

THOMAS DAVID BROWN

Thomas David Brown was born in 1935 in Forest Hall, a suburb of Newcastle-upon-Tyne, United Kingdom and received a BSc degree from the University of Durham in Special Honours in Chemistry in 1956. He went to work for the National Coal Board in Tyneside in their scientific department. He returned to University in 1960 and obtained a doctorate from the University of Sheffield, School of Fuels, one of three that exists in the world with that specialization. His thesis dissertation was "Combustion of Heavy Oil." He continued with some postdoctoral studies and then, in 1972, came to Canada to work for the Canada Centre for Minerals and Energy Technology as a Research Scientist in the Combustion Laboratory of the Department of Energy, Mines and Resources. The laboratory was on the outskirts of Ottawa and about 300 researchers worked there in a number of specialized laboratories including explosives, upgrading, combustion (now the Energy Resources Laboratory). Among the research projects were some relating to the upgrading of oil sands bitumen to marketable products. In 1983, the governments of Alberta and Canada created the Alberta Canada Energy Resources Research Fund (ACERRF) agreed to by Prime Minister Pierre Trudeau and Premier Peter Lougheed. Brown came to Alberta to set up the CANMET Energy Technology Centre in Devon. The facility is wholly-owned by the Province of Alberta and was built with monies from ACERRF. Brown headed this facility from 1983 to 1995 and there were a number of achievements. Among them he notes the fact that the facility was started from scratch and still persists with two directors following him (Bruce Stewart and Hassan Hamza) as well as the range of successful research projects involving industry. Progressively, they created more and more, stronger and stronger links to industry. Among his teams' achievements is the establishing of the big Tar Sands Tailings Research Program, which was a joint CANMET/NRC/ARC/industry initiative. The companies included not only Suncor and Syncrude but also later developers such as Exxon. They took the first steps in how to deal with tailings.

Date and place of birth (if available): June 8th, 1935, in Forest Hall, a suburb of Newcastle-upon-Tyne, United Kingdom

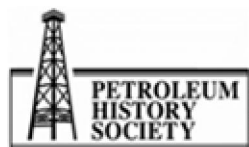
Date and place of interview: August 14, 2013 in his home in St. Albert, Alberta

Contact Information:

Residence:

David Brown
Apt 104, 35 Sir Winston Churchill Avenue
St. Albert, AB
T8N 0G3
Tel. 780-460-2993
Email: onebrown@telus.net

Name of interviewer: Adriana A. Davies, CM, PhD



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



Name of videographer: Jimmy Bustos

Full names (spelled out) of all others present: N/A

Consent form signed: Yes

Transcript reviewed by subject: Yes

Interview Duration: 1 hour and 22 minutes

Initials of Interviewer: AD

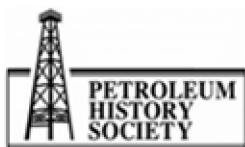
Last name of subject: Brown

AD: My name is Adriana Davies and I'm a Researcher/Interviewer on the Petroleum History Society Oil Sands Oral History Project. Today is August the 14th and it's 1:20 p.m. and I'm interviewing David Brown, the former Director of Canmet Energy Technology Centre in Devon, Alberta. David, can you tell me a little bit -- thank you, first of all, for agreeing to be interviewed and could you tell me your place and date of birth, and then a summary biography before we get into the guts, as it were, of your working life.

BROWN: Yes, certainly. You can tell from my accent that I'm not Canadian born, that I was born in England, and that was in 1935, and all of my education was in England. I read chemistry at the University of Durham, but before I'd even got to university I spent a summer working underground as a summer student in coal mining. And coal mining has a place in western Canada and that it has ... a relationship to oil sands, which is the main subject that we're looking at today. I completed my degree and then I worked for four years in the coal industry; returned to university to do a PhD in chemical engineering, and that was really when I first had the first meeting with the words oil sands, tar sands, whatever people choose to name it. That was because I was doing combustion research involved in the behaviour of the impurities in oils. One of the impurities was vanadium, and it so happens that the highest concentration of vanadium, which is a very corrosive -- can be a very corrosive metal -- occurs in tar sands and it does limit the use of heavy oils.

In that time, I worked in conjunction with the Canadian Navy and the American Bureau of Ships, the American Navy. That put me in contact with what was then the Department of Mines and Technical Surveys of the Government of Canada, and after a few years I made the transition from being an English academic to being a federal bureaucrat researcher, scientific researcher in Canada. I joined the Combustion Research laboratory in Ottawa after a decade ... as an active scientist when there was more and more involvement in the tar sands and the use -- the upgrading and use -- of the products from the tar sands.

I came out to western Canada to establish a new laboratory that encompassed the laboratory, which is now at Devon, another laboratory which originally was in Calgary but was later transferred to Devon, and a third laboratory which was in Cape Breton. This covered the breadth of coal mining



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



in Canada, which was the experience I brought here. That laboratory is what you now see as the Devon Research Centre, which houses an organization that I was responsible for founding together with branches of the Alberta Research Council, and nowadays is almost exclusively focused on research into issues surrounding the use and remediation of problems from the -- from the tar sands.

Nowadays that laboratory really, I believe, has a 100 percent focus on tar sands issues of all kinds, and of course predominantly what do you do with the massive amount of sand that is extracted in the mining process that produces the bitumen, which is eventually converted into liquid fuels? And here I am, after all that, retired.

AD: Okay. I'm going to back up a little. So you went to the University of Durham and obtained a BSc degree in Special Honours Chemistry in 1956, and you then worked for the Coal Board in Tyneside in their ...

BROWN: Yes.

AD: ...scientific department, and in 1960 went to the University of Sheffield for a degree in chemical engineering. Now, you had mentioned to me that the School of Fuels ... at the University of Sheffield was unique and can you talk a bit about that, because, of course, you know, this was your intellectual formation and formation as a scientist that then would make you valuable in terms of the work that you would later do. So do you want to talk about that?

