawa would have copies of these. I understand they have a complete set of all their reports since the inception of the Survey.

JW: Jack, I'm going to have to turn the tape over right now.

JP: And again, the Geological Survey of Canada put out a manual, Natural Gas Reserves of Prairie Provinces. It's by Hume and Ignatus and it's dated Ottawa, 1948. There was a subsequent one put out in 1950. These volumes give detailed accounts of the gas fields which were discovered in western Canada to the dates mentioned. The American Association of Petroleum Geologists have published a number of memoirs or symposia. One symposium is titled Problems of Petroleum Geology. It's the Sydney Powers Memorial volume and it's dated 1934. It's edited by Rather and Leahy. A subsequent one, memoir 6, entitled Trek of the Oil Finders, A History of Exploration for Petroleum. In Calgary here there's probably the Alberta Glenbow Foundation is a fine repository for both photographs and documentation of exploration in western Canada. As well as the rare books and special collection section of the library on the campus on the University of Calgary.

JW: I understand the CSPG maintains their archives there, is that correct?

JP: Yes. I've been responsible for the collection of all material relating to the history of the Canadian Society of Petroleum Geologists, which was formerly known as the Alberta Society of Petroleum Geologists and which was founded in 1927. And the original correspondence dating to the founding meeting and subsequent material by executives, publications, in formation relating to conventions, it's all housed at the ??? special collection series Jim.

End of tape.

Tape 2 Side 1

NM: This is Nadine Mackenzie speaking. This is the second interview with Jack Porter.

JP: Thank you Nadine. I thought this morning that perhaps I'd give a little prologue on some pre 1940 highlights in the exploration directed in the Williston Basin area of Manitoba and Saskatchewan. The first well to be drilled, actually in the western Canada basin was drilled about 8 miles north of Fort Pelly during the season 1874, '75, by the Dominion government. The well was located primarily to ascertain a stratigraphic section to see whether coal was present. Coal had been observed in outcrops in the disturbed belt of the foothills of Alberta and the Survey were interested to see whether coal had extended that far east in the plains area. Between 1874 and the pre-war years, that is 1939, approximately 164 wells were drilled in Manitoba and Saskatchewan during that period. About 125 had been drilled in Saskatchewan and some 39 in Manitoba. Probably all these wells were drilled with the standard cable tool type of drilling, perhaps with one exception. One well had probably drilled by rotary drilling and this still has to be verified. It may have been spudded with a cable tool rig and later finished with a rotary rig but it was a well drilled at Avonlea some 38 miles south of Regina in 1933. It reached a depth of some 4,363' which was a relatively well for a well to drill at that time. Most of the locations for drill sites by companies that were interested in exploration for coal, or in particular gas or oil, was based on seeps and for the most part were fairly unscientific. Many of the springs and the sloughs and water wells on the prairies contain hydrogen sulfides, which gave a fluorescence, not unlike oil. This often led speculators to drill at

these sites. There were many such reportings of "oil seeps" and they turned out to be the iron sulfides in the well. One of the tests that were used at the time, if a stick was poked into this sheen or fluorescence of evervesence of rainbow colours on the surface of the water the iron sulfides would fragment, not unlike ice breaking up, rather than coalescing like oil. This was a test which geologists used at the time to differentiate between which was a bona fide oil show and which was actually a mineral occurrence of sulfides. During this period there were really thrusts of exploration. The railway companies, that is the Canadian Pacific and the forerunner to the Canadian National Railway, that is the Canadian Northern Railway and the Grand Trunk Pacific. . . the latter 2 merged in 1917 to form the Canadian National Railway. But the Canadian Northern, the Grand Trunk Pacific and the Canadian Pacific all drilled wells in certain divisional points or stations along the right-of-way. Their primary purpose of course, was to obtain water for their locomotives. So a lot of the early wells, they weren't drilled to any exceptional depth, maybe depths up to 500' or some were drilled a little deeper.

#054 NM: Did it happen sometimes that they would find oil?

JP: No, but they did find gas. I think the first gas to be found in southern Alberta here was found on the CPR right-of-way, it was Eldershire. . . I just forget the name of the town but the very first gas was found serendipitously when they were searching for water actually.

NM: So it was just by luck.

JP: That's right. The same thing when companies were drilling for coal in the Medicine Hat area they discovered natural gas. The second thrust was made by the Dominion government through the Geological Survey of Canada. In conjunction with surface geological parties they attempted, just as they did in 1874, '75, to drill wells in the glacial covered prairies to determine the nature of the bedrock below the drift and the stratigraphic succession. Also they were interested in all types of mineral currents, whether they be salt or gas or oil or coal. Of course, the third thrust was made by speculators, small oil companies. I believe the first one was formed in 1888 in Manitoba. It was either Pembina or Vermillion Oil Co. in which monies were raised to explore for oil and gas. Surprisingly, most of these companies, whether they were formed in Saskatoon or North Battleford or Maple Creek or whatever the town they were formed in, often they referred to the Saskatoon Gas and Oil. In other words, the gas seemed to set precedence over the oil at the time.

NM: Because that was the first thing they could find.

JP: Yes, that was the first thing. But probably there was a greater demand for, they seemed to be interested in the gas. And also coal, the term coal was incorporated in many of these titles where they were interested in coal as well. Of course, all these companies, most of their locations were based on some type of unsubstantiated show of gas or oil. There was a certain degree of quackery involved, there were psychics involved, there were dowzers, all types of individuals that these so-called experts, they were promoters that were attempting to raise money to drill these ventures. Many of them failed and the wells only got down a few hundred feet. Suffice to say, of the some 164 wells that were drilled in the Williston Basin portion, that is Manitoba and Saskatchewan, many were less than 300'

deep. Many got just below the drip. There were some significant wells. Interesting, the deepest well, there was a well drilled at Esland, down in the general Regina area in 1910 which reached a depth of 2,425'. Imperial Oil drilled 2 deep wells just during the early part, during the war years. Imperial Boundary was drilled in 1916 to a depth of 3,963'. That was the deepest well up until 1933, when a well was. . . by the way, this Imperial Boundary well was drilled right down on the Montana-Saskatchewan border. It probably was the first well in which some technical or scientific basis was used to drill the well. This was based on surface geology in which some faulting was involved, faulting that was expressed in the Cretaceous rocks at the surface. A deep well was drilled at Avonlea in 1933 which I've mentioned earlier, it went to a depth of 4,363'.

#097 NM: So that was very deep at the time?

JP: This was an extremely deep well and it may be that this was the only well at which a rotary rig was used to drill. The well was drilled just within a year and it remained the deepest well during this period of time, from 1874 to 1939. One well was drilled up in northern Saskatchewan in 1933 which only went to a depth of 1,085' but it did reach the lower Paleozoic formations and it was significant in as much as many of these wells in south-central Saskatchewan, although they were relatively deep at their time, they only bottomed down in the lower Cretaceous or into Jurassic rock and they didn't encounter the deep Paleozoics. This other well that I mentioned, Trail Blazer, was drilled up on the peripheral edge of the basin in which the Paleozoics were at a much shallower depth. One other interesting well was a well that was drilled in the town of Moose Jaw by an unnamed corporation, which was drilled during a long period of time between 1913 and 1932. This well reached a depth of 3,419'.

NM: That was quite deep too, for the time.

JP: Quite deep at the time. The interesting thing was this well encountered, within the Jurassic sequence, a series of slightly saline high temperature water. Waters that were in the realm of 81-91 degrees Fahrenheit. And a pool, which is still in existence today, known as the Natatorium, was constructed in 1932, an indoor warm water pool in which this warm water. . .

NM: How convenient.

