PETROLEUM INDUSTRY ORAL HISTORY PROJECT
TRANSCRIPT

INTERVIEWEE: John Andrichuk

INTERVIEWER: Susan Birley

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SB: I'm interviewing John Andrichuk, May 16th, 1983. I wonder if first of all, you could begin by just telling us your early background, where you were born and raised and went to school.

JA: I was born near the little post office in Downing, Alberta, about 90 miles east of Edmonton and went to country schools in the general area and moved to the city of Edmonton for grade 8 and finished Victoria High School in Edmonton in 1943.

SB: Did you have any 9 interest in geology at an early age?

JA: I had great interest in travel, adventure and my aim was to go around the world as a starting point in life. Geology being primarily an outdoor profession, at least at that time in its development it seemed like a good profession to get into in order to travel and see the rest of the world. So I decided to enroll in geology at the University of Alberta in 1943 and completed the bachelor of science degree in 1946.

SB: When you completed your degree did you have any immediate goals, did you want to go right out into the field or were you thinking of continuing on at that point?

JA: As it turned out, in the 2nd year of university in the geology course, every student is required to work in the field. I had several offers of jobs for that summer and the summer of 1945 I took a job as a field assistant to a geologist with Rio Bravo Oil Co., which is a Subsidiary of Superior Oil of California, in the foothills of northwestern Alberta, north of the Smoky River and south of Wembley and Grande Prairie. It involved mapping of stratigraphy and structure, mainly Cretaceous beds between Wembley, or the Wapiti River at the north and the Smoky River at the south. We used horses to get in, it took us 5 or 6 days by pack horse to get in to the starting point of our work. So we were pretty isolated all summer, we had to take all of our equipment and supplies in. That was a very enjoyable summer and it was the kind I'd been looking forward to. The only thing was that after several months you do become very isolated and I was wondering whether I might be doing it the rest of my life and that was really too much of a good thing.

#036 SB: How many people were on the crew with you?

JA: About half a dozen. The geologist in charge was Orville Nickles, we called him Nick Nickles, known to many people in the industry. Unfortunately he was drowned in Hawaii around the early 60's but he had studied at Yale and had been to ??? and New Zealand and came out here to do field mapping for Superior Oil Co. He'd had a party up here earlier, in the foothills and this was the 2nd year. The overall boss of Superior Oil was Art Feldmeyer, who has just retired recently from McIntyre and Superior]. John Baxendale, a consulting geophysicist was also assistant on that party. We had an Indian, I've forgot

his name, it was Dan St. something, who was the you might say, knew the country and the trails and so on and then there was a Metis Indian as a helper.

SB: How big was Rio Bravo at that time, was it a very big department or company?

JA: No, I think just Art Feldmeyer and Nick Nickles and probably, a couple of girls in the officer here in Calgary. It was just like many other companies, they just came up here during the war when there was presumable demand for oil for the war effort.

SB: Did they work with any other companies in the area?

JA: No. There was no cooperation or there was no partners for Rio Bravo. And there was very little cooperation which I noticed and didn't seem to understand why there wasn't more cooperation in the field. They were all doing independent studies in the same area but they ran almost secret operations. The other companies that were in the area were Texaco and Phillips Petroleum. Imperial Oil, under Charlie Stelck was in the area part of the time. Charlie Stelck of course, was the only person that really helped me out on the geological problems. I might add here that I was a very junior geologist. I only had 3 geology courses and I worked with Nickles closely in the field for about 2 or 3 weeks and then he turned me loose on my own. Which involved climbing mountains by yourself and going all day, leave the camp at 7:15, 7:30 in the morning and coming in at 6:30 at night. That's just something that wouldn't happen today because if there was any accident or anything like that a person could perish in there, nobody would know where you were. But we did try to leave our planned travellers in general, where we were going for the day. And we weren't scared of bears or anything, like people are today.

#073 SB: Did you have many encounters with bears and wild animals?

JA: I only saw one regular bear and we saw one grizzly bear but they were some distance and no problem. Although one time I was by myself, near the top of a mountain ridge and I could see evidence that a bear had just got up, the spot was steaming and other evidence that he had just left. We saw a lot of moose and deer, moose were very, very common.

SB: What was the camp life like, were you hunting for your meat?

JA: We started out with a lot of canned supplies that we brought in but after several weeks we started running out of the fresh meat so we did kill a moose one time and a deer at another time. And the cook was a good fisherman, he caught fish sometimes so we did supplement it a little bit. But we really had good experts in hunting, with the Indian guide and the cook was quite an outdoorsman.

SB: So was there anything of significance that came out of the field work at that time or did it contribute to future knowledge of the area in any way?

JA: Yes, I think we mapped the Cardium??? sandstone for instance, mapped structures. I remember Art Feldmeyer, who only came up for a couple of weeks in the middle of the season went on a brief trip to the muskeg anticline near Grande Cache on the Smoky River, that was the south end of our area and he was so impressed with it that he immediately went to town and tried to file on the lands for Superior Oil. Now I think other companies had the same idea too so I don't know what ever transpired there but he was suitably impressed with the structural geology possibilities that he immediately went to town and ???. We collected a lot of samples of rock types and of fossils, particularly,

because I had taken palaeontology, my job was to collect fossils and even identify them if I could and try to determine some of the formations. And the collection went to the University of Alberta in Edmonton and Dr. P. S. Warren worked them over. I think the results of these collections has been published, so there was a contribution that way. And I think that the mapping we have done, we used aerial photographs, we plotted structures on aerial photographs, those were all brought in at the end of the year and I think a map was made. Although I left the company later I presume they probably investigated the larger structures in terms of leasing them and maybe conducting exploration.

SB: What were the wages paid at that time, was it a well paying job?