BROWN: Yes. The School of Fuels is actually called Fuel Technology when I started there in Sheffield and was one of -- I call to mind three others in the world, one of which was in Penn State in the United States, and another of which was at the Massachusetts Institute of Technology, and a third was at Sheffield. The total concentration was on all aspects of fuel processing and use. Not so much on the production of fuels; not so much on, for instance, in coal mining; not in terms of oil exploration, but in terms of oil combustion and use, and in terms of coal conversion to liquids or use in power stations; and, similarly, for gas -- very little about exploration, always about use.

AD: And so, you know, in terms of ...

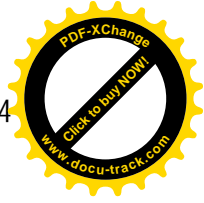
BROWN: And ...

AD: ... combustion, you talked, you focused specifically on that. Why was that?

BROWN: Because I think the -- if I go back to think about the title of the thesis that I wrote, it was *The Behaviour of Impurities in Fuel Oil During Combustion*. My prime interest were three impurities, one of which you hear an immense about nowadays; one was sulphur and all of the sulphur dioxide acid rain problems are associated with what happens to sulphur during the combustion process of either coal or oil. Secondary interest, but in terms of public concern, was the presence of vanadium, but perhaps a more important concern to the user because vanadium, in a combustion process, arrives on any metal surface that its confronted with, and vanadium converts to an oxide and it's highly



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



corrosive. It eats away at boilers; it eats away at metal. So those were the aspects of combustion that I was specifically interested and, as I said, vanadium is present in very high concentrations in tar sands. It's not a highlight problem largely because ways have been found in the intervening 40 years to circumvent the problem and, indeed, to overcome it. But the sulphur problem remains. But that was my introduction to the engineering of fuels in all aspects.

AD: Now, tell me a bit more about that trilateral project, Canadian, American and British that ultimately ended up in your coming to Canada.

BROWN: The problem of these impurities in fuel oil in naval boilers became very, very intense in the sixties and early seventies. Naval boilers have one or two very specific design criteria that exacerbate the problem. They're tiny by comparison with a power station boiler, and yet they produce as much steam as a power station boiler. That means that everything happens in a much more dramatic fashion at higher temperatures and in enclosed space. And a ship at sea is also exposed to using a combustion air that has salt in it, sodium, because that's what brine is, that's what the seawater is. And that, in its own way, exacerbates the problem. In order to find ways around this, the Canadian Navy, the British Navy and the American Navy formed a research program that brought together three different arms of researchers in the three different countries into a combined program, each of us doing certain things but in constant contact and frequent -- relatively frequent -- meetings with each other to keep the projects going. It really would be called a project management system. Everybody knew what everybody else was doing and that put me, for the first time, in contact with the Canadian researchers who were based at -- in Ottawa -- in the Department, Mines Department, now Energy, Mines and Resources, in the National Research Council and also in the American Research Centre at Annapolis, the Bureau of Ships.

And that led me to personal relationships with people in the two countries, but also with an understanding of some of the institutions that were there and some of -- eventually I thought the time came to, to perhaps make a personal change but retain the intellectual interests that I had developed expertise in.

AD: So what was the offer that brought you to Canada and who made it and when did you come to Canada?

BROWN: I came in 1960 -- ooh, I have to work it out -- 1972. And it was an offer from the Department of Energy, Mines and Resources to come and work in what was called the Canadian Combustion Research Laboratory -- was a branch of what had now become the Department of Energy, Mines and Resources. It had a new facility on the outskirts of Ottawa, one of the most physically attractive laboratories in the world I would always argue. It was built around an old quarry from which the stones that built the Parliament buildings in Ottawa had been hewn, and it was -- like the whole of that area -- it was the most magnificent place to be in the autumn. Not so nice in the depth of winter, but in the autumn it was glorious.

AD: And so you were hired to do what specifically?



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



BROWN: Basically, combustion research -- of any kind; it so happened that the first fuel projects -- and indeed for several years I became the leader of research projects in residential heating. In Alberta, it sounds strange, but very few homes are heated by oil, you know, which is where the oil lives. In Ontario and in Quebec and in the Maritimes many, many homes are heated with oil-fired residential heating. I was a combustion engineer and I had the job of doing some -- all kinds of research associated with designing new oil burners for use in homes, but more importantly for studying how the homes and the heating system and the climate interacted, and how indeed common, personal habits in a house can modify heating bills, and that research resulted in a book that went out to a million homes in Canada; the book was called *How to Save Money on Your Heating Bills*. I have one copy of it here. It was ...

AD: [Is it still used?]

BROWN: ... it's a souvenir now; it's clear times have changed, although most of the principles that were enunciated in that still go. And that also brought me in contact with the oil industry because all of the fuel supply in eastern Canada comes through the major oil companies, who of course are the same companies that are involved in western Canada. It led to a lot of other things that were fun to do. It led to annual broadcasts. There used to be a program on television called -- that was introduced by Stompin' Tom Connors. It was a program about general interest in technical things about your own -- about your own life -- and once a year the producer rang us up after his first year and said have you got anything that's worth -- that is interesting that we can run a program?

So I did some broadcasting then, one of which I remember -- I was not really keen on the idea, nor were my bosses, but we did it -- in which a house was selected at random in Toronto. I was sent in to measure and establish the efficiency of the combustion system in that particular house and to document it, and then later in the day a serviceman from the local service company came in to do the servicing that was needed on contract. He left and I was then back in to reassess and try and -- to come up with a -- not a judgment, I think that would be a bit taking it too [far] -- but to comment on what had happened: what was good about what had happened and what is bad about what happened. And I ... I did and it all passed away and it was very straightforward, but ... having to make that kind of comment ...

AD: Yeah.

BROWN: ... in very much, on national television, a very popular program, really was not something that I enjoyed doing. Perhaps it stood me in good stead, I don't know, but having done it once it gets easier the second time.

AD: So, in a sense, it was like reality TV today.

BROWN: It, in essence, it was a reality TV show ...

AD: But it was about ...



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



BROWN: ... in a very limited technical field.

AD: Yeah. But it was about energy use and efficiency ...

BROWN: Yes.

AD: ... and ... so on.

BROWN: Yeah.