JP: Yes. It turns out that in terms of commercial oil and gas during this long period from 1874 to 1939, the first gas that was probably found, notwithstanding the original Fort Pelly well. . .the Fort Pelly well may have encountered a zone during the 501' of bedrock that it drilled through, it may have encountered the zone that produces gas at Camsack, Saskatchewan. So-called biogenetic low pressure gas. But it isn't substantiated in any of the drillers reports. However, we know that a well that was drilled at Maple Creek in 1909 reached a depth of 1,860' and this well encountered, at relatively shallow depths, thick coal beds, at least 2 beds, 6 and 7 feet thick and at around 1,100' it encountered natural gas. This gas appears to be coming from the Milk River sand, which is the productive pool of the Hatton field which lies to the west of this area straddling the Saskatchewan-Alberta border. So it was the first gas, non-commercial gas but it gas was found in this well. At Lloydminster a deep well, Lloydminster #1 in 1934 discovered a

large flow of gas. I don't believe it was utilized until the early 40's. Camsack was an area in which gas was discovered in 1937 at a very shallow depth, at around 200'. It was low pressure biogenetic gas. The gas was used to heat the town of Camsack or some of the commercial business enterprises. This was an interesting period because the basis for drilling at that time was motivated, not so much by geology but purely by promotional interest. I spent some time there in 1947 when they were drilling some of these wells and dowers were involved. There was one, I heard, I did not see it, one fellow that had used a so-called black box that was battery operated with a mouse in it and he'd activate a button to cause this mouse to cause the box to vibrate, to jump in the box and of course, he would indicate that this was a favourable spot to sink another well.

#163 NM: Did people really believe that?

JP: I think they did. There was a fellow there by the name of Fry, a Cuban geologist, so-called geologist, who was involved. Although there was one very respected geologist, Professor Harry Edmunds from the University of Saskatchewan who was involved and he recognized the limitations of drill sites at the time, because what they had considered as anticlines or geological folded structures in the area were none other than glacial features. They were like gigantic loaves of bread, they were symmetrical mounds that, to the untrained eye, appeared to be geological structures. Many of the wells were drilled on the crestal position of these structures. These promoters took advantage of this. There was one other story that I recall when I went there, that a well was drilling a relatively deep well and it was a cable tool well, that the parties involved didn't have enough money to drill the well and pay the drillers and they would sell stock right at the drill site. There was a story that a fellow would stay out on the road and when a car would go by, a Sunday afternoon drive with the family, that he would pull a rope that was connected to the drill site, one of the drillers legs, and they'd start up the operation and they would give an exposition to the interested visitors on a Sunday afternoon and at the same time attempt to sell them some stock.

NM: So they put on a good show.

JP: Put on a good show. And this is a story which I couldn't verify but it was one of the stories that was involved in this area, up in this part of the country. The area of Camsack was a Doukhobor community. Many of the wells were drilled on farms by the Doukhobors, they were Leiboff's and Stushnoff's and Karamakoff's and Popov's. They were truly wonderful people. At the time I worked up there they were most generous to me and I did acquire a fabulous appetite for their Borscht. One man, Stushnoff, actually had used the natural gas from one of these shallow wells to run a machine shop. He was a most ingenious man and certainly had mechanical engineering proclivities. He ran the house, the light plant, all these machines and he ran the natural gas into an old Model T Ford to generate electricity for all his ??? machine shop.

#201 NM: Very clever. So the Doukhobors did not object to people working on their land?

JP: No, they didn't Nadine. No, they didn't at all. They were most cooperative.

NM: That's interesting because I was told that sometimes in Alberta the farmers were quite

upset.

JP: I'm sure but no, they didn't. I know that at the time I went up there on behalf of the Saskatchewan government to measure the gas reserves in the Camsack field. To say the least it was a rag tag field. The welding had been. . . or joints in the distributing pipe to the town, there were leaks, it ran across farm fields and you could detect the leaks by seeing the barren areas in the wheat field. The natural gas would kill all the wheat and there would be a big bare spot, like a large sword. I recall that where the gas pipeline traversed the river, just on 2 tripods, I think in that area it's the Swan River up at Camsack, so it's a small river there, but the sag in the pipe across the river caused it to leak at one of the joints and someone had wrapped a pair of longjohn white underwear around the crack in the pipe to stem the gas leak. Anyway, carrying on, at Unity, Saskatchewan ??? in 1944, gas was discovered in the Unity or basal Cretaceous sand. This small field, the gas was used, it was piped in 1946 to the town of Unity, Saskatchewan. The significant oil discovery during this time, between 1874 and 1939 that was made in the Canadian portion of the Williston Basin was actually just on the Alberta side. Lloydminster Royalties, in 1939, drilled a discovery well in the lower Cretaceous, the heavy oil in the general Lloydminster area. As a result, activity was generated, particularly in 1943 on the Saskatchewan side. Many wells were drilled in the 40's at Lloydminster and I spent some time up there in which we can elaborate on a little later, on the activity during the 40's in Lloydminster. It was at this time that the Husky, from Cody, Wyoming, who had been producing heavy oil in the Bighorn Basin in Wyoming moved up to the Lloydminster area to take advantage of the potential of the heavy oil. In 1947 they built a small refinery that would handle 25,000 barrels of oil a day, processing this heavy asphaltic crude from the wells that were drilled there. Perhaps that will end my little prologue on the backdrop to the activity that occurred during the 40's in the Canadian portion of the Williston Basin.

#250 NM: Mr. Porter, could you give me some background on yourself, when and where were you born?

JP: Nadine, I was born in Saskatoon, Saskatchewan in 1922 and my parents were originally from Newfoundland. My father came out in 1906 to western Canada. He had worked both in Manitoba, Saskatchewan and Alberta. He joined the Army in the First World War in Calgary here with the 10th Battalion, had gone overseas, returned back in 1919 and married his childhood sweetheart, my mother. Her name was Bertha Foresee???, she's the first cousin of Senator Eugene Foresee. She had been a nursing sister in France during the First World War. I think she was the only nurse from Newfoundland that had . . . Newfoundland was a colony at the time. She had joined the Queen Alexander Imperial Forces, which was a nursing regiment in England at the time. Anyway, they were married in Newfoundland and came back to Saskatoon in 1919. There were 4 in our family, I have an older sister and an older brother and a twin brother. My childhood was spent, a great deal of it was spent along the river banks in Saskatoon, fishing as a youngster. I had an insatiable curiosity about rocks and pebbles in general. The river bank was strewn with glacial drift that had been washed and there was a heterogeneous assortment of every conceivable type of rock, sedimentary, metamorphic, igneous rock. There were even

fossils in some of these rocks. As a cub and a boy scout in the early 30's south of Saskatoon in the sand hills, when the top soil was stripped off, I was very enthusiastic about collecting Indian artifacts, particularly arrowheads. So naturally I did have this curiosity and it was a labour of love falling into something like geology. I attended the University of Saskatchewan and graduated in geology in 1946. Went back one other year and was an instructor in geology during the post war period. At the time at the University of Saskatchewan, there were just 3 professors there, Jim Mobsby, who was head of the department, Harry Edmunds who was another professor and Rod Byers, it was a very, very small geological department.

#298 NM: Do you remember other students?

JP: Yes.

NM: And later on you met them again or you worked with them?

JP: Yes. In my class Jack Usher, who I worked in the Geological Survey up in Entrance, Alberta in 1943. He later was to become a professor of geology at Queens University for many, many years. He died 2 years ago in California. The other colleague of mine was Ray Thorsteson, the noted Arctic explorer and geologist who is with the Geological Survey. We grew up together. There were other fellows that worked for Imperial Oil, Ken Matheson, I think he's retired now. The classes in those days were relatively small and the organization in Saskatchewan, the geological society was known as the Ore Gang. I note on your list of people that you'd interviewed that many of the geologists were Saskatchewan members of this Ore Gang. Some that predated my tenure at Saskatchewan.

NM: What about your summer jobs while you were at university?

JP: In 1943 was my introductory to field geology. I obtained a position with the Geological Survey of Canada. A geologist, a Dr. A. H., Art Lang, was the party chief, a 4 man party. The area of investigation was between Hinton and Entrance and Broulee, in the eastern foothills, along the Athabasca River.

NM: This is the end of the tape.

Tape 2 Side 2

JP: Nadine, the general area again, was the Hinton, Entrance, Broulee area of the foothill belt where it traversed by the Athabasca River. It was the route of the Canadian National Railway. Our headquarters was at Entrance, it was the outfitting point. The party consisted of, of course, the party chief, Art Lang, R. A. C. Dick Brown, and J. L. Usher. Dick Brown was the senior assistant and Jack Usher and I were the student assistants. We had a most interesting summer. The world entailed really, plane table, alidade stadia work. The Topographical Survey of Canada had gone through earlier and had surveyed the area with a series of benchmarks. We tied our traverses into these benchmarks. Most of it was survey work, although in accessible areas we had to go by foot, in heavy bush or windfall timber. We used a type of survey which was designated utilizing a compass and a pedometer or pacer. We would go from point A to point B using a direction of a

compass and ticking this manually, our paces off.