JA: I think I was paid $100 a month, plus board and room in a tent up there. And at the end of the year, Art Feldmeyer and I got along very well and he gave me a $10 raise retroactive for the whole 4 or 5 months and that all helped. I also was offered a job by the Geological Survey approximately at the same salary, slightly less, so it seemed to be the going rate for an assistant. I might also mention that this was during the war and there was a shortage of geologists and that's the reason that such junior people as myself were actually doing work that was really beyond their ability. In other words I wasn't fully trained for the job but I had to learn very fast.

#120 SB: You graduated in 1946, that was after you worked for Rio Bravo was it?

JA: Yes, I graduated in 1946, a year following, then that following summer I worked for Central Mining Services on gold exploration at Indian Lake, about 100 miles north of Yellowknife. So I worked in mining that summer.

SB: Was that a government company?

JA: That was a syndicate of small mining companies from Toronto that all amalgamated their property which occurred in the same area and they used one group of people to explore all the properties for gold. We did find a gold property which I understood, they developed for awhile but it never really went into commercial operation. But the gold prices were relatively high at that time and it was encouraging gold exploration. So many of the students of my years there worked in Yellowknife or north at that particular time.

SB: Can you remember any of the names of other students that stayed on in the petroleum industry?

JA: Well, my partner, Ralph Edie was working on the pre-Cambrian shield at that time. And Vern Taylor who graduated with me, he's now a rancher at Ponoka who's never practiced geology but he was up there that summer. Gordon Scruggs, who just retired from United Cansol and now is working for Merlin and Turbo also was in our camp. James Hartwell, who subsequently went into mining, a big mining promoter in Toronto, also worked up there. Don Graves and I worked together in the same camp, he was a mining engineering graduate from the University of Alberta.

SB: So it was quite a sizeable crew then?

JA: Yes, we had a main camp and what we called a north camp and a south camp. The main camp was already undertaking development of the mine operation and the north and south camps were exploratory camps, looking for new properties. I was in the north camp. Both camps were along this lake called Indian Lake.

SB: So Central Mining Services, were there any major mining companies that have survived up until now that were involved with it?

JA: I don't think any of them really survived in name. Probably the operations got amalgamated. I don't recall any of the names surviving but Colomack was one of the big ones. Indike Mining, Colomack Mines were the 2 big ones and you don't see them on the stock exchange but they did continue their operations and were absorbed by other companies.

#164 SB: Can you remember the name, who was the party chief for your part of the operation?

JA: For my camp, Don Graves, the mining engineer, he was in charge of the camp. I was his assistant. Actually each camp had a mining engineer and a geologist but he was in charge. And then we had Gordon Scruggs, who was just a 1st or 2nd year geologist, was in our camp and there were a couple of Air Force fighter pilots veterans that had gone to university. They were much older than myself but they were junior geologists because they just had one year of university. I forget their names, they were Air Force veterans.

SB: Did you notice if there was any exploration for petroleum going on up there at that time?

JA: The closest indications of oil at that time were of course, Norman Wells which was up on the Mackenzie River. Of course, Yellowknife and Indian Lake were on the pre-Cambrian shield and of course, the other closest operation were the tar sands. I might mention that my first encounter with oil was really with the tar sands. When I graduated from high school I took a job with Abassan??? Oils for the summer, working as a carpenter's helper building a townsite for the Abassan Oil plant which was being built up there. That was the first time I saw the cliffs of very impressive, what they called tar sands at that time, we call it oil sands now, which in the hot sun just almost flowed like tar. It's a very impressive sight for a young person to see and left quite an impression on me later.

SB: Were there any special problems due to the location? It was in the Northwest Territories, how did you get into the camp and. . .?

JA: This may be a bit of an interesting story. We were writing our final exams the end of April and we had this job to go to. I had 1 or 2 more exams to write and our employers told us we had to get on the plane that day otherwise we couldn't get in there until after break-up which would be 6 weeks later. The plane had to land on the ice with wheels. The other fellow and I decided we wanted to get our degrees because if you put something off you may not actually graduate. So we said no and we actually did get in on the last plane as it turned out. Actually we had to wait on a plane out of Yellowknife for a couple of days as it turned out. So it was the correct decision that we had made as it turned out.

#212 SB: Were you very impressed with the landscape there, or what was it. . .?

JA: What you notice most up there is the great swarms of mosquitoes and they are very, very tough. And horseflies and what you call no-see-ums. That was the first impression of the country. It's a tundra type country. We still had trees there but very close to the tundra, but just lakes and rock. And it is, it's picturesque country. And it was easy to get around

in because we used a canoe once we were up there, we had canoes with motors on so we could cross the lakes easily. Between the lakes you'd have solid ribs of these rocks. It was easy to traverse, much easier than the foothills where you had a lot of deadfall and you had to climb over trees. Over here the access was quite easy.

SB: What did you do when you'd finished your field season that year?

JA: That was when I decided to take a trip around the world. I didn't have much money, by the time I'd paid off my debts I had no money so I had to work my way around the world so I had to get a job on a ship. So I went down to California and I tried to get a job on a ship and they had a strike there so I couldn't do it. I came up to Vancouver, stopping on the way in Oregon to pick cranberries in order to make enough money to keep going. The problem getting on a ship was that I'd never seen the sea before and you couldn't get a job deep sea sailing unless you had papers that you had sailed for 2 years along near land, coastwise. So I had quite a job getting on to a ship. But I did get on to a Swedish ship which had no union and didn't require these tough roads. So I got on a Swedish ship and sailed across to China, Shanghai and north China, Manchuria and then the Philippine Islands. That was quite a long???. I had to jump ship there because the ship was going back to the west coast of the U.S. And of course, got detained by the law enforcement people there and I had a bit of a trial there but we did win out the situation. So then I caught another ship, a Canadian ship. By that time I had the experience, I got a Canadian ship and it sailed from the Philippine Islands via Borneo, Singapore, Malaya, Ceylon, the Suez Canal, through the Mediterranean, Morocco and up through to the low countries, to Copenhagen and the Scandinavian countries and then ultimately, over to Baltimore in the U.S. I had signed a 2 year contract for that job and of course, the captain knew I was going to go back to school so I had to jump that ship again and of course, got into trouble with the law again. But ultimately I worked my way back to Edmonton in time to register for graduate work the fall of '47.