AD: Did you get involved at all with oil sands when you were -- those ten years when you were in Ottawa?

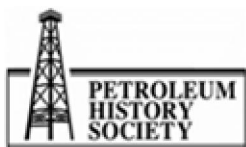
BROWN: Yes, yes, it ...

AD: So can you tell me about it?

BROWN: ... the way it -- the way I moved towards oil sands was because -- the year would be 1973. I hadn't been here very long but that was the year of the Arab oil crisis. I was concerned with, in addition to what I've already mentioned with the research into how you convert coal solid fuel into a liquid fuel; and the oil crisis provoked a surge of activity all around the world in what was called coal conversion. How do you convert coal into a liquid fuel? Canada started off with a tremendous advantage in that particular field because the intermediate steps of producing a liquid fuel from coal essentially produce a bitumen that is very, very closely similar to the bitumen which is extracted from the tar sands. And I was then involved with people in my own organization and people who were doing research on contract in Alberta and in Saskatchewan on the conversion of bitumen -- heavy, very heavy oils -- to lighter and more marketable commodities for use in, well, in the end, in automobiles in the market that existed for conventional fuel oils. So I got that -- that step ... that step bridged me into tar sands and liquid fuels from tar sands.

AD: Now, did you have anything to do with the various AOSTRA-funded research programs?

BROWN: Not directly from Ottawa. That really didn't occur until I was in western Canada. What I did have to do with was something called the Alberta/Canada Energy Research Resources Fund, which came about from the oil crisis but was something which basically said -- philosophy which said -- what are we going to do if the oil runs out? What alternative energy resources have we got that we can use? And it was convert -- concerned -- I'm sorry, a lot with converting coal into oil. AOSTRA, because of this bridge, because of the similarity between the first, derived liquid from coal and the bitumen, there's an overlap; there's an overlap in the chemistry; there's an overlap in the technologies that I used to upgrade things to commercial products. And, although I wasn't directly involved from Ottawa, as soon as I was in western Canada then it became -- the most important single element in anything that I was doing.



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



AD: Now, there was a politically-motivated reason for you coming out to western Canada and you've talked about the oil crisis and that, and I'll spit it out -- the National Energy Program ...

BROWN: Yeah.

AD: ... and so do you want to talk about that?

BROWN: The National Energy Program did precede me, but I do remember being very conscious of the attitudes that were about, in Alberta, about the National Energy Program. I came to it a bit naively, I think. I didn't understand the depth of the feeling that the National Energy Program had produced in Alberta. The thing that I recognized about the National Energy Program was that it put an immense amount of money into energy research of all kinds, essentially federal money. Well, therein lies the argument, of course. Was it federal money or was it foregone Alberta revenue?

AD: The royalties.

BROWN: ... royalty revenue. And that's a large element of the unhappiness about it. But it did put a lot of money into research and development of all kinds. It sponsored research in Alberta in, on coal technology; in the conversion of liquids to -- sorry, solid fuels to liquids; it sponsored research into alternative methods of generating electricity because in those days that was -- the words combined cycle power generation were unheard of in Canada. So from the researcher's point of view, which is distinct and different from the political point of view, all I could see were good things in it. But I did park my car carefully if I was using a government car that said the Department of Energy, Mines and Resources.

AD: So then, what was the agency and the pot of research funding that was created?

BROWN: Well, ... the federal and provincial governments created a fund called the Alberta/Canada Energy Resources Research Fund and it was in excess of 100 million dollars. It was federal transfers of dollars from the federal royalties on exported oil that was fed into the -- to the Alberta Department of Energy, and was managed by the Alberta Department of Energy to cover all kinds of future, forward-looking research programs -- a lot of them to do with coal; a lot of them to do with non-conventional methods of power generation; not too many of them to do with heavy oil because Alberta already had its own organization, which was AOSTRA, and this fund was very careful not to overlap with AOSTRA-operated research. To avoid that, it was in fact administered entirely by the Alberta government. It was a federal -- it was a cash transfer, but that cash, it was a quid pro quo, it -- and Alberta might well say it was a trivial quid pro quo, but it was a solid form of quid pro quo for the energy research, for the National Energy Program.

AD: So then what specifically brought you out to Alberta and when was it and what were your duties and responsibilities?

BROWN: Well, it was '84 and the Alberta[/Canada] Energy Resources Fund -- ACERF -- has in its course of, its early existence, created three new research organizations, one of which was the Coal



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



Mining Research Centre, and two of us were in Calgary were oil sands-related, but it had also built what is now the Devon Coal Research Centre building. That building is owned by the Alberta government. It was built to house three organizations: the Energy Research Programs of the Alberta Research Council; the research programs of the Coal Mining Research Centre, which was ACERF-funded; and the Energy Research Programs, what is now the Western Research Centre of the Canada Centre of Mineral Energy Technology. That's what I -- and it was that federal branch that I was sent out to create by amalgamation and by recruitment; and it, it still survives.

Since its foundation in -- I think the building would be opened in -- it was probably opened in '84, September of '84, its occupancy-level has continuously over the years increased, but the distribution of where the people and researchers come from has changed. The Coal Mining Research Centre no longer exists. Its peer organization, the Petroleum Recovery Institute in Calgary still exists. Alberta Research Council of course still exists and its role in that research centre over the years has, generally speaking, decreased but it is, it's still there and is now ... that centre operates a combined research program [that] includes the federal government unit, the Alberta Research Council unit and a lot of industrial researchers because they come to work there because, overall, it's probably the best place in the world to do oil sands research, partly because of its location but partly because of the people who are there.

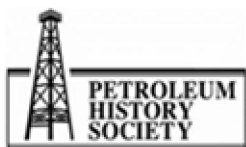
AD: Now of course, that was not the situation when you arrived. I mean the focus was on coal ...

BROWN: Yes.

AD: ... but then how did the shift -- how and why did the shift happen away from coal?

BROWN: Well, it -- it arose I think basically from one examination that several of us made of -- if, if you like, navel-gazing about research and development, and we ... were looking at what kind of technologies will Canada need for the future, and where will it get them? And it was very clear to us that there is a lot of coal in the world and that coal -- the research in that coal -- had, as a consequence of the energy crunch of the seventies, had expanded. So we now have countries like -- not so much China, but India, Japan, Germany, UK, Australia -- involved in massive research and development programs in all areas of coal utilization.