NM: And you were on foot, were you using horses sometimes?

JP: We had pack horses that summer and we had canoes on the river. The river was very high for most of that season and we didn't use our canoe much but we did use the pack horses in accessible areas. We lived in tents, we didn't have sleeping bags, we lived on pine boughs with Hudson Bay blankets and it was a very damp, in the early part in June and July there was considerable rain in the Athabasca valley. We had a most enjoyable season, we covered a big area and met with some of the oil companies that were operating at the time, notably Shell Oil Co. would come in. Dick Brown was a noted palaeontologist and at this period of time Nadine, little was known about the subsurface in the western Canada basin. The knowledge of the foothills geology was to extrapolate the age of some of the rock systems beneath the plains area.

#032 NM: So it was really pioneer work.

JP: Yes it was. And the parties, not only Shell but at the time, Superior, Nick Nicholls and Art Feldmeyer, they were out in the foothills that summer, or perhaps '44 and '45. They were also looking for favourable geologic structures. In other words, they were looking for Turner Valley type folds that existed to the northwest along the foothills belt and they are still doing that today. At any rate, the Shell parties, and I met that summer Jim Scott, who you interviewed I think, he was working with Shell that summer and he was one of the geologists that visited our camp to get some fossils identified. One of the interesting anecdotes, in this area, it was during the war and there was a Canadian National Railway trestle bridge, a high trestle bridge that crossed I think it was, the Prairie Creek or it may have been Maskuta Creek. Because of the fear of sabotage, in particular Japanese sabotage they had guards posted on either side of the bridge. The guards they recruited were ex-policemen, ex-retired Army personnel, all of them bachelors and they had a large hut out there which they did their own cooking. They had search lights on either side of this bridge with Lewis machine guns to prevent any saboteurs from damaging it. I recall there was one old Scotsman, a big powerful built man, easily 6'4" or 6'6" and I think his name was Alec Munroe. He'd been a professional wrestler during the turn of the century, a world class professional wrestler, a Scotsman. He was a most likeable individual. He had a little dog Trixie, a little black sheep dog and he'd demonstrate to us how Trixie could guard the bridge. In his Scotch brogue he'd say, Trixie, go guard the bridge and the guard would run out on the trestle and it would look under every tie and it would cross that bridge and turn around, he'd whistle and he'd yell back. Good training. There wasn't much to do out there, they played a lot of cards and they talked a lot and they were most happy to see us. I remember that Dick Brown had sprained a leg on one of the scree slopes a few days earlier and he had heard that this noted wrestler was there, Alec Munroe again, I believe was his name. Alec afforded him some type of massage therapy that he had learned from his wrestling days to alleviate the pain he had from this sprain. We worked in the area until late September and then I returned to school. I had a most enjoyable season and it was really my first introductory to a systematic type of geological field mapping in a most interesting area. The following year I joined Imperial Oil as a

summer student. Nadine, may I just perhaps, I've written some notes here, I might read a bit of this out, would that be all right?

#072 NM: Absolutely, yes.

JP: This is a bit of background on Imperial's exploration efforts in the Saskatchewan, during the years 1940 to 1946. Please feel free to interrupt if you wish any of this to be expanded Nadine. Imperial, through an affiliate, Norcanas??? Oil & Gas Co. acquired, as early as 1940, a number of reservations located in south-central and southwestern Saskatchewan totalling about 8 million acres, or 12,500 square miles. The area that they acquired was designated at the time, the Moose Jaw Basin or Moose Jaw Syncline. Although the term Williston Basin had been coined in 1933 by an American geologist it wasn't in usage in Saskatchewan or Manitoba at that time. The forerunner to the Williston Basin prior to 1933 was referred to as the Dakota Basin on the extent of the lower Cretaceous sand. So there was an evolution of terminology there, Dakota Basin-Williston Basin, and the Canadians referring to their portion of the basin as the Moose Jaw Basin or Moose Jaw Syncline. An exploration office was located in the Scott building in Moose Jaw shortly after the exploration permits were approved. Premier W. J. Patterson, who headed up a Liberal administration, he was the Premier of Saskatchewan at the time and it was his administration that allocated these permits to Imperial Oil. Cam Sproule was designated exploration manager and Renny Haylopp??? was the office manager.

NM: How was Cam Sproule?

JP: He was a fabulous man. He was a very versatile geologist. The early part of his career he was involved in mining geology and pre-Cambrian geology and he excelled and was very noted. He made the transformation, I assume during the late 30's, to oil exploration. He was a noted oil explorer and probably, well, I feel he was instrumental in the opening of the Arctic archipelago and exploration in the Arctic Islands. He was really an all round geologist. He got involved in micro-palaeontology at this period of time because he felt it was an important tool and I'll enlarge on it later. He got himself involved in the work that Cushman had done, who was a noted micro-palaeontologist at the time and predicated his studies on Cushman's work and applied them to the Williston Basin with a great deal of success. He was an amazing man. He was a geologist's geologist. Like myself a bit, he was a bit disorganized about his office. I visited him on many occasions and he seemed to have maps and papers stacked everywhere and seemed to be in a bit of a state of confusion as far as administration was. But this was probably misleading because he had a most inquiring mind. He had that faculty which I think makes a good geologist and that is, to be able to conceptualize. It seems to be most important, to have an eye from something that's the unusual. I remember, that's one of the most important things I learned in my 4 or 5 years at university, was the remark that Mobsby made, it was an old trite bromide but he said, have an eye for the unusual and it's true and it's important in any type of scientific work. Something that's anomalous or abnormal or just doesn't seem to fit the equation. Anyway, Cam Sproule headed up the operation and Charlie Visser was the drilling

#123 superintendent, he was in charge of the drilling operation. There were 2 rigs involved at

the time. One of the drillers on one of the rigs of course, was Vern Hunter and you've undoubtedly had some background on Vern's activities in Saskatchewan. A number of geologists served as field party chiefs mapping Cretaceous and Tertiary outcrops in the Wood Mountains and Cypress Hills between 1940 and 1944. I can give you the names of some of these people. In 1940 Lorne Smith and Art Nauss were field geologists for Imperial Oil. 1941, Bill Hancock and Don J. McGregor. In 1942, Fred Keller, Glen Fox and Bill Macdonald. Diane Loring, and I don't know whether you've interviewed her or not, Diane was a graduate from the University of Manitoba and her specialty was palaeontology. She worked both in the Moose Jaw office in identification of these foraminifera, these so-called bugs, as Cam Sproule affectionately referred to them and she worked in the field. And I'll expand on that later. In 1943, again, Fred Keller headed the field party. Jim Millen was the instrument man and I worked as a student geologist with them. One of the other geologists that worked in . . .no, I didn't work in '43, excuse me. Fred Keller worked in '42, '43 and in 1944. It was in 1944 that Jim Millen and I worked with Fred. One other field geologist was Rod Morris, who is deceased. Fred is also deceased. Jim Millen is retired. Some of the other people involved, a geologist Gordon Beard was the tool pusher. He'd been a geologist that worked with International for Imperial in South America and had returned and he was in charge of field operations at the time. The girls that worked in the office I recall, and perhaps Bill Allen may have enlarged on. . .there was ??? Parker, Thelma Wood and Marg Wilson. Marg Wilson also worked in the field as a secretary, I think she was at Kerrobert and Leader and Hardisty, Alberta. And there was one student, Jim Williams, who I believe is still working in Calgary. so these were some of the geologists involved in the extensive field mapping. There was a reconnaissance survey was made by canoe along the South Saskatchewan River and I believe Fred Keller was involved in that. The notable Ted Link was working for Imperial at the time and in 1939 he had examined outcrops in the Inter Lake area of Manitoba, where the Devonian and Silurian and Ordovician systems are exposed. Most of the outcrops border the actual Lake Winnipeg, Lake Winnipegosis and to a lesser extent, Lake Manitoba and they occur on islands as well in the lakes. Ted Link had mapped there in 1939 because some 10 years later, in 1949 when I had a field party over there I noticed Ted Link's name was scratched on rocks, on outcrops. Ted Link, 1939.