#269 SB: That must have been quite an adventure at that time because there weren't many people travelling around the world then.

JA: No, I couldn't find a travelling companion at all. People that said they would travel with me backed out at the last minute. So I had a couple of friends, one was a Danish sailor, travelled with me on that first leg, from the far east to Copenhagen. Then I met an Canadian engineer on the Canadian ship. After I got off in Baltimore he helped me and got all my gear off the ship illegally because I had to ??? and then we hitchhiked across the U.S. and went over to Victoria where he lived then I came back to Edmonton.

SB: So did you decide to go into geology at the University of Alberta again?

JA: Yes. One of the discouraging things about, although I enjoyed the 2 seasons of field work, I thought that this could happen for the rest of my life and these were pretty isolated places. I even thought about switching into chemistry but by going away for another year, I came back, I mellowed a little bit and I figured I had a good start in geology, I'd just continue in geology. By that time there was the possibility of geology becoming a little less an outdoor occupation. ??? in the civilized areas. And even the distant areas like the foothills have become civilized since then. So I started graduate

work in Edmonton, for 2 years, and graduated in1949 and did a thesis, probably it was one of the earlier theses on subsurface geology. I looked at cores of 2 Texaco wells drilled west of Edmonton in the Magio Lake area. I studied the lithology, correlation and fossils of the Devonian, Mississippian and Cretaceous beds in these 2 wells. Professor Stelck, who at that time had just joined the university as an instructor taught me a lot about palaeontology and was just an excellent person to do a thesis under. It was a good experience and subsequently a great number of my colleagues and later students did theses under Dr. Stelck.

SB: So this stratigraphic analysis, is that what you would call it, was it a relatively new method at that time or what were the commoner methods of exploration?

JA: At that time they were still basically looking for structures and they were just getting to the field of stratigraphic traps. When they found the reefs in Alberta, they realized that although people call them structures and beds, a lot of them are structurally flexed and have structural accumulations above them. The reefs are basically stratigraphic traps and carbonated rocks.

End of tape.

Tape 1 Side 2

SB: So you were saying about the stratigraphy.

JA: Yes. After I graduated with a Masters degree in 1949 I worked that summer for Bear Oil Co. and my job was, they called it party chief of a canoe expedition going from Smith, Alberta to McMurray with the idea of describing, sampling and mapping the main Cretaceous rocks exposed along the Athabasca River. We used a plane table for mapping the detailed structure on various horizons in the Cretaceous. So although we did study the character of the sediments in great detail, as I understood it, the company wanted us to map any structures that occurred along the river which they could then drill. At that time Bear Oil Co. was drilling a number of wells and they were locating some of them on gas seep areas which presumably are structurally high. As I recall, I don't think any of the structures we mapped, we mapped several, were actually drilled by Bear Oil because the main thrust of their drilling was just about finished by the time we finished our work. It's interesting to mention people. There were only 3 of us in the party, Sam Bahan, who worked for many years with Sun and is now a consulting geologist was geological assistant and Jack Grieg was the student engineer, he was the instrument man. We hired a 4$^{th}$ man when we got into the rapids because we had 2 canoes and we had to shoot a lot of rapids which was a very great adventure in the last month of our work in there. That river is pretty treacherous and every year it claims some lives. Although nobody lost a life in the time we were in the general area there was one individual from the east who bought a small canoe and was canoeing and had gone past us one day and a couple of days later we found him across the river from us. He had a little fire lit and it was raining and he'd lost his small canoe in the rapids. So we needed a 4$^{th}$ man and he was a good canoe man so I hired him as the 4$^{th}$ man and he worked with us the balance of the trip. I must say that I paid him the same salary that the assistants were getting and I got my knuckles rapped

about that from head office but they did honour it, they did pay him the salary. But he was worth it. But I figured that everybody was working really hard.

#053 SB: Did you go by any of the tar sands area, did you get close to that?

JA: Yes, in the lower stretch of the river, the tar sands appeared and we mapped them in great detail and sampled them. I took a lot of samples which I was hoping to use for my post graduate thesis later but it turned out that many other students used our samples at the University of Alberta and the university I went to thought that that area of study was too restricted just along the river, so I had to select another topic later for my thesis. We mapped the tar sands as they came in first from west of McMurray and followed right in to McMurray. At that time we could see a lot of the features which are described today, like cross setting in the sandstones and the differential amount of oil that impregnates different sands and so on. And the relationship to the overlying clear water ??? beds. I might also mention that when we went down that river there weren't that many people, although it's a historic trail down there for canoeists, some of the earlier geologists, Dr. R. T. D. Wickenden, who's retired now in Victoria, described beds in this general area we worked along the river. And I had his publication to help me, he described particularly the clear water beds, were part of the Athabasca River. And Colin Crickmay, for Imperial Oil passed down that river earlier and I heard some of the local people talking about Dr. Crickmay, so I heard about him before I knew him.

SB: Would you be willing to recount any of the stories you heard of him, or were they that colourful, or significant?

JA: He made his mark wherever he went. He was a very meticulous person and very fussy about whatever he did and presumably whatever he ate. So that's the type of thing that stands out and he's very much the same today. But when you get to know him he's a very sociable, very mild person when you meet him in a social framework, like across the table. But he does have antagonists and people who are in fear of his wrath scientifically. Because he's a very meticulous worker and he's also a critical man but a top notch scientist.