We could've been part of that but, looking at things, we could not see any other countries, maybe one, maybe Venezuela, that was going to be directly involved in research and development for the tar sands. And it made a very simple argument, and it made absolute sense that the federal government research effort should focus not on coal but on tar sands; a deliberate decision to -- if need be -- buy in the coal research. But where to buy tar sands research, there was no one. And I think the Alberta -- AOSTRA -- certainly held, had held that view and the combined efforts of AOSTRA and the Canmet group have -- in fact, I, in my eyes, demonstrated that was ... with hindsight -- was a good decision to make at the time; good decision for other reasons. Another reason is that its location in Devon is right in the heartland, in the origins of Alberta's oil industry. It really couldn't be anywhere better; well, Fort McMurray, people might argue the toss about that,



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



but it's the right place to have a centre doing that kind of research. It allows the people who are running a plant of any kind to come in and talk about ideas that they have to find out what -- and to keep the researchers, if you like, on a track that is feasible.

AD: So who actually made the decision or recommendation?

BROWN: I think it was made by the federal government perspective; I think it was made by myself, Hassan Hamza and Bruce Stewart, who were the two senior managers who were working with me in my organization at that time. It's like saying who are the influences on a writer? It's never 100 percent clear but I know, I can in fact remember the afternoon where we decided that's what we've got to do. We then had to sell it.

AD: And how did you sell it?

BROWN: Well, we were helped by the events that went on in Alberta really because it coincided with the move by the tar sands operators --- and only Syncrude and Suncor [at the time]-- to create an awareness in Canada of what the tar sands was about. Previously, it had only been an awareness in Alberta, and there are a lot of people were involved in creating that awareness over a quite long period of time, and it's certainly four or five years. It was not something that happened in the twinkling of an eye, and we probably maneuvered ourselves towards, towards the objective that we had.

It was -- it was accelerated a bit by a closure of a laboratory in Calgary which had been dedicated towards coal and coal mining but was finding life very difficult. It couldn't sustain the industrial interest that was necessary even then to justify its existence, and that meant that some people were becoming available that would not have -- and that helped our transfer towards tar sands.

AD: Now, in terms of the federal government's involvement in oil sands research, of course we think of [Sidney] Eills, and, and [Karl] Clark and, and that early era. Now, it's my understanding that after the Blair Report and the 1951 symposium that the Premier -- Premier Manning -- felt that the companies at that stage should take over, you know, the initial research proving the feasibility of extraction had been done and that commercialization should be led by the industry. Now, did the federal government continue oil sands research in Ottawa, or any other laboratories, when effectively it went on the back burner of the Alberta Research Council and ...

BROWN: Yes, it did. The federal research laboratory, what was called the Energy Research Laboratories where I was in a combustion research group, had a parallel group who had developed a technology for the upgrading of tar sands bitumen -- something that had been embryonic in Karl Clark's earlier days when he was in Mines and Technical Surveys in Ottawa, something that stemmed from that. It was about how, how this albeit reluctant material, how it could be converted to something, and an idea had been esta -- was established in Ottawa that I think was held by a lot of -- held a lot of patents that an upgrading of tar sands bitumen could be achieved by adding a certain amount of coal as a catalyst to the process, and it was that basic -- that basic idea was pursued in Ottawa on a fairly low-key level until the 1980s. It did eventually result in an upgrading process



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



being installed. It was -- it was designed to handle -- that was designed to handle both tar sands bitumen and the heavy oil, which occurred naturally in other petroleum products. And that particular technology was indeed implemented in a refinery in Montreal, not to any great significant industrial scale, but nothing like the scale that was necessary for tar sands. That had been going on in a relatively low-key way.

Some years after we had taken a decision to redirect our efforts from Devon, we were presented with an opportunity, if you like, to restate our view that Devon was the best place -- that Alberta was the best place to be doing this kind of research, and that view was accepted and we were able to transfer that group from Ottawa -- some, a total of about 35 researchers, which is a significant research team -- to come out to Devon and to join the group that was already there to create a research centre that held now the research into the whole panoply of activities after the mining process -- anything to do with separation of the bitumen. But also newly, with these new people, anything that had to do with the upgrading of that product to a market commodity. So the whole range was now covered in the federal laboratory. That was strengthened even further by the expertises that were brought in from the Alberta Research Council; and it continues in that mold covering the entire range of activities that the tar sands involve.

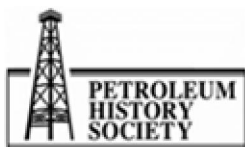
AD: Now, give me an idea of the size of the facility, I mean, you know, physically, its annual budget, research staff, etc.

BROWN: I can really only speak about the time that I was there.

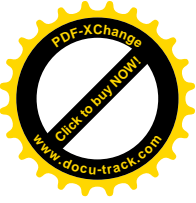
AD: Yes, yeah.

BROWN: The federal budget the time I was there ran typically between 30 and 35 million dollars a year; the federal staff, who were there at the maximum was 120. It was supplemented with transient -- of the staff, visiting professors, whatever from universities all over Canada, but also around the world. Out of that, in addition to that 35-million dollars, in-house budget, it was a budget that could be used to let contract research out to universities or industrial companies in Alberta. And it was, it was that kind of activity, this combination of in-house research and letting out of contracts that led, I think, to the biggest change that -- and the most welcome change from researchers' perspective -- that happened in oil sands research in Canada. It was the start of an era where people were starting to do everything but were also prepared to share it, because people were coming in to join this group; people were coming in from oil companies, from the tar sands operators, were working side-by-side on occasion, but certainly on a continuous-contact basis with the -- with the researchers.