#184 NM: So he had been there.

JP: So he had been there. But the precursor of geologists was the famous Tyrrell, who mapped the area by sailboat in 1885 and his work on that area stood for many, many years. During the field season of 1944 I served as a field assistant under Fred Keller. We mapped the Cretaceous and Tertiary exposures. For the most part, in the western Wood Mountain area and throughout the Cypress Hills, straddling the Alberta-Saskatchewan border. Our first camp was located at East End, Saskatchewan, and later on at Maple Creek and a town named Goldenlock located in the most southwestern corner of Saskatchewan. Mapping was accomplished by plane table alidade stadia work. Jim Millen, who later joined International Petroleum in South America, was our instrument man. Where outcrops were not present, on the glacial covered area, a system of structured

core holes were devised. This again, was Cam Sproule's idea. Mechanical logging, that is, the type of electrical surveys for bore holes hadn't been improved to any extent for correlation between beds. So Sproule had devised that he would drill a series of core holes into the marine shales. These so-called structure core holes, their depth averaged about 700'. They had 2 truck mounted Failing rigs that were capable of drilling 1,000'. They drilled literally, well, they drilled several hundred of these holes in which they would go in and they would core the Bearpaw Shale, and it was a homogeneous shale. The shale was decontaminated by cleaning the mud off the surface, it was segmented in 2½' intervals, a strip of this unctuous or greasy shale would be sliced like you'd cut a slice of bacon and it was soaked in water and later the insolubles were decanted off and the residue, which consisted of a few grains of silt and these micro-fossils. This is where Diane Loring came in. She would examine, we were all trained to do this as part of our time, would examine the residue from one of these 2½' intervals and determine the species of foraminifera. And although there were many species, there were about 8 that were very diagnostic that occurred at distinct levels within the Bearpaw Shale. So if we identified one, a particular species of *textalaria*??? or *globigerina*???, we would know that we were x number of feet below the top or the base of the Bearpaw Shale.

#234 NM: Was she mostly doing that all the time?

JP: Yes, she did. And in the field we would survey the elevation in the location and the elevation of the structure core hole by knowing the depth, say 613', to the top of the particular *globigerina*, that became a structural datum, and if we found it in another hole we were able to correlate the position of that to see whether there was any structure involved. This was a very, very successful application to determining. Now in conjunction with this, Imperial Oil also had seismic crews. They brought in 2 Carter Oil seismic crews, which was a sister company located in Oklahoma. The reflection seismograph surveys were conducted between 1940 and 1945. The reservations that were covered, they utilized 2 crews on a contract basis from Carter Oil Co. The only Americans that were involved were party chiefs, senior people. Otherwise, local geophysicists were hired, many of them students from the University of Saskatchewan. Fred Ross-Jones was one of the party chiefs, and he was from Oklahoma, as was another geophysicist by the name of Claire Hurey. All the geophysicist crews were Canadians, many from the University of Saskatchewan. Basically, the crews had commenced work in the general Radville area, south of Regina in 1940 and moved in a westerly and northwesterly direction towards Provo, Alberta by late summer of 1945. In the summer of 1945 I returned to Imperial again, Cam Sproule had rehired me and I became a core rig geologists and I followed one of the Failing rigs, supervising the location and the surveying of these drill holes. During that same summer Rod Morris had a field party out with a hand auger. This auger was approximately, it was a 2½' auger, a thick auger about 2" wide, it was twisted steel and it consisted of 5 joints of 5'1" water pipe. There were 5 sections, which were really hole drain pipe I guess, or water pipe and they were 5' in length. This screw auger was. . .they were screwed on in sequence and you manually, we'd auger the Bearpaw Shale. Wherever we'd see an outcrop we'd auger it. Rod Morris'

crew were able to auger down 25' into this shale. Even gopher holes . . . samples were taken in gopher holes where the gophers had actually dug into the Bearpaw Shale.

#296 NM: Did you come across Doug Layer?

JP: Doug Layer was over in Calgary at the time. He had a fabulous history, he worked back in Turner Valley in the 30's. I think he started with Imperial Oil about this time but Imperial Oil, they had an exploration staff operating in Calgary at the time. Which brings another story because Cam Sproule was a very academic geologist and practical geologist as well, but he believe in scientific meetings. Probably the first geological meetings in Saskatchewan were held at the Healy Hotel at Swift Current. The geologists from Calgary would meet at Swift Current and a group of us from Moose Jaw would take the train and go down to Swift Current on a weekend, on a Saturday. One of the geologists would give a talk on some geological subject or some drilling subject. I remember one meeting Steve Austopovich??? a geologist who was involved with one of the drill sites gave a talk on these drilling operations. Cam was a very patriarchal individual in a sense because I know that I was quite young at the time and when the session was over at 9:30 in the evening he wanted us to go to our rooms and got to bed. He didn't want us to go to any of the cafes and talk to the waitresses. But he was a great man and I felt honoured to have been able to have been associated with him, even though I was a student at the time. In 1945 I worked with a core rig crew and we worked in areas of Prelate and Biggar and Wilkie, Saskatchewan and later on, in the fall of 1946, along with a seismic crew, we moved up into the Hardisty area of Alberta. Now, during this time, in terms of . . .

NM: This is the end of the tape.

Tape 3 Side 1

JP: One aspect I must mention was the headquarters where most of the geologists and the seismic personnel lived in Moose Jaw. On River and 1st St. the largest home in Moose Jaw had been some late 19th century entrepreneur's home. It was virtually a mansion. There were fire places in every room, there was a large chandelier, the dining room was panelled in dark walnut with, as I recall, a large sailing ship encased in a glass case was recessed into the wall. A spiral stairway and a very, very large chandelier. And some farm people by the name of Brown had either purchased or rented this home and the boarders were all Imperial Oil personnel. It was a most interesting place. She was a loveable woman, they referred to her as Ma??? Brown. Her son Jim Brown, is a geologist for Imperial Oil. I believe, if he's not retired. . . he's still around I understand. This is where I met Bill Allen. Fred Keller stayed in this area. We stayed on the main floor. This would be in the spring, this would be in May before we went out in the field. I'd stay there and work in the office in the Scott Block and stayed at Ma Brown's place and then, by the first week in June we'd go out in the field. The first year, 1944, I roomed with Fred Keller and Bill Allen on the main floor. The second year, in '45, I was placed up in the servants quarters on the top floor. My room, it was a little narrow room, it was next to an Anglican church and of course, on Sunday mornings the bells would toll and they would virtually

vibrate me right out of my bed. I often wonder how the servants would manage to sleep in on Sunday morning. But this was a very interesting house. There was a dance hall just down the street known as Temple Gardens. A beautiful little creek that ran through the city which was all landscaped was in front of this area, the house was on River St. and the Temple Gardens was just down at the end of the street. Of course, the exploration personnel, the single boys would be always down there at the dances and trying to bring girls back and Ma Brown, in the morning at breakfast, she was always hoping to find a hairpin or a scarf or some feminine item that she could embarrass the . . .

NM: In front of everybody else.

JP: In front of everybody, that was one of her favourite tricks. I also remember one other little . . . the main bathroom on the main floor was a large tile bathroom. She had a very large box of Eddy matches in the bathroom, they were large matches, about 2" in length and there was a little sign in there that she wanted, after the toilet was flushed she wanted one of these matches struck to disseminate any malodour that was left in the bathroom. This is the type of person she was. Maybe she did it in a note of levity, I don't know, but she was a wonderful person.

#037 NM: A very motherly type.

JP: A very motherly type, yes. The home later was purchased by the Army and Navy Veterans Assoc. In terms of wells that were drilled in Manitoba and Saskatchewan during the 1940's, between 1940 and 1949 about 352 wells were drilled altogether. Perhaps about 139 were essentially exploratory wells, 213 were development wells. Many of those development wells were up in the general Lloydminster area, in the shallows, looking for the heavy oil. Manitoba only had about 6 wells drilled which included in this figure. But the most significant wells that were drilled were the 14 deep wells that were drilled by Imperial. These wells were drilled between May 1942 and April 1946.

NM: So in 4 years.