#089 SB: Could you tell us about Bear Oil, did you work closely with any of the major shareholders in it, or can you remember the major shareholders?

JA: They were again, a consortium or syndicate of independent oil companies, including Pacific Petroleums, Sun Rite DX, several American companies. The key figure involved was Dr. Ted Link and he was the overall exploration manager for Bear Oil Co. I encountered him the first time on the river. One of the finest individuals I've ever run into. Arthur Noss, who was an expert on Cretaceous and micro-palaeontology was the person who actually hired me. John Downing was working for them at the time, doing field work. Pierre Cote, who later worked for Imperial and now Petro Canada was with them and Fred Trollop. I might mention that when we started going on the river our parties were combined. Pierre Cote had one party and I had the other one. Pierre Cote went up the Clearwater River doing the same thing as our party did down the Athabasca River. So our parties started out in a combined operation in Smith on the Athabasca and

then Pierre Cote went up the Clearwater and I continued down. And a rather interesting feature is that we finished up about early September and a month later we arrived at McMurray at the confluence of the Clearwater and the Athabasca River and it was unbelievable but their party arrived there exactly the same time and the same hour. We met on the river. So it was quite a coincidence. I still remember that. The other person that was involved was Lorne Faulkner. He was also a senior administrator of that operation. But Arthur Noss, Ted Link and Jack Browning was also involved. They came up to see us on the river. We were working very hard, we worked 7 days including rainy days. We were trying to do that whole job in one summer so we worked almost continuously. They flew in to see us along the river and we were actually about 20 miles further than they figured we would be. And of course, they were very complimentary. Ted Link and Art Noss ??? very, very human employers you might say. They were very, very appreciative of what people did.

SB: Were there any special incidents you can remember with troubles or anything, any encounters?

JA: Well yes, the biggest problems we had were the rapids. We didn't shoot the biggest rapid of all, the Grand Rapids. We spent about 3 or 4 days carrying our equipment around the rapids and lining our canoes. But we shot all the other rapids. We made the mistake of shooting the Little Grand Rapids below the main Grand Rapids, we thought we were over the hump. We did actually hit a rock but fortunately were able to right the canoe. I jumped out of the canoe and was able to push it back into the main stream. We made a hole in the canoe but we did get through there. We were also fortunate that Sam Bahan, the assistant, he was from Calgary and he had been canoeing at Bowness for years and year since he was a kid and he was an excellent, expert canoe man. So that helped us. But we went through and shot all these rapids. Once in awhile we did get hung up on some rocks and so on temporarily but we managed to get through. The other interesting personal encounter, it was towards McMurray, I left my canoe tied up and went and climbed up the hill to survey in some sandstones and I was coming back towards my canoe there was a bear between me and the canoe. I didn't expect bears out there. I sort of went around him and came up along the shore and without looking at him I just ran for that canoe and I pushed it and started the motor and just took off. He just kept looking at me. I was sort of trapped, I had to go for my canoe, I was trapped between a big cliff and the river there. So that worked out all right, the bear was pretty respectful. Very interesting feature is the gas seeps that you have at Pelican Rapids. There's a settlement at Pelican Rapids and that gas has been seeping there since the First World War anyway and they have a huge flame that burns that gas. They have nice gardens up there even late in the year, in the winter it melts all the snow around there. But it's quite an important historical spot in there, the famous Pelican Rapids gas seep. That's one of the reasons there's been a lot of exploration. They feel if there's gas there, there could be oil there too. Of course, gas is of value. As it turns out, there were a lot of gas seeps along the river that we saw. When we would be canoeing we'd see bubbles coming out of the bottom of the river and you could actually light some of these. So there are many, many small gas seeps all along that river. Very interesting. It's real oil country up there.

#170 SB: So did you decide to quit Bear Oil or was that just the end of the field season?

JA: Art Noss wanted me to continue working for him but I went on to Northwestern University. It was a good season, I made enough money that I could go to university for a year in Evanston, just in the suburbs of Chicago. I went down there because that was the leading school in lithologic and facees analysis of rocks. ??? mapping techniques were being developed there which are probably in the forefront I guess, certainly in North America, probably the world. [Crombine, Swath and Baffles]??? were the 3 professors that had published their work in that field so that's the reason I went down there. I decided to specialize in petroleum geology.

SB: So did you have any idea for a thesis before you went there or did that come out of your studies?

JA: I had mentioned I went to great pains to collect very detailed samples of the oil sands and the overlying beds along the Athabasca River and I hoped to use that as material for a thesis. But because that university was specializing in what they called regional analysis, in other words they wanted studies to be made of whole states or provinces so you could have 3 dimensional control. They suggested that I do a thesis covering a much larger area. Devonian was of great interest at that time because the reefs were making lots of news, the oil discoveries up here. But after the first year down there I was flat broke and the idea was to work on a thesis in the summer so I couldn't go back to work for Bear Oil, even though they offered me a job. They wanted me to go down the Peace River the next year but I couldn't do it. My professor called the state of Montana. He'd worked there for the government himself and I got a research grant, which was just a nominal amount, $400. It wasn't very much but it was quite a bit of money in those days, and then, although all the scholarships and fellowships were already gone at the university, when they realized that I was pretty indigent they somehow forced the university to give me the highest scholarship they had, which was $750. So I had accommodation scholarships ??? and I also got a small grant from Canadian Superior, $100 grant. With all that money put together I went out to do a thesis. Of course, I had to do it in Montana. But I expanded into Wyoming, Idaho, southern Alberta and southern Saskatchewan, to make it a regional thesis. The reason I was able to really do it, I had a good friend that was a student at Northwestern, he was from Michigan and he was also in the same position I was in only he was a war vet and he had a car and he had the government paying his tuition. So he used his car and we went to climb mountains sampling all these rocks and so on. He was very kind to provide me the car. And I helped him on his thesis, which was the Jurassic rocks and he helped me on mine, measuring and sampling my sections. Mine were Devonian which generally were in the tops of the mountains, his were near the bottoms of the mountains. That's what happens, the oldest rocks are usually highest up. So we had a very tough summer. We worked for about 4 months in the Black Hills in South Dakota, to Idaho on the west all the way to northwest Montana. We covered just about every mountain range in Wyoming, South Dakota, eastern Idaho and Montana. And then the last month I came up to Calgary and did the subsurface work of the central Alberta area and Saskatchewan.