And one of the big stresses of the Alberta tar sands industry from a researcher's point of view is that it's exemplified by the fact Syncrude research existed before Syncrude existed and that's the way it should be. When Syncrude exists, you don't discard Syncrude research, it continues. But the point about that is there's a proximity. It's the same umbrella and that's one of the big advantages that an industrial organization can have over a government organization. You have to have something that is integrated, something that takes the idea that maybe comes from the research bench, and criticizes



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



it and modifies it and molds it and moves it. And you have to have the research bench looking at what is practical. And that eventually became some of the most, in my view, successful research programs that were handled in western Canada in association with the tar sands.

And I'm -- you may have heard of some of them, I'm sure; the first one -- first one that I recall -- was the Tar Sands Tailings Consortium, which was about -- the name is quite explicit that a lot of tailings come out of a tar sands bucket load; I think 80-odd percent of it not useable directly in producing bitumen, so you have to do something with it. But you have to separate it, so there's a whole issue -- all of the issues surrounding the tar sands tailing. That was a first collective research program; it involved AOSTRA; it involved the federal government; both of those two providing money for research. It involved the Alberta Research Council and the Can -- Canmet Laboratories providing research capability; and Syncrude research providing research capability; and Syncrude and Suncor providing on-site expertise and facilities. And that's a start of what has continued and is probably the best feature about -- well, I say, the best because I was there at the beginning -- but it's a pivotally-important feature in getting research from an idea to something that is used either for the public good or for the corporate good.

And it's ... that's what -- I know I've talked in the past about current, 2013-preoccupations of the present -- of the National Research Council -- about getting ideas into use and borrowing ideas from practice from industry. That's the most difficult part of doing research -- getting -- is making that bridge at the beginning, holding it through to the end. And, I think that's -- there are other things that happened since then that follow that pattern that, I think, are being, generally speaking, very, very successful and bode well for continued activity.

There's another one, it's CONRAD, which you may -- the acronyms are, well, it's the Canadian -- I think its name has changed now -- the Canadian Oil Sands Network for Research and Development. But what it is, is an organization that says "Let's talk to each other about what needs to be done; what we are each doing; and let's share the outcome; and let's pay for it together; and everybody puts on the table what they can."

AD: Well, I remember, you know, the first four years of the 1980s. I was Science and Technology Editor of the *Canadian Encyclopedia* commissioned to [concentrate]...

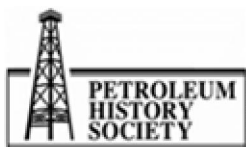
BROWN: Yeah.

AD: ... on this stuff; and, of course, the buzz word was technology transfer from laboratories, whether they're government laboratories ...

BROWN: Yeah.

AD: ... or university laboratories to industry, and of course you've mentioned that it's come around, I mean it's, you know, Alberta Innovates ...

BROWN: It's -- yeah.



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



AD: ... Energy Futures, whatever, it's become current again. But what you've articulated is that this research works when you have an entity, in this case a physical laboratory, that brings together the researchers from federal, provincial government, academe, with industry together and where you work collaboratively to create and design, and design new processes that enhance the industry's capacity to produce more marketable commodities.

BROWN: Yeah, I think that's true. The way I've expressed it perhaps puts an emphasis on the physical.

AD: Yes.

BROWN: And I, I do believe that that's important because it facilitates what is the much more important interaction that is between the brain of -- between the researcher, between -- and the experience of the operator; and it brings -- it's quite difficult to do that in the interruptible way that you get by going on visits -- now you've got to remember I was doing these things just at the advent of the Internet. It wasn't the tool that it is now, and maybe my views are a bit conditioned by pre-Internet history or my own history, but I think the physical -- the physical presence of somewhere where everybody could come in, particularly what is in essence a neutral centre in the sense that it's a government, a government centre. It's in Alberta,; it's owned by the Alberta government' and it's staffed largely, currently by the federal government and the Alberta government. That imposes a neutrality that might not be there if you held it in Exxon, in Syncrude, in Suncor, in Sun Oil. I found that it worked and I ...

AD: Well, if it was housed -- if it was a research establishment that was proprietary to the company, you wouldn't have the collaboration.

BROWN: Collaboration would be much more difficult to establish, I think.

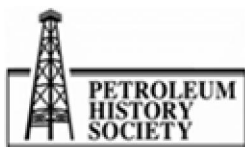
AD: Now, you know, looking at what the economics of the industry was at that time, the 1980s, you have two players -- Suncor and Syncrude -- and they're barely making ...

BROWN: Yes.

AD: ... any money. So there was a huge leap of faith, I mean, and you have to go back to Premier Lougheed and the creation of AOSTRA because it is the continuous funding of research and the building of the critical mass of researchers and scientists that enabled those breakthroughs that are, that are the direct cause of the success of the contemporary industry. Do you want to talk a bit about that?

BROWN: I think the -- I don't think there was any, ever any shortage of optimism within the industry.

AD: Okay.



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



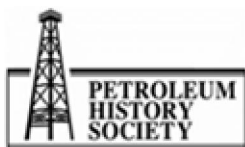
BROWN: I, the oil industry has a history and it's a very personal view -- it has a history of having, if you like, brutally-made money from research and development. It knows that it can be done. Just like the United States knew it could put a man on the moon in ten years, and I'm sure -- that belief that is based on history and knowledge is carried forward by people's imaginations. And, I think, I don't think that ever disappeared in Alberta; I don't think it ever disappeared in AOSTRA; I, but more importantly, I don't think it ever disappeared in the parent companies of Syncrude, for example. The oil companies that have this record and Suncor, I think the same applied; a company that has a record of having taken research and development to a huge industrial process, even before the tar sands. Not as big as the tar sands but nevertheless huge by the standards of the day, and having a return on its research investment. I -- and I think that optimism sustained a lot of things in Alberta.

I think there was one other thing happened a little bit later. It happened in my time, so I'm now thinking about the eighties. I think the message that was put out by, in my view, the leader who stood out to me within the industry was Eric Newell. The message that was put out nationally by Eric Newell was not one about the tar sands; it was one that said this is Canadian and this impacts the whole of this nation, and it produced the acceptance of -- that view was influential in allowing subsequent politicians to create revenue, revenue rules that encouraged the development. There's no question about that; but that it was seen to be a, if you like, "What is this, the use of the programming; only in Canada, eh?" It conveyed that impression and that made a big difference to the feel, to everybody who was around about the industry at the time.