JP: 4 years. There were 2 rigs involved. Charlie Visser was the drilling superintendent and Vern Hunter was the driller on one of these rigs. His rig was the one that was moved to Leduc to drill the Leduc discovery well.

NM: Can you tell me a bit more about Vern Hunter?

JP: I didn't know him too well because I was on field parties during that summer and he was out in the field engaged in drilling these deep wells. I did meet him in Regina a number of years later, in the late 40's, '49, '50, '51, when he was over there as manager. I think he was manager either before Gordon Darling or after Gordon Darling of Imperial's operations in the early 50's in Saskatchewan. I had the occasion to meet him then and he was a very affable, really a fine man. To me Vern was an unassuming down to earth man and he had a certain quiet charm about him. His wife at the time was very involved in charitable work in Regina through Oil Wives I recall. But of these 14 wells that were drilled, and they were all very, very deep wells, the manner in which they were, the log histories of them will stand up to anything today that is done. Sproule did a magnificent job on them. It was the 14 wells, that I looked at the time over there, that got Rio Bravo or Superior, Nick Nicholls, interested in the potential of the southeastern Saskatchewan and

the Williston Basin. Of these 14 wells that were drilled, the 2 wells at Radville just missed . . . they found 10 gravity oil in the Midale formation and it really, if they had drilled just a matter of a few miles to the southeast they would have uncovered the trend in which the Weyburn-Midale-Steelman-Glenewan fields are located on. In which there's about, close to 1.5 million barrels of proven oil. So Imperial just missed out on the whole Midale play in Saskatchewan. They actually found the zone, they found heavy oil in it that was a little bit bio-degraded because it had been in an area of salt dissolution.

#078 NM: So that was bad luck.

JP: It was. They just missed it. Now the other fact of why they left. During, I think it was in 1943 that the CCF came into power, Tommy Douglas's party. Joe Phelps was the new Minister of Mineral Resources. It was called the Minister of Natural Resources. And I think Vern Hogg was deputy minister at the time. I suspect that the basis for Imperial to leave Saskatchewan was twofold. The results of the 14 wells that they drilled, and they were deep wells, stratigraphically, most of them bottomed well into the Devonian and some of them into the pre-Cambrian. So the whole exploration, the monies that they'd spent between '39 and 1946 on geophysics, on surface work, on administration, on land and exploratory drilling, it left them disappointed. But I suspect that the inability to reach an accord with the new government, with the CCF government, Joe Phelps on extension of their permits. And they were highly suspect of this group being socialistic, they had the fear of expropriation I believe at the time. And talking to Cam Sproule, I remember they talked about this at the time. I suspect that they didn't know whether they would be able to continue with the reservations or if the government would want to back in at the time. Something that may have been accommodated today but not at that time. I suspect further that Imperial were quite disappointed, particularly since in retrospect, when they look back and see how they had missed that main trend, the Midale trend, where most of the Mississippian oil was accumulated. There are some other people here that were involved at the time. I recall that 2 secretaries named ??? Parker and Thelma Wood worked in the exploration office for Imperial on the 2nd floor of the Scott Block. The draftsman was a fellow from Moose Jaw called Luke Lindoe, who subsequently became a noted artist, particularly in the ceramic field. Bill Allen worked, he was a student from Queens University in geology at the time. B. J. or Brian Seaman worked as a geophysicist, he had just graduated in civil engineering from the University of Saskatchewan. The Seaman brothers, Bow Valley. As well as Bruce Lawrence, he was also a civil engineer, he worked. So there were many of the civil engineering graduate, mechanical engineering graduates, that were hired as seismologists on these crews. It is my recollection that Mel Coons and Howard Watson and Jim Macdonald were also some of the well site geologists, who were assigned to the 14 deep wells drilled in Saskatchewan. Jim Macdonald I believe, had just finished high school, he was just a geological assistant to one of the geologists on the well. Nadine, maybe at this juncture we can. . .

NM: All right, this is the end of the second interview with Jack Porter.

Tape 4 Side 1

NM: This is Nadine Mackenzie speaking. This is the third interview with Jack Porter.

JP: Good morning Nadine. I thought I might preface my remarks by a couple of anecdotes about my childhood as they related to petroleum exploration. My first recollection with drilling occurred in the early 30's. Having grown up in Saskatoon, there was an early well that had been drilled on an island just south of the city, actually within the city limits. The well was drilled by the Saskatoon Oil and Gas Co. and it was known as the North Island Well. It had been drilled between 1912 and 1915 and had reached a depth of around 1,560'. My introduction to this well involved an Easter Egg hunt in about 1932 or '33. The city had promoted a search for Easter Eggs on this island and I recall that the lad who had recovered the Easter Egg and received the prize found the egg in the old casing head of this original early well that had been drilled on the North Island.

NM: So that was a good place to have hidden it.

JP: It was an excellent place to have hidden it. And another anecdote, I recall that in 1930 I attended a picnic, a Dominion Day picnic at a summer resort 20 miles southwest of Saskatoon known as Pike Lake. I recall there were the usual children's races and political speeches and during the late afternoon we walked over about a mile or ½ mile to view the remnants of an old cable tool derrick that had been the site of a drilling venture. This was the Pike Lake Oil and Gas #1 well that had been drilled between 1928 and 1929. It was a cable tool well.

NM: One of the first.

JP: One of the earlier wells. One of the early deep wells because this well got down somewhere in the vicinity of 3,600' and had encountered rocks of upper Devonian age. The same age as the rocks that were later to produce at Leduc, in 1947. Perhaps another anecdote relating to my period with Imperial Oil, in the summer of 1944 I worked with Fred Keller, he was the party chief on a field party. Fred Keller, Jim Mullen and I worked down in the Wood Mountain, Cypress Hills area of southwestern Saskatchewan and we extended into the Milk River country of southeastern Alberta. Much of our work was field survey work, plane table, alidade, stadia rod work and our traverse took us across vast areas of ranch land covered with sage brush. This is an area that was infected with some rattlesnakes but our main problem were the ticks. These tiny spiders, some of the females were infected with Rocky Mountain Spotted Fever. Through walking through the sage these ticks would get on our clothes and eventually on to our skin. We had daily searches at noon and after work, and usually in the evening. We'd scan each other to see if there were any signs of these ticks and more than once of course, we were bitten by these ticks. The actual ticks belong to the spider family and they have a pair of minute claws at the front which burrow beneath the skin and attach to the skin and they ingest blood. Once the tick attaches itself to the skin it's difficult to remove them without leaving the tick head underneath the skin. The usual method was either to make a little incision with a razor blade or sometimes, burn them with a cigarette, the latter of which wasn't too satisfactory. We learned later that the best way was to actually place a drop of

oil and within a half hour the tick would back off.

#057 NM: But using a razor blade must have been faster.

JP: Yes. At that time there were no antibiotics. The miracle drugs hadn't been introduced at that stage and tick fever, from female ticks was for the most part, fatal. Consequently we were always aware of these ticks. The government biologists were out with flannel, they'd pull it over the ground to attempt to pick up these ticks and then examine them, determine the percentage that were infected. The only precaution that we used, in the morning and during the afternoon we'd have a liberal sprinkling of sulphur on our clothes, hoping that that would keep them away. I think at this point I probably could introduce my tenure with the Saskatchewan government as a petroleum geologist, would that be all right Nadine?

NM: Absolutely. Which year did you go to work for them?