#243 SB: Could you do any of that from material that had been published or was it all pretty well original?

JA: There was very, very little published up here, the only thing that was published was a description of rocks encountered in the discovery wells in the Leduc field by Imperial people. And in Montana my professor had published a paper on scattered mountains out there. The Williston Basin was very new at that time, it was just discovered so it was mostly confidential information at that time. I didn't even have the use of electric logs in most cases, I had to correlate my rock units purely on results of microscopic examination of samples. I didn't even have the benefit of electric logs. That was something that came later. Andrew Baillie did a similar study to mine at the same university a year later or so, but he had the advantage of logs in Saskatchewan and North Dakota.

SB: So it was pretty intensive work?

JA: Yes, it was quite pioneering because you are still. . . one of my biggest problems was to determine whether there was any Devonian in parts of southeastern Montana, from just examination of cuttings, which are very poor samples. So I had to work out to the limits of the occurrence of Devonian rocks and then you had split them up. So it was a very tough problem. Half the problem was to just be able to define the rocks and units you were to work with. And then the main job was to analyze the sedimentation history and to do the facees analysis, which is really what the main contribution was. But it was still an experience that was very instructive, good for your background.

SB: Did you graduate with a PhD the following year?

JA: Yes, in June 1951 I graduated and then I immediately joined Gulf Oil in Tulsa. The professors got that job for me. I wanted to come back to western Canada but the professors wanted me to work for Gulf because some of them were consulting for that company and they were just starting this kind of facees work that I had specialized in my thesis. So they wanted me to have this work continue. I did join that company on the proviso that I would be able to work on Canadian geology at least part of the time. So I worked there till 1954, I worked mostly on the Rocky Mountain area of the U.S., the Williston Basin. But I did a couple of major projects up here in Calgary on the Devonian, facees ??? of the Devonian, particularly in the Stettler, Fenn, Big Valley area. I did a very detailed analysis at that time, which was an important area for Gulf. But as time went on I could see that Gulf was giving me more and more remote areas, like the mid continent area, the Illinois area and they were talking about places like Kuwait and worldwide areas. So when I had the opportunity to come up here with a consulting company in 1954, I took that opportunity. Although the experience with Gulf was excellent, it was really the best job I ever had, it was an excellent job. I was working really on special projects, many of them that I could originate myself so I had a lot of independence.

SB: Was the research department at Gulf very large at that time?

JA: Yes, there was a research lab there and Dr. Charles Reineker was the director of the lab. I was his assistant there. We had about 20 people.

End of tape.

Tape 2 Side 1

SB: So I wonder if you could just also tell us how Gulf began, what it's relationship with BA was?

JA: When I joined Gulf in 1951 the local area in western Canada was not autonomous, it was run pretty closely from Tulsa, Oklahoma, which was the head office at that time for this area, the Rocky Mountain area. It was called Canadian Gulf Oil Co. at that time but Gulf had a big interest in British American Oil Co. which was a marketer. They always had a big interest in BA. Ultimately they changed their name to British American a little later and then of course, they swung back to Gulf. These changes didn't really involve any great changes except they wanted to tie in with the marketing closer. Ultimately it became just Gulf Oil Co. in the marketing too.

SB: Before that we were just mentioning the research department at Gulf that you were working with. How long did you continue with them?

JA: From June '51 to the end of 1953. Basically in the winter times I was in the lab, that's when most of the lab work was done. Everybody was working on material that they had collected in the summer in the mountains. Looking at it through a microscope, analysing it and mapping it and making these detailed maps, facees maps we were talking about earlier. Then the following summer the same thing happened, you would go out in the field again. So the lab portion was a winter operation and the summer most everybody dispersed in the field. That's when I went in the field too. The last year I spent, 1953, mapping, studying and collecting samples from Nevada in the south to Montana in the north. After that field season was over I resigned from Gulf. Alex McCoy was the exploration manager of Gulf and he's the one that hired me and he left Gulf to form a consulting company and he asked 7 of the Gulf geologists and myself to join the company as founding directors. Everybody joined pretty well. One of the offices was set up in Calgary, that's when I moved up here. Although my first projects were still in the Williston Basin in North Dakota, my first big project. Then we moved into the reef exploration area in Alberta.

SB: Who were some of the other 7 that joined Alex McCoy.

JA: Of greatest interest would be Ed Baltrisitus who was also an exploration manager for Gulf here in Calgary. He was the manager for McCoy here in the beginning. The others were all American geologists but later we expanded here and we got Ron Johnson, Terry Story, Alec Beverage, John Nisco and Ralph Edie to join the consulting company. The consulting company was very, very successful. They had offices in Tulsa, one in Denver, Casper and one in Calgary. They had very formidable clients because of connections Alex McCoy had. His father was a very famous geologist in the mid-continent area so he knew key people in the industry. But we could see after 2 years that the company was not run on the kind of basis that we liked it to be run, it's not a criticism, it's just their goals were different from what our goals were. We wanted to emphasize, we wanted to really become competitive, scientific consultants.