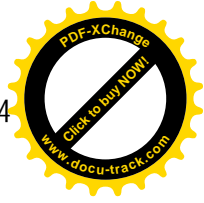
I think it made a difference to the researchers who felt -- who could see that there were other parts of the industry that they were working with, were doing things that researchers could never do. You can't -- researchers hardly ever influence politicians. But industrialists do, and visionaries do and I've -- I think that had a big impact on what happened in the, well, let's say in the years after 1990, that conversion of the rest of the country to at least understanding a little about the tar sands.

AD: Now, who would you describe as some of the visionaries that you had contact with at that time?

BROWN: Well, I mean I've said -- Eric Newell to me was the person who had the most effective vision of what should happen and what could happen, and could drive that along through the Alberta Chamber of Resources, through his own corporate influence. I found some of the things that he was largely responsible for, and particularly the work of what became called the Tar Sands Task Force, changed -- the work that led up to that did two things, one I've already mentioned -- it brought people together and saying "We, what vision do we have? We cannot achieve it alone. We can only achieve it collectively." And, I think ... it produced a technical vision and it produced a financial vision and it produced a political vision that led -- that led to a lot of things. It led to the state of, in my view, to the state of the industry as it is now -- to its scale and, notwithstanding difficulties, to its acceptance, the acceptance of its importance.



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



I think the other person that I had a lot of admiration for preceded Eric Newell but was a person who set [up] AOSTRA, set AOSTRA on what I'd call a sound technical footing -- was Clem Bowman because his ... he never abandoned the idea that anything that was done scientifically should be rigorous, and he was insistent that things were proved over and over again, that doubts were explored and cast aside, or if not cast aside, clarified. And ... it was the style, his style of talking about research and in persuading -- really, he came out, he was an industrial engineer, but he was ... he was listened to very attentively by everybody who was doing research because his arguments, for reasons that I wish I understood, because I would've used it, people listened, scientists listened to his arguments. If -- the credibility was incredibly high, and maybe that's the word that the two people have in common, both Newell and Bowman have an immense level of credibility, not only within their own industries, not only within government because Clem in the end was -- AOSTRA is essentially a government, an artefact of government, but all kinds of other, other governments and other industries turned to them. And it's only to see, if you look at what they have done since they left the oil industry, you can see that credibility coming through in the things they do now.

Those were the two people that, as a researcher, research manager, I felt were the most influential in the oil sands business.

AD: Now, you know, that strategic decision that basically said that we need to have a centre that is going to concentrate on oil sands research and that it is going to bring together federal/provincial government, researchers and it's going to work collaboratively with industry on real problems, and that is going to pilot things, now, that also resulted in building up research capacity at both the University of Alberta and the University of Calgary. Do you want to talk about that...

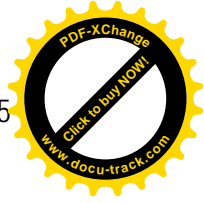
BROWN: Yes, it ...

AD: ... those relationships?

BROWN: ... I think it did. The relationship between the Alberta Research Council and the universities has always been very, very strong. I think it's an issue of proximity and people moving backwards and forwards. The ... but Alberta Research Council has never had -- one role it has never had that the federal government did have. The federal government is a major sponsor of, funder of research activities and the ability of the programs at Devon, even after they had become collaborative, the federal government still had the federal agency that was part of it, still had that ability. So it had the ability to fund research that was complementary, essential, an essential adjunct to the main research program, but could be -- but money could be moved directly from the centre, if you like, of this controlling -- that's not a very good word, but of this, this core out into the universities; and that brought in the universities. But I mean simultaneously, while this was going on, the universities were -- had -- other programs, centres of expertise programs which were created, which allowed them to access funds from the National Scientific and Engineering Research Council -- allowed them to say we are operating these research programs within the umbrella of this central industrial/government organization in Alberta.



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



And if you like, that each is lending the other an air of credibility because the university is the home of the ultimate pure-end of research, even though that may be applied research. The industry is the end of the application of that research. And ... the universities can make joining in this umbrella ... it increases everybody's, everybody's ability to argue, if you like, for funds; to argue the merit of their case; to stand up to the criticism of the academic or of the industrial; and, in standing up to the criticism, that's the way research progresses. The idea is only good until it's disproven and then the idea improves.

In addition to that, the industry themselves have always funded research and development to different extents, but now they too were looking at this from the point of view of this umbrella program. So it had tentacles that were stretching out from everybody who was responsible for putting money towards universities.

AD: Well, you had the era then of the creation of the research chairs, you know ...

BROWN: Yes.

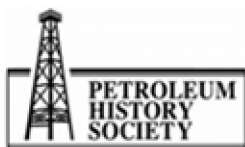
AD: ... Syncrude, the chair that Jacob Masliyah ...

BROWN: Yes.

AD: ... first held, and so on, so that we, because today you have the issue raised of whether government should be investing in this kind of research and you have some naysayer saying, "Oh well, it benefits the industry and therefore, you know, let the industry fund it." But it's much more complex, isn't it?

BROWN: It's not a simple, simple issue at all. And ... what used to be a federal government criteria -- is this in the public good -- it is not one that is very easy to answer. I think it's quite difficult to argue -- for instance, if we take the example of the tar sands, are you going to argue the establishment of the tar sands was in the public good, or are you going to argue that the problems that are created by the tailings, the problems that have not yet been resolved -- is that in the public good? It's certainly a double-edged sword, if not more than two. I guess, because I come out of the research side, it is -- the common argument would be that you can't tell where research is going to take you.

I think you can -- the classic example of that is the American space program which produces, I don't know, produces Velcro zip fasteners, because they want to put a man on the moon? But I use Velcro on everything, and so does 95 percent of the North American population. It's impossible to predict from the outset what is public good, what is industrial benefit? If a government is, as a matter of government policy, going to support research and development, then it behooves the government to make sure that that research and development does cover, first, the public good. But where it wants to use research and development to increase the capacity of the nation, which is also a public good, it behooves it to have the industries that are likely to take it to fruition as part of the process from very early on. And that's, I think is -- that's one of the strengths of all of the tar sands



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



research that is currently going on. It's helped by the fact that -- although Alberta is big, it's a concentration of research activity -- well, between Alberta and Saskatchewan. It's unfair not to mention Saskatchewan.