JP: Nadine, I commenced work in early May 1947. I was headquartered in Regina at the department of mineral resources. At that time there was a CCF government in power, Phelps was the minister of natural resources and Vern Hogg, C. A. L. Hogg was the deputy minister. There were just a few technical people with the government at that time, there was a petroleum engineer by the name of Frank Symington and an ex-Imperial geologist, Howard Watson was associated with the government at that time, and one mining geologist, Jack Milbury. So it was quite a small staff. My duties with the Saskatchewan government were really to investigate the possibilities of the oil and gas potential of the province. Leduc had been discovered just a few months earlier and it created a lot of interest, particularly by the government in power at the time were interested. So I did office work where I attempted to prepare cross sections utilizing the existing wells at that time in the province and the key wells were the 14 deep wells that Imperial had drilled between 1942 and 1946. I synthesized this information into a series of cross sections, which the government sold. And I investigated reports and recorded reports of oil and gas seeps. I spent considerable time in the field. Probably most of my time was spent in the field. I was on loan to the Alberta Conservation Board in the early summer of 1947. I was sent from Regina over to Medicine Hat and I worked with an Alberta employee, Nate Goodman, who was a petroleum geologist assigned to the Conservation Board with headquarters in Medicine Hat. He took me around to show me what his duties were as a government geologist. We visited the areas of activity in Taber at that time, and Princess and Patricia. Interestingly I saw, in that summer, probably the last large cable tool rig that was drilled in Alberta. It was drilled over at Empress and I think it was known as Alliance #2. It was a huge cable tool derrick that was drilled, the well was being drilled in the river flats of the South Saskatchewan River, near the Alberta-Saskatchewan border. At the same time I visited the Princess area and Patricia area of southern Alberta. It was at Princess the first Devonian oil was discovered in Alberta in 1945. It was discovered in what was later to be known as the Jefferson and Nisku formations, or Bird Bear??? as it is known now. The oil was heavy oil, it was 10 gravity oil. Chevron, California Standard at the time, drilled a number of wells and I did witness, they were steel standard derricks and they were powered by steam. They'd have

3 huge steam boilers. The well I visited at the time was the CPR-Princess 14-22-A. It was at this site that I met Don Redman and some of the other early Chevron geologists. Some of my time was spent up at Lloydminster because it was at this period there was extensive drilling for heavy oil in the generally Lloydminster area, particularly between 1946 and 1949. The government had a resident petroleum engineer at Lloydminster. They had purchased a house and the home was used as an office. Frank Symington was the Saskatchewan government's representative there and he was succeeded by Howard Watson, who was a geological engineer. I sat on some of the general wells in the Lloydminster area, garnering information for the Saskatchewan government. The consulting firm that worked in Lloydminster at the time was the firm of Edmunds, Akriss??? and Coons. Harry Edmunds, or Professor Edmunds, was a professor of geology at the University of Saskatchewan. He'd arrived there in the 1920's. I believe he retired just before his death in the early 60's. An extraordinary man and a fine geologist.

#133 NM: Did he go on teaching at the same time he had his own business?

JP: Yes, he was teaching, because in those days, I think you could say, particularly in western Canada, any report of the occurrence of oil or any minerals, whether diamonds were reported on the pre-Cambrian Shield, the industry and the news medium always turned to the geology departments, whether it was the University of Alberta, Saskatchewan or Manitoba. They would ask them to investigate into the validity of it, this type of thing. I think that's how Professor Edmunds got into the consulting. But it didn't really interrupt with his lectures. He spent most of his time in Saskatoon, although Akriss and Coons, they were sort of his resident representatives up at Lloydminster. Professor Edmunds actually, was involved in wells in the very early 30's in Saskatchewan and I have photographs of him at the Avonlea well in 1933 and '34, in the very early days. His son, Roger Edmunds, is also a geologist. He was an exploration manager for Total at one period of his career and I believe he has a small company now. Unfortunately he is one man, that is, Roger's father, Professor Edmunds, that he would have been a wellspring of information, had he been living today, about his background. I spent some time also, up in the general Camsack area and at that time drilling for shallow gas which had been discovered in 1935 at a depth of around 200'. It had continued, a number of small operators were still drilling wells. There was really no logic to the spacing of the wells and I was sent up to take a look at the gas reserves, measure the gas reserves and also, to view the general condition of the existing pipeline. The gas was being piped into Camsack and used locally. There was one interesting character there by the name of Sandy Coutts and he was a promoter and he had his own little company and his cable tool rigs. I visited him on a number of wells that he was drilling, these very shallow wells. Another man there was known as, his name was Jack Macvicker and I believe he had been connected with a company called General Petroleums. They were old cable tool drillers and they had a yard on the south side, across the river at Camsack on the south side. He had a large yard there filled with old cable tool equipment. His son, Barry Macvicker is an old timer petroleum engineer in the industry here. During the period I sat on a number of wells representing the Saskatchewan government at Meadow Lake, the

well up south of the town of Meadow Lake in the winter of 1947, '48. I sat on the Beta Superior #2 well in 1947 and it was at this well that I met Dr. J. A. G. Sanderson. He was one of the founding members of the Alberta Society of Petroleum Geologists and he visited me at the time. The well was being drilled, we were looking for D-3 Leduc reef at the time. Clarence Matthews was the petroleum engineer representing Denton and Spencer and Sandy Addison was the drilling contractor. I recall Dr. Sanderson coming over in a blue striped business suit, smoking a cigar. He had a vest pocket watch on a gold chain.

#191 NM: So very elegant.

JP; Quite elegant. But very formal. He examined the core and I recall he stayed overnight and in the morning Clarence Matthews and Sandy Addison and Dr. Sanderson, we met for breakfast in the drilling shack of the drilling superintendent, Sandy Addison. Breakfast was commenced with a 2 or 3 ounce jigger of straight rye before breakfast, which was to say the least amusing. I had one trip, a long field trip. In the spring on 1948 another geologist working for the Saskatchewan government at the time, T. Potter Chamley???. He had a long career with Shell Oil Co. and the GSC, Dr. Chamley. At the time he was just a young graduate. We had grown up in Saskatoon as boys and camped at Pike Lake in the 30's, we had camped together in the years just before the war at Waskasu, Prince Albert National Park. He had joined the Army and I think he came out of the Army as a Major. He'd been associated with the Ambulance Corps in Sicily and Italy during the war. Potter was deceased here just a year ago. An extraordinarily fine geologist as a specialist in palaeontology. At the time, 1948, we left Meadow Lake, drove by car to Green Lake and we hired 2 Indians and a freighter canoe and we went for about a 400 mile canoe trip. We were essentially reviewing the area of northwestern Saskatchewan, between La Loche and Meadow Lake looking for outcrops of Mesozoic and Paleozoic rock. Also to invest the tar sands that occurred on Peter Pond, or Buffalo Lake as it is sometimes known. We left with the 2 Indians and moved down the Green Lake and the Green Lake River on the water head and went down the Beaver River to Islacross???. I recall that when we entered Islacross, the wind was blowing from the south off the lake and the current was moving north from the Beaver River and it was extremely choppy. We ran into another canoe with an Indian woman who was about to give birth to a baby and it was very apprehensive, we really couldn't move out in the lake. So we moved out first and they followed us and we went in to Islacross. At Islacross there was a Roman Catholic mission and a Roman Catholic school and there was an interesting man there, a Dr. LaRoy, who was a medical doctor. He was a Parisian doctor who ran the mission. I had been paddling a lot and had had a stitch in my side and I was going further north in isolated areas and I didn't know whether I had an attack of appendicitis. I went to his office and his wife said that he was over at the café. We went over to the café and I looked around and I couldn't see anyone that looked like a doctor. I saw 4 men, 2 in coveralls, sort of dishevelled and 2 other men informally dressed and they were playing cards in one of the booths in this old café. I asked if any of them knew where Dr. LaRoy was and one smiled and said he was Dr. LaRoy. I recall he asked me what my problem

was, I introduced myself and I said, well, my side is sore. We've come up from Beaver Lake, we're going north and I just wanted to check to see whether I had appendicitis. He was more intent on looking to see whether he had a royal flush in his hand. He was holding the cards in his right hand and he was feeling my abdomen with his left hand and I guess the pain was on the wrong side. He said, what have you been doing, lifting. I said, I've been doing a lot of paddling. He said, it was probably the paddling. But later that day we met him at his home and he was a bit of an amateur archeologist. Islacross had been the headquarters for Northwest and Hudson Bay Co. forts and the one island there, Black Island, there had been probably a number, at least 3, 4 or 5 forts that were built prior to 1821, prior to the merger of the Hudson Bay and the Northwest company. He spent his days out there with a spade digging around at these old forts and excavating some of the Hudson Bay and Northwest Co. artifacts. I recall that in his home he had a series of kettles, they were copper and iron kettles.

#268 NM: That he found?