#052 SB: By we, do you mean the other . . .

JA: Ralph Edie and myself. So we left and particularly, some of the original policies of the company were changed, which we felt were not exactly what we had in mind, so we left on our own and formed a partnership. Really a joint venture but effectively a partnership, March 1st, 1956. In the earlier stages we did project work for all types of companies, from the major companies to the large independents to the actual individual just starting in the business. We were fortunate that one of our first major contracts was with Imperial Oil to do a very sizeable research project. It was really on the Wabamun???, D-1, they wanted a study made of the rocks in which the gas occurs in the Calgary-Okotoks area. So we did an 8 or 9 month project on that. They wanted a continuing relationship on other units but we had so many other clients that we couldn't take major projects after that. We had worked for companies like, initially, Imperial, Mobil, Amoco, Gulf and of the independent companies, Dome and Home, Occidental, Sol Petro, just about all the independents and a number of very, very small companies, some that nobody's heard of. But in 1958, late 50's, there was an ex-alderman from Calgary by the name of [J. N. R.]??? Morrison a company by raising money from farmers. Started right from nothing and he was one client that we worked for continuously. We did all the geological work for him, up to the end of August in 1981 when he sold his company for $87 million. Since then we've been totally independent. With this long term client whose exploration companies were called Thunderbird and Oakland??? Petroleums we started in the southeast Saskatchewan area in the late 50's, early 60's. Because you could sell all the oil you could find in southeast Saskatchewan so he was interested in starting there, he wanted cash flow. My partner Ralph Edie, did most of the work up there for him. And it did get him a good daily production in oil. The in about the middle 60's we were always interested in getting these companies to explore for reefs in central Alberta. We felt that there was great opportunity to find more D-3 reefs, particularly these 2 companies I mentioned that got production in southeast Saskatchewan. We had one particular ??? near Edmonton, near the town of St. Albert, that based on geology, indicated an oil bearing reef in a section out there that was right on trend of the Atchison, Big Lake, St. Albert reefs. A number of wells were drilled there but most of them were drilled on a seismic basis. Although they were all encouraging, were all suggesting that there was possibility of a pinnacle reef in that section, the reef only developed partly. It was only what we called a ground reef so that seismically it was very difficult to map with the old techniques. So really, you had to drill based on geology and some faith you might say. Because we had success in southeast Saskatchewan at that time, Mr. Morrison was willing to drill in these places that seismic could not delineate any reef, faith in our work you might say. And although it took 3 wells to find, we did find a pinnacle reef which had about 20 million barrels of oil in place in 240 acres. That's really what made the company overnight. He farmed in land from Shell Oil and Texaco and subsequently earned 100% interest in the whole pinnacle reef. It looks like that 240 acre pool produced anywhere from 12-15 million barrels of oil ultimately, a very prolific producer. So it was one D-3 reef that was found by pure geology and persistence. The people that had used seismic were actually drilling in the general area and getting close but the seismic was just not quite good enough at that time to map it. We have seen seismic done in recent years,

knowing where the reef is we can see it on the very modern seismic profiles. But of course, even to this day it would be difficult to find if you didn't know it was there, you'd have to be careful. But I mention this because it was perhaps one of the more interesting developments in the late 50's when we decided to go from research geology, studying regional areas to very specific prospects. We realized we had to do that in order to build a consulting firm that would last, that would carry you through the depressions as well as the boom times.

#134 SB: So that was quite revolutionary, your theory for detecting these or. . .?

JA: No, it wasn't, it was a very basic principle of petroleum geology. Reefs grow on platforms and the platform is usually 5-10 times larger than the reef. And the platform is maybe 100-150' high and the reef actually grows on a small portion of that platform and it goes, in this case, almost 300' high, in some cases, 600' high. In this area, on the updip side, on the northeastern side, we had encountered this platform buildup as we called it, about 150' of build up and it had about 20' of oil play in there, in that platform. That indicated that there was already a foundation for a reef. We knew that the oil, if it was present in the platform, would have to be on the updip side so the pinnacle, the reef would have to be downdip side, which was to the southwest. So we knew the direction and we thought it would be about a mile away, using the knowledge of other reefs in the area. But if you only have a 240 acre pinnacle, even knowing it's a mile away you have to be still, very precise. So the first well we missed it by less than half a mile, the second well we drilled because of land considerations but on the third well we hit right on and we were pretty lucky. Because we could even have missed it the third time. But fortunately we couldn't get all the land during the initial exploration well but after we drilled the first marginal well and the second dry hole, Texaco agreed to give us a farm out after we drilled a dry hole. So if we had found the reef on the first well we would have ended up with 30% of the oil, but by drilling a dry hole, Texaco figured that pretty well tested the area, they gave us the key quarter which had 70% of the oil in it, so we ended up with 100%. So there again, luck was very important. Interesting enough, the quarter that Texaco had held to the west turned out to be dry, the quarter that Imperial had held to the south was dry, and the quarter to the north which Amoco had, we drilled a dry hole on it, they did give us a farm out. But you can see, I just mentioned, 4 of the largest oil companies in the world had that land ??? and a small operator goes in. If you have a different idea, the idea was a little bit different in that, as I mentioned we thought the reef was a mile southwest or downdip from this oil show, in a platform. We stepped out a mile it put us half a mile off the trend of the other known reefs. So we had to drill off the trend. Even a good friend of mine, a geologist, when he heard about the location he called me and he said, what are you doing drilling off the trend. Now my partner and I have done the field geology on all these wells. In other words we did the well setting on all these wells, actually 225 wells in all that we've sat on. There's been a lot of time devoted to working in the field like that. But it's pretty lonely when you have an operator that doesn't really have much money, drilling an idea on a cold winter's night. You look at the starry skies and wonder whether you're leading them down the garden path. But

fortunately it did work out. There were other ideas that we thought were even better and later, didn't turn out, or that we had to find them a reef but we did not have a client that would drill that second well to get on the main reef. So although we found ??? but at least 2 or 3 other reefs like that, we were not able to promote additional drilling. We didn't have clients that had enough faith to drill the 2nd and 3rd well. These ended up being found by other operators which were not our clients but that's the name of the game I guess.