AD: So when did you then leave the federal government and Canmet?

BROWN: I retired from the federal government in 1995 and I worked for three years as an advisor to what the Alberta office -- it was actually called Office of Coal Research and Technology, AOCRT, which was the organization that had been created in Alberta to administer the old Alberta/Canada Energy Resource Research Fund. And I worked on a part time basis for them, mostly reviewing research proposals and working towards an end that saw the abandonment within Alberta of dedicated coal research and the amalgamation of all interests into an energy research program; much, much along the lines of the amalgamation that I described earlier ... with my own views about research. And that still continues at this moment that all of the energy issues are so interrelated and the technologies are so -- and tar sands is a mining operation; coal mining is a mining operation. These are -- the technologies are integrated and overlapped to a large extent.

And I worked with the Alberta government for three and a half years and at that point I had physical problems with my legs that really meant I had to stop, get some operations and that took -- it was a year and a half. And a year and a half is a long time to be away from research and development; and I had lost a lot of touch and decided really it was time not to be doing it anymore. I still continue doing one or two mostly research proposal review because one of the things you're supposed to learn as a research manager is something about research project management; and it's, ... trying to persuade researchers that deadlines and objectives and delivery on deadlines and delivery on objectives is important, sometimes can be difficult.

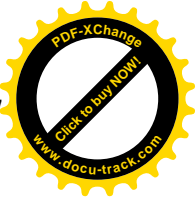
AD: Now, in terms of your coming out to Alberta, the setting up of Canmet and then the Oil Sands Task Force, all of those things that in terms of the last part of your career, you were a part of the significant strides made by the oil sand industry, but directly connected to innovation in research. Is that fair? I mean a fair summation?

BROWN: Yes, I think so. I think it may apply in other industries, but I think the way that research development is done nowadays by the institutions, by the Alberta government, by the federal government and by the universities has over the past 20 years made dramatic changes that, if you like, what was the "classical ivory tower" is much less, much, much less and less important. That is not considered to be the best way to do a lot of research. It has its role, but it is not the only way to do research and development, and if you're looking at a resource exploitation that is going to end up as a heavy engineering exercise, then it's well to be close to the people who are the practitioners of heavy engineering, and that really is what this umbrella of research is that I described.

AD: Now, all too frequently the term "world class" is bandied about, but I think that it could be applied to the research facility at Devon, what's happening in the oil sands area at the University of Alberta, and, you know, at the University of Calgary with its in-situ focus.



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



BROWN: Yeah.

AD: And, again, that would not have happened without a) the investment and b) the creation of these various research facilities, both within government and externally in academe and industry.

BROWN: I think that's true. I think that there is -- a factor that I have always through contributed to the establishment of the places as centres of excellence -- and perhaps they're something more than just a centre of excellence -- is the willingness of the industry to be involved. At one point, very late, not long before I retired, I conducted a project to examine the possibilities of converting the Devon Research Centre into a fully-commercial technology research centre; and, in the course of doing this, we talked to a lot of people. But one thing that one person said to me when I was in discussion saying about how much money would the industry put in to this, the idea being that it would be a multi-partied funding mechanism and he said that he would not say but he said, if you're the best in the world, we'll come and spend a lot of money with you.

And, really, all that says is, if you're good enough, don't worry. And I think that is what has -- that has happened in Alberta that the excellence of the people has brought in the money, which fosters the research, which helps the educational process, which brings through the next level of expertise, which perhaps imports the expertise. There's nothing -- there's nothing says it has to be grown here; it has to be used for the benefit of and preferable used here. But I think the willingness of the industry to support with its own money, with its own profit margin, is a very important factor in creating all of these centres of expertise.

I remember we talked earlier -- I've talked about hydrocarbon upgrading research at Bells Corners in Ottawa when hydrocarbon upgrading was not something that was going on very much. There's a person working there who -- called Pruden, Barry Pruden, who became a professor of chemical engineering in Calgary University. A circuitous route; it wasn't just a straight step there, but he was there because an oil company endowed chairs. And it's that willingness to support that level of expertise that encourages the others to try.

AD: Now, you use the term "import talent." Well, you know, you were an import and, you know, Hassan Hamza from ...

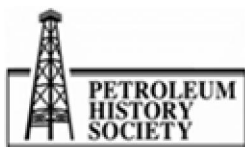
BROWN: Yes.

AD: ... from Egypt; Jacob Masliyah ...

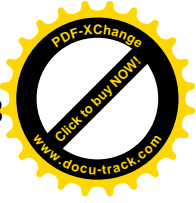
BROWN: Masliyah, yeah.

AD: ... from, you know, the Middle East, and then the UK and so on, so that the research establishment pertaining to the oil sands is very international, isn't it?

BROWN: Oh yes. I, my -- my first contact with a director of research was Syncrude, was with John Clark. Not, not Karl Clark, but John Clark.



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



AD: Yes.

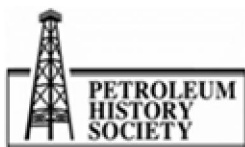
BROWN: Who was out of the oil industry but had been born and educated in India. He was -- probably was Scottish ancestry but then he -- and it's the nature of the oil industry that it is an international industry - maybe dominated by American companies but the people in Suncor are multinational and, I think, that's probably the picture of research in all kinds of areas nowadays.

AD: Now, I want to go back to a point that you made about the mandate of federal facilities, you know, that they are mandated to do activities that are in the public good. Now, I think that there has been a whole different interpretation of the public good post, say, 2000 that, before that, anything that the government did that resulted in stronger industry and, you know, increased GDP, jobs, I mean all of that was viewed to be in the public good. But, with the rise of environmental criticism targeted at the oil sands, then both the federal government and the provincial government are getting very different messages, and that when you add -- to what activities the government should fund, sponsor, whatever, relating to the public good, have changed. And also you've had no -- the notion of corporate social responsibility. Do you want to talk about this? I mean, you know, you clearly have remained very interested in the industry and I'm sure you're struggling with some of those notions.