JP: Different sizes and he had them suspended with plants in them on the wall. Both Potter Chamley and myself had been very intrigued, we were both sort of amateur archeologists. The initial part of our trip, at the south end of Green Lake we had found the site of an old fort, a smaller fort, which apparently at that time they would go overland from the Saskatchewan River, north to Green Lake and it had been sacked I think, during the time of the Riel Rebellion I heard. A squatter had been living on the site of this fort, we found out where the timbers were and where the fireplaces and we were digging around and Potter had got an old clay pipe and the fellow that lived there gave me a little serrated pendant, a brooch, with a beautiful yellow Chelsedney??? agate, piece of agate in it. Which I probably should give to a museum, documented. But it was quite an interesting souvenir. We moved on, after we left Dr. LaRoy, we went up the Obisham??? Arm to Peter Pond Lake or Buffalo Lake. It was on the west side of the lake that we examined the occurrence of tar sands there. Tar sands there but they're not in place. They're big blocks of sandstone that have been incorporated in the glacial drift and have been moved by ice from the general Waterways area, where the known tar sands are, through the action of the continental glaciers and had been dumped there. Our assessment was right, we realized that the deposits were erratic, they weren't in place, they had actually been transported from the general McMurray area. We found evidence of very early drilling there, in the 20's, that someone had drilled there looking for evidence of tar sands. We subsequently returned to Meadow Lake and back to Regina to make our reports. Later in the summer of 1948 I sat on a well, Inter Provincial Petroleum well, about 25 miles southwest of Maple Creek. I finished my career with the government, I worked on a field party with Dr. Lawrence Russell and Potter Chamley worked on the party and another government geologist, and old timer in the business, D. Y. Don Cooke. We worked with Dr. Lawrence Russel and mapped the Cypress Hills. It was repetitious because I had worked there in 1944 with Imperial Oil in the same area. This was 3 years later, I was working the same area. It was at that time, I came in in the fall to Regina and resigned from the Saskatchewan government to work for industry. At that point in time, all the

geologists with the Saskatchewan government were offered jobs by industry. Because geologists were so difficult to get after the discovery of Leduc, all the companies wanted to build up their staff of geophysicists, there weren't enough around. And each of us had a dozen offers from different oil companies.

NM: This is the end of the tape.

Tape 4 Side 2

JP: Nadine, I think at this juncture I'll speak of my role with Rio Bravo Oil Co. in the late 40's and the 50's, working out of Regina. I left the Department of Natural Resources at the end of October 1948 and I commenced work with Rio Bravo Oil Co. in Regina in November 1st, 1948. Rio Bravo Oil Co. was a wholly owned subsidiary of the Superior Oil Co. The Spanish name Rio Bravo, the name was taken from the field at Bakersfield, California, the Rio Bravo Oilfield, which the Union Oil Co. and the Superior Oil Co. had been instrumental in discovering. At the time a company known as New Superior, a Canadian independent. . . by using the name Superior it had precluded the Superior Oil Co. from carrying the name Superior and incorporating it into a Canadian company. At the demise, in 1950, of New Superior, or its subsequent merger, the Superior Oil Co. changed the name Rio Bravo Oil Co., this was in 1950, to Canadian Superior Oil of California. That was the second name the company had. It was later to be shortened to Canadian Superior Oil Ltd. Following Leduc a number of companies, Imperial Oil, Shell, Sun Oil, Union and many others had visited my offices in Regina. They were anxious to get information on the subsurface geology of Saskatchewan in an attempt to evaluate the oil and gas prospects. I had the occasion in the spring of 1948, in May, to meet Nick Nicholls as he was known, Norville Nicholls. He and Art Feldmeyer were 2 American geologists that had arrived in Calgary in 1943 and they were the founding employees of the Rio Bravo Oil Co. And had concentrated, for the most part, in Alberta, during that period, 1943 to 1948. The company was very small, they had 1 secretary, Shirley Pritchard, and 1 woman geologist, Mary Turner. I had met Mary Turner in 1945, I think over at the University of Saskatchewan. At any rate, on November 1st I moved into an office above a dry cleaning establishment known as Bragg Dry Cleaners on Albert St. in Regina. Rio Bravo was the first large oil company, following the departure of Imperial in 1946, the first company to return to Saskatchewan again. At the time it was recognized that much of southeastern Saskatchewan and southwestern Manitoba contained a lot of free hold land. Most of the mineral rights of farming lands in western Canada, the mineral rights are vested in the Crown. But in the early days there were grants known as Queen Victoria grants. When a homesteader purchased a parcel of land he received, not only the surface rights, but he

#050 received the mineral rights as well. Since the early pioneers settled southwestern Manitoba and southeastern Saskatchewan before central Saskatchewan, west-central and Alberta, there's a greater proportion of free hold lands in southeastern Saskatchewan and southwestern Manitoba. There's more to the southeast than free hold land to the west. One other problem, within each township subdivision, 3/4 of section 26 and all of section 28, the mineral rights are vested in the Hudson Bay Co. This was part of the agreement

that was reached around 1869 when the Hudson Bay surrendered Rupert's Land to the federal government. They received the ownership of the mineral rights on section 8 and 3/4 of 26. At any rate, the land diversity, those mineral rights that were vested in the Crown in southeastern Saskatchewan and southwestern Manitoba only amounted to about 35 or 40% of the total land. The remaining was vested as free hold and the farmers that farmed the land owned the mineral rights. As a consequence, Rio Bravo Oil Co. set on a policy that they would take leases of this free hold land. They weren't interested in the Crown land. If they were interested in the Crown land they would have to deal with the government. Rather they just took a checker board representation of land in southeastern Saskatchewan, southwestern Manitoba. This leasing program was commenced in 1948, got going in 1949 and where we leased was predicated on the results of subsurface work that I had done in Saskatchewan and in Manitoba. In the summer of 1948 I examined all the Paleozoic rocks between Winnipeg and The Pas, attempting to look for, the interest at that time of course, was Devonian reef. At the same time we leased some 1 million acres in southeastern Saskatchewan and about 6 or 7 hundred thousand in southwestern Manitoba. At the same time, Imperial were our principal competitors. They came in and leased at about this time. The land was leased for between 10 cents and 25 cents per acre. That's the price the farmer got. And they were essentially delayed drilling rentals. The farmer received a 12 1/2% royalty on any production. If a well was drilled on his land and oil was discovered he received a 12 1/2% royalty. The brokers that Rio Bravo used, a fellow by the name of Holmes from Oklahoma and his son-in-law Bandy Lee. They set up offices in the Drake Hotel in Regina and recruited teachers, insurance men, lumbermen, anyone they could get hold of, distributed blank lease forms to them and sent them out into the country to pick up these leases. I believe they received about the same price, 10 cents or 25 cents an acre for each lease they obtained. At the same time clerks were employed to check the field title service, that was one of the big problems to actually determine ownership of the mineral rights. Because as the land was sold from one farmer, passed along to his son, it entailed going to the field title offices and instigating what they call searches to determine who had the mineral rights. In 1949 a company drilled a well

#100 right in the southwest corner of Manitoba. The company was Cirrus??? Valley Oil Co. and they drilled a well, Gordon White???, that was the name of the well. Rio Bravo Oil Co. had a contribution of \$20,000 into the well and in return they received a proportion of Cirrus Valley Oil Co.'s leases in this general area. I sat on the well for Rio Bravo and the interesting thing about the well, that it discovered a thick wedge of rocks of Mississippian age. This was critical because in the outcrop area there was no evidence of any Mississippian strata. The Mesozoic rocks were essentially resting on Devonian and older Paleozoic rocks. As a result of this disclosure of this thick wedge of Mississippian in southwestern Manitoba the leasing program was intensified. In 1950 the large company that was operating in Manitoba during this era was California Standard. They had seismic crews working in Manitoba on the Cirrus River, in 1949 and 1950. I believe Don Weir was supervising it from Calgary and Bill Bannister, I believe, worked on one of these crews at the time. At any rate, Chevron drilled their first well, the California Standard