#198 SB: You did a number of publications since you formed the consulting company. Would you like to just run through some of those?

JA: The very first published paper was really my thesis, was in 1951, it was a regional stratigraphic analysis of the Devonian of Wyoming, Montana and western Canada. And the 1954 paper with John S. Wanfer???, who was a Gulf geologist, still with them today in Houston, we co-authored a paper on the late Devonian geologic history of the Stettler area, which was the area in which Gulf was very successful in finding a very large reef. Incidentally the recent discovery by Gulf in the Rumsey, Fenn area, which has been making all that news is really another little pinnacle that was passed up in the early exploration. Then I published on the Mississippian sedimentation of Montana and Wyoming. This was work that was done when I was still with Gulf and continued with Alex W. McCoy and Assoc. That was also a regional study. Then a paper in 1956 was published on the Wabamun group in the Stettler area, there again, with John Wanfer. But the really significant papers that were published were in 1958 on the stratigraphy and facees analysis of the upper Devonian reefs in the big Stettler and Redwater areas. And the second paper on the Cooking Lake, which is the platform to the reefs we discussed earlier, in the Edmonton area. Both these papers together were . . .the American Association of Petroleum Geologists awarded the Presidents Award for the most significant paper in petroleum geology published in the Bulletin in 1958. It was awarded in the spring of 1959. It's also interesting that that first paper, the first 1958 paper also was awarded the Medal Award by the Alberta Society of Petroleum Geologists at the same time. Today it's the Canadian Society of Petroleum Geologists. Then in 1959 I published on southern Manitoba, on the Ordovician and Silurian stratigraphy and sedimentation. Because I think we had a slack year so we didn't have that many clients so I did a research project. I realized that nobody had really done a subsurface study to tie into Andrew Baillie's surface work in the Lake Manitoba, Winnipeg area. So I tied the sedimentation of the subsurface to the surface area. It was just kind of a personal project and I tried to develop some new techniques of analyzing sediment. I also did work on different units that I hadn't worked on before, for experience. Then a 1960 paper on the Wabamun D-1 was a published version of the project I did for Imperial Oil 2 years earlier. In our contract with Imperial they agreed to release the study after 6 months or a year of exclusive restriction. 1961 was really the last significant paper based on very detailed work on the lithology and the fossils of the Dewhamel area. I felt I had evidence in the subsurface of faults controlling the linear development of D-3 reefs, particularly in this area. Many D-3 reefs have a north-northeast orientation in Alberta, which other

people hypothesized had been controlled by the north-northeast trending faults in the pre-Cambrian basement. I did this project to present actual subsurface evidence in the rocks themselves that that kind of movement occurred in Devonian times that helped to localize the linear aspect of these reefs. There were a couple of small papers in 1966 and 1971 published in the Oil and Gas Journal. The first one was a kind of historical presentation and description of the discovery of the Morinville reef that I mentioned earlier. And the final paper in '71 was a new stratigraphic technique to find these linear trends. Since that time we've been so occupied with so many different project, particularly with this one client that we've mentioned, this very successful. . . there's just the 3 of us that are doing practically all of the work in that company. It got to be a pretty substantial company so that took over 50% of our time.

#301 SB: Who was the third person?

JA: This J. N. R. Morrison with Thunderbird and Oakland Petroleums. Just the same the principles that we learned we applied in other areas. One notable example for instance, Bear Creek Mining Co. which is a subsidiary of Canacot??? Copper was one of my clients for several years. They found a copper deposit in a middle Devonian reef, in the Cobok River area of northwest Alaska, on the foothills of ???, near ???, almost the end of the world. But they had copper in a big massive linear reef front, very similar to oil occurring in reef fronts here in Alberta. So based on papers that we had published, I guess they'd heard of these papers and that particular company had a dispute between the research department and the operations department on the origin of the rock in which this copper occurred. So they engaged me for several years on that particular project but just a couple of weeks each year that I went up there to Alaska. I think we resolved that particular problem because it was quite clear that this was a reef front rather than an interpretive play. Some of the mining geologists said ??? diagenetic feature or metamorphic, diagenetic feature. Also, one other client was involved in Silurian reefs in the Michigan basin. It's ??? of Michigan, also I worked with them a number of years on the Silurian reefs that were found down there in the early 70's. I worked with them right from the beginning. That's been another quite important area for reef development.

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Tape 2 Side 2

SB: I wonder if you could just continue on with what you were mentioning before, work that you've been doing for your consulting company or whatever?