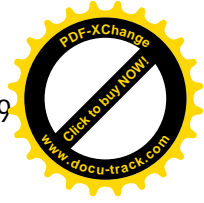
BROWN: Well, I have always believed that a research scientist, in my case in the government of Canada, but also within other governments, is just as much an instrument of government policy as a taxation role. And, if the government policy is such that for whatever pressures go on to the government to create [a policy] that environmental issues are paramount as opposed to energy self-sufficiency, it's huge. If that's government policy, it is -- for a government scientist -- it is cast in stone. Now that's not necessarily a very popular stance with a research scientist, but it's perhaps a relic of a Calvinist upbringing that, if you pay the piper, I can't help that, that's just the way I feel about it. Having said that, there's no question that the pressures on government to be more, to be vitally concerned with all of the environmental issues; it's around the tar sand and they do -- it's a legitimate avenue for government policy to foster research in that direction. It would be -- yeah, how far that balance should swing at any one time, because we can be equally certain that in 1973 we thought we weren't going to have enough oil. Now, do we ever hear a comment about that; certainly not in Canada, hardly in the United States.

A question that is answerable, that -- trying to be answered now is --are we going to be able to continue to export oil to the United States? Are they actually going to want it, and for how long? So the government policy inevitably is going to change. That makes it sometimes a little bit difficult to create long-term research programs, but I personally therefore don't have any great question about the switch in emphasis that has had to occur because of public pressure. I would like people to be better informed about the issues surrounding the tar sands because, as in all of these questions, it never is black and white.

It used to be the case, there were arguments about the environmental impact of the nickel smelt -- smelters at Sudbury and it did devastate the land. It devastated the land so much that American



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



astronauts trained there because it was -- it was like the moonscape. So there was devastation, but the counter balance is how many families had food put on their table? And those swings and roundabouts are very difficult to consider in all of this discussion. And, indeed, the issues are very complicated and -- so you maybe have to reduce them to simplistic levels. I think it's sad that you do because I take issue with a lot of things that are said, but...

AD: Now, you mentioned the Tailings Consortium and you've mentioned it as, as one of the three, I believe, research focuses at Canmet. What was being done with respect to tailings research from 1984 to, say, 1995 when you left?

BROWN: Well, in '90 -- it started off with determining what the constitution of the materials in the tailings was. And that was the first difficult hurdle and that was done but it revealed that it's not going to be a very easy problem to solve, because of the nature of the clays that were in the tailings. A number of additive procedures were developed that did make a big difference and have been successfully applied, and the tailings issues are still around but they're largely matters of scale, and that they are soluable, solvable (I don't know which is right). They're solvable issues with time and they're always going to be huge operations to do. I think that -- I think that those issues are largely resolved. Well, I haven't been part of it for ten years now. Maybe I'm sticking my neck out too far, but I think sufficient progress -- to be very, very hopeful that they are resolved -- has been made.

I think changes in the way the process is applied have been made; originally, the process, as all, was based on the original hot-water process. It's not hot water anymore. I think changes have been made where the separation process does not have to have its own plant to conduct the separation [and] that it can actually be done in transportation pipelines, which is an immense, an immense step forward in the handling of materials. So I think that particular environmental problem, that particular government responsibility, if you like, public interest is -- solutions are well advanced. I'm very careful never to say it's solved.

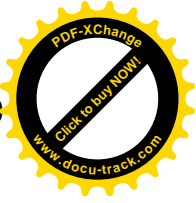
AD: So, you know, what your, what I think is, what underlies your belief is the notion that by improving processes and better and better science that you're going to resolve these issues, is that correct?

BROWN: Yes, you can't -- the solutions are likely to be all encompassing -- demand all-encompassing changes, not a change -- not an add-on process at the end. There may well be an add-on process at the end but, in order for it to be effective, there will be a need for upstream, upstream change to accommodate this later addition. And all that has to be done without increasing the cos, and it has to be done really without doing anything except improve the product stream that you're, that you're making. Those are not necessarily things that fall into line.

AD: Now, we've seen the federal government and the provincial governments invest heavily in research because they perceive that it was in the public good to do so. Now we've just had the university -- the provincial government, the Redford government -- making major cutbacks that are



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.



impacting on the university's capacity to retain the talent that it has, as well as recruit new talent. Do you want to comment on that at all?

BROWN: Well, I -- it's very difficult for me to comment on that. There is -- the Redford government changes are driven by the economics of the province and I do not believe that these are done, these changes, the proposed changes, proposed cuts, whatever field, they fall in are done without thought. And it may be that for, as an example, that cuts to the university are the lesser of two evils. But not knowing what the other evil is makes it very difficult to be certain that it is a right or a wrong decision. And mostly these decisions are gray anyway.

AD: So are there any summative remarks? Any stories that you'd like to tell me that direct questions haven't evoked?

BROWN: I think there's one thing I would say. From a perspective of a researcher who was an active research scientist, the things that I found out about industrial interest in research and industrial researchers in Alberta were eye-opening. In the sense that people wanted these things to be successful, they wanted the research to be successful, either because they perceived a need for it - - they perceived personal benefit from it. Who knows? But their drive, in conversations, was -- the hope that it ... would be successful. And that's not to put too fine -- that's inspirational in its way. And I'm grateful for the opportunity of having worked here.

AD: Any last words, or is that it?

BROWN: No, that's about it.

AD: Okay. Thank you very much for agreeing to be interviewed and, you know, for elucidating this important period in your personal life, but also in the development of the oil sands. Thanks so much.

[THE INTERVIEW CONCLUDES.]



Sponsors of The Oil Sands Oral History Project include the Alberta Historical Resources Foundation, Athabasca Oil Sands Corp., Canadian Natural Resources Limited, Canadian Oil Sands Limited, Connacher Oil and Gas Limited, Imperial Oil Limited, MEG Energy Corp., Nexen Inc., Suncor Energy and Syncrude Canada.