Daily 15-18. This well was in LSD??? 15 of 18, township 10, range 27, west of the principal meridian. It was the first well in the Williston Basin to find evidence of commercial oil. The well was spudded in November of 1950 and saturated Mississippian cores were recovered in late December. The information was held tight until the spring. Information got out in the late winter, early spring and suffice to say, there was a rush on more intensified leasing than ever in Manitoba. This discovery well produced a limited amount of oil but it led to the subsequent discovery of the Virden, Stallion, Rosalie, Daily fields. At the same time the Clarence Iverson well, drilled on the ??? anticline in North Dakota, the same year, 1950, had discovered commercial. Amerata Petroleum had made the discovery. At the same time the activity had been intensified in the American portion of the Williston Basin. Through the acquisition of some 1.6 million acres of free hold land ownership in southeastern Saskatchewan and southwestern Manitoba, Rio Bravo Oil Co. was faced with the gargantuan problem of evaluating it. They had limited resources and in Alberta they were concentrating on putting seismic crews on and drilling a number of early wells. At the time it seemed they may have bitten too much off. The acquisition of the land didn't cost them that much money, it was the problem of the daily, yearly rentals of 10 cents or 25 cents an acre that they would pay out. The leases were for 10 years. The problem was how were they going to get this land evaluated. They didn't have the exploration money. So my job became working up plays on this land. I had a staff of 3 or 4 geologists, Lloyd Flood, who's now with Bow Valley, Frank Scrimshaw, Ted O'Bertis. Several scouts, Doug Clark, Ken Green, a number of draftsmen, Frank Armitage, I don't

#150 know whether I mentioned Ted O'Bertis. Who were some of the other geologists, Bob Lee, Gordon Bowens, the latter 2 are still with Canadian Superior. We were involved in mapping prospects on this massive spread of free hold. The corporate policy at the time, of Rio Bravo Oil Co. was to farm this land out to companies who were interested in exploration in Saskatchewan. As many as 24 prospects or drilling commitments would be farmed out at one time. Companies like Dome, companies like Husky, Shell, any number of companies took farm outs from us. As a consequence we were involved in some, close to 900 wells that were drilled, either directly or indirectly contributed to evaluating our land. The subsequent production amounted to some 13,000 barrels a day from this. In reality the company did a certain amount of development drilling after discoveries were made but by and large, it was the industry, these other companies that we had made farm outs to that discovered most of the oil that we brought into production, either through joint ventures, royalty interests, any number of avenues. The area at this time, commencing in 1949, after the discovery of the Cal Standard Daily 15-18 and the Clarence Iverson discovery, there was an influx of companies into the general Regina area. At that time the industry wasn't centralized. A company would have a district office with a small staff as opposed to today, where the districts work right within the organization. For instance, in our own company, Canadian Superior, we have a Saskatchewan district on one floor, we have a west-central Alberta on another one, northwestern Alberta, B.C. frontier areas. At that time Imperial, Shell, Husky, Albercan, Amerata, all had small offices in Regina with a handful of geologists. Some of the

companies, Imperial and Shell, had larger staff because they were big companies. So you were much closer to the scene of the operation at that one time and in retrospect, it undoubtedly was much better. Much of my work was public relations, selling and working on geology and plays at that time, and promoting exploration drilling on our land. Which was highly successful and really, it gave the impetus to get Rio Bravo or Canadian Superior Oil of California on their financial feet. Many of those wells are still producing today. In 1950 two companies moved into Saskatchewan, a consortium, one was the Tidewater group and Howdie Kirk was the general manager and Claude Leach was his assistant. The other company was Sohio Petroleum. It was a consortium too. Both companies had in partnership, 3 other companies. Harry Ross was the general manager of Sohio Petroleum and Bob Bishop was the exploration manager. Bob Millner was the chief geologist for Tidewater Oil Co. Both

#200 these companies were very, very active in Saskatchewan. Tidewater was particularly successful in the general southwestern Saskatchewan, on the Jurassic play, the Dollard fields and so on. Imperial Oil were active. Gordon Darling worked, he took over my office in the Bragg Dry Cleaner the following year when we moved to the Canada Permanent and Mortgage building in Regina. He was succeeded by Vern Hunter and also I think, Gordon . . . the fellow that was just deceased here. . . well, his name will come to me in a minute. Much of the activity at that time in Saskatchewan, the oil scouts were employed, at the early stages they were employed in determining which companies were doing seismic activity and where they were shooting this seismic. Because of the availability of free hold land if they found one company was concentrating their seismic, doing detail work in one specific area they'd recommend to their management that they buy land. So there was intensive seismic scouting at the time. And once the drilling got going there was extensive scouting of the exploratory wells that were being drilled at the time. The Saskatchewan government was involved in the disposition of Crown and sale lands and J. K. Swanson was the director of mineral resources at the time and Vern Hogg was still the deputy minister. A man by the name of Brocklebank, a very fine man, a good public relations figure, he succeeded Joe Phelps and he was the minister, they had changed the name at that time I believe to the Mineral and Natural Resources. The Canadian Petroleum Association had an office in Regina in the early 50's and Bert McGillvery was the general manager and I served as the director there for a number of years, representing Canadian Superior. Vern Hunter was also a member at the time, during his tenure there. Probably the most active period in Saskatchewan, in the Williston Basin, were the periods between 1952 and 1956. Most of the oil was discovered then, I think in the year 1952 the huge fields, Weyburn. . . Steelman was discovered first of the large fields, then Midale and then Weyburn. There were periods of very extensive exploration. By the late 50's our leases began to expire. We recognized that we couldn't get them all drilled, only a small proportion of the leases actually got drilled and the leases were up for expiration. Most of the wells had been just drilled into rocks of the Mississippian age, the upper part of the Paleozoic. Not much was known at that time about the potential of the Devonian or the

#250 Silurian or the Ordovician or Cambrian, the deeper Paleozoic potential reservoirs. As a

consequence Superior decided that they'd go back in and they'd renew the leases for another 10 or 15 years. They even were interested at the time in what they call top leasing, other companies leases. In as much as they would pay a lessor a small sum that essentially would be an option, a first right of refusal to release say, Shell or Imperial or other competitors had the land. So Canadian Superior Oil of California, as we were known in the 50's, we went in and did an extensive top leasing program. However, these leases were extended until approximately 1968, '69, '70 and although we didn't lease on top leases not near the proportion of acreage that we had previously held under our original leasing program, very few deep wells were drilled in the 60's and early 70's in the Williston Basin. At least in Saskatchewan and even in Manitoba. Probably because of the interest that had moved in the Alberta area, in the late 50's, in the discovery of Swan Hills and in the 60's, the discovery of Rainbow. There was a general migration of industry into the northern areas of Alberta and into B.C. as a result of the former logistics and economic constraints becoming more viable at this point. Although there was extensive exploration going on in the late 60's and particularly in the 70's, in the American portion of the Williston Basin, Saskatchewan was precluded from exploration. Of course, it's been resurrected here in the last number of years. The years I spent in Regina were enjoyable years, they were exciting years. It was interesting that I was fortunate enough to have found the industry right on my doorstep. Exploration in essentially, almost a virgin basin, there had been that many wells. I think even during the 40's there had only been some 136 wells had been drilled in Manitoba and Saskatchewan, significant wildcat wells during that whole period. So it was really the pioneering part I saw. I witnessed the discovery of the first commercial oil in the Cal Standard Daily 15-18, which Canadian Superior participated in. Johnny Orr, who's

#300 now deceased, he sat on the well for California Standard and my assistant, Lloyd Flood, he represented Canadian Superior. Another geologist, Mike Stanton, a Chevron geologist in Regina, and myself, made many trips down to the well during the course of the drilling. So they were exciting years and it was interesting that I was able to witness the exploration of a basin from when the first discovery was made until the point in time where some 2 ½ billion barrels of oil had been discovered in some 230 fields in the Williston Basin. I was transferred to Calgary, I was a district geologist in Regina, I was appointed to chief geologist of the company in 1960. I was transferred over November 8th, 1959 to Calgary and I worked as chief geologist for the company until 1972 and then I was involved in international geology when Canadian Superior Oil got involved in foreign operations. I was appointed manager of geology at that time and I worked for 10 years in the international section, out of Calgary. I didn't do much travelling, most of my work was evaluation and research work and assessment of basins and submittals in various companies to participate in foreign exploration. We were reasonably successful. About 10% of our production and net income has been derived from foreign exploration. In 1982 I was transferred back, our international section was transferred to Houston and I was transferred back to domestic exploration as senior geological advisor. Nadine, it's been a pleasure being interviewed by you and I hope I've been able to contribute something to the history of the exploration, particularly in the Canadian portion of the

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Williston Basin. Thank you kindly.

NM: Thank you Jack, it was very, very interesting.