JA: One of the interesting developments of all our studies, many of which were published that really attracted a lot of workers from all over North America. . .well, ??? attracted but it certainly, there were a lot of workers that contacted us as to our methodology and corresponded with us on problems that they had in their areas and so on. And then universities had a number of students who were interested in pursuing work along this particular line because this kind of work was really leading to the discovery of quite a bit of. . . helping in the discovery of stratigraphic oil all over the world. It was a very

satisfying job to have people come to us and ask us our ideas, what would be an interesting thesis project. Just an example, Ed Klovan, who just actually left as head of the department of geology at the University of Calgary recently and went to work for Husky, was a young student and he came into our office and asked our advice about what to do as a thesis project. He was at that time studying under Norm Newell at Columbia University and Norm Newell was a reef expert in west Texas. And worldwide, he was a great authority on ??? reefs. Ed Klovan proposed the idea to us that he should study all of the reefs of the mountain areas of Alberta. Our first reaction was that no one person could do that and if you cover such a big area you're really not going to make much of a contribution beyond what's already been done. It would be a general reconnaissance study. We felt that the industry would benefit and the science would really advance if he studied in detail, some of the reefs that we had studied which we thought were detailed studies but were just at the very pioneer stage. Particularly Redwater reef, we found out that there was a lot of core available. Hundreds of wells were cored. So we suggested that he study the Redwater reef. He was quite hesitant at first but at any rate he did undertake the study. Some of the other oil companies sponsored, helped him in giving him summer work and so on, on that particular project, giving him data. And he did produce a masterpiece, a facees analysis of the Redwater reef, studied the palaeontology???. And it is a classic volume, it's probably a landmark publication really on the upper Devonian reef facees. I think it certainly enhanced his stature as a scientist, it's recognized as a very key contribution in the field of science. So we've always tried to encourage further studies along this line. It requires a much more specialized study of fossils and textures and techniques than we were able to undertake in the earlier days.

#058 SB: A lot of companies have benefited from your initial studies then, in following them up and possibly making major finds?

JA: I think one of the key features of our work, many geologists were doing this kind of work. I could name 25-30 people who specialized in this kind of work but unfortunately not too many of them have published their findings. Now we've always believed, whenever we have a significant idea that can be of help to others, we've always believed in publishing it. It's a great thrill to publish and to have people appreciate a new idea and have them criticize a new idea. And also, if you're in the consulting field and it's a highly competitive field like this, by publishing we were able to open up a lot of clients worldwide which we wouldn't have been able to do otherwise. So by publishing I think that perhaps our work has benefited a lot more people than the work of say, other geologists that haven't published that have done equally or better work. So I think that the fact that it was published has made quite an impact. I've always believed that an idea that is good and new should be really published because it's good for society. I know there are a lot of companies that are very secretive and so on about publishing results. But this has never bothered us because by the time we publish something it's usually 3 or 4 years after we've done the basic work. And if you can't take advantage of it in 2 or 3 years, you're pretty slow, you probably won't ever be able to take advantage of it. So I don't think that secrecy is very valid. But it is an excuse. People use that as an excuse for

not publishing because they say, the company won't let me publish. That's a little bit of philosophy but I think it's changing. There's a lot of very, very significant papers being published very early nowadays, very fast. I think the companies have changed that secrecy aspect quite a bit.

SB: I guess one question that a lot of people think of with your firm is, they realize that you've been successful in staying together for, is it, 27 years, is there any reason you can say that it was successful for that long? It must have a lot to do with your personalities and your objectives being compatible.

JA: I think there's just one word that would explain a successful partnership of over 25 years and that is respect. When 2 individuals have respect for each other, and I think that's got to be true of any kind of relationship, even man and wife, as long as total respect is there it will last. There is absolutely no reason for that relationship to not go on for as long as time will permit. I think that's a very important aspect of it and I'm afraid that we can't point to many. There are so many partnerships that have foundered, from some of the first afternoon it was formed to 5 years later, 10 years later, 20 years later. Partners can even have different objectives, we do have quite a different objective. We are a joint venture, we still are independent of each other. Each partner can do whatever he wants in addition to what he does as understood by both partners. But I think you also have to recognize that a partner's contribution, particularly in this kind of field, may not come at a time when he's working hardest. Over the 25 year period we have found that our individual work has produced results sort of alternately almost, so it's worked out very nicely. Both have made real contributions. And it's hard to define what a contribution is. If one partner will do, sometimes a lot of the busy and dirty work sometimes, and still be respected, the partnership will really gain from it. So I think it's mainly, it's respect. You have enough respect for a person that you don't try to judge the value of his work. We've always felt that it was a 50-50 partnership, that's been a key. I think the other aspect is Ralph Edie really is a top notch scientist and a very honest individual, a very humane person and I think he really creates pride in whatever organization he's associated with. It really is that simple. You can't help but respect an individual like that.

#128 SB: Are there any other things that you'd like to mention?

JA: You mentioned earlier about the most significant or interesting developments, that is I think again, the probably most interesting event in my career was when I was sitting on the well that discovered that reef. It was a very cold winter night, 35 below zero, and the wind was blowing 35 miles an hour so it was pretty cold out there. In the middle of the night I suspected from what was happening up the hole that we were probably going to get a reef but you're never sure until you drill into it. We drilled into the reef and we started getting little chips of dolomite and they had bubbles of oil in it. We were looking at the samples just as they were coming right out of the shale shaker. It was interesting, I knew immediately that we had over 125' of oil play in there, it was that much above the water level. So that was quite a thrill to have that happen because we had a lot of faith that the reef was there but we also knew that we could miss it by several hundred yards again. So experiencing luck in the oil game was pretty important in other words, I think

luck is an important aspect. I think if you drill enough wells you're going to have luck, it will be on your side. You don't have to rely on luck, if you have enough statistical chances. On the other hand I've been sort of disappointed in some of the geologists because although they understand the oil business, they would still like to find a discovery every well they drill. But a dry hole or many dry holes sometimes are very, very key to a discovery. You can't make a discovery unless you get the dry hole. The dry holes give you the information that lead to discovery and an abandoned dry hole has never really ever made me sad. And I've told the clients this because they give me more information. You'd be happier with a discovery but it generally gives you the information that leads you to the discovery. I think that we've always got to have that kind of thinking that every time you drill you are really coming closer to the discovery and these dry holes area almost a prerequisite to making big discoveries.

SB: Is there anything else that you'd like to add to the record?

JA: That should catch the main highlights.

SB: Well, it's been very interesting. I'd like to thank you for sitting through it and telling us about your experiences.