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The Canol Project - Ancestor to Leduc

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Following is the edited text of Dr. Stelck's Noon presentation on February 19, 1997.

My topic this afternoon is the Canol Project, the direct and genetic ancestor of the Leduc discovery. Last week I was invited to the great celebration of the discovery of Leduc after waiting for 50 years. I listened with bated breath to the politicians, the various Ministers and the management of Imperial Oil. They lauded the increase in population in Alberta; they lauded the roads built to service the oil fields. They loved the money they had to play with, but they forgot to thank that thin line of discovery that they downsized. Being sort of a geological relic myself, who cannot be exported without a permit, I felt it to be my duty to trace the discovery of Leduc before the money angle became dominant and tell of the men of that half century before the

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New Board of Directors Elected at Annual General Meeting on March 19th

President: Vern Millard
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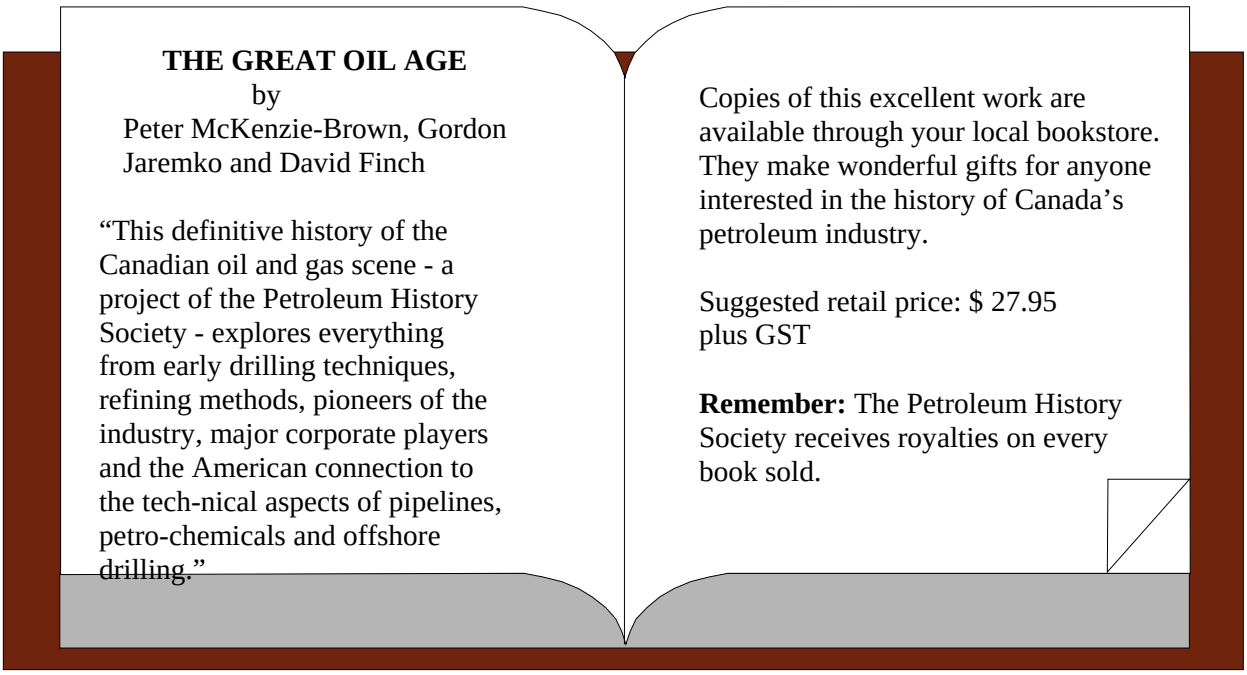
Jack Browning speaking on:

The Oil Business - Then, Not Now!"

Date: Thursday, May 1, 1997
Time: 12 Noon
Place: Palliser Hotel, Calgary
Cost: $20 for members, $22 for non-members

Please RSVP to **Bill McLellan, 286-2191** no later than Noon, Tueday, April 29th.

"We'll see you there!



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discovery of Leduc. Make no mistake, the Imperial exploration group was looking for a reef when they found it. And all because of the Canol Project.

The story starts over 100 years ago in 1887, when G. M. Dawson and R. G. McConnell started up the Skeena River, crossed over to the Dease River, and separated on the Liard River. Dawson went **up** the Liard and down the Yukon River to become the patronym of Dawson City, as he beat the gold rush by a decade. McConnell turned and went **down** the Liard, through Hell's Gate, down the Mackenzie River and, crossing the Richardson Mountins, went down the Porcupine River and up the Yukon River to exit at Lynn Canal.

McConnell's trip, which took two years**,** completely circled the Mackenzie Mountains and the fossils collected along the Mackenzie River finally found their way to J. F. Whiteaves, who recognized Triassic and Devonian fossils. F. B. Meek had already described fossils from the Arctic Devonian, but the entire edition of his work, except for half a dozen copies, had been destroyed in the Great Fire of Chicago in 1871. Whiteaves became the critical paleontologist for the Northwest Territories, although he stayed in the East.

A score of years ticked away. Although T. O. Bosworth and E. M. Kindle published sketch maps of the area below Fort Norman, it was young Ted Link for Imperial Oil that staked a well on a seepage at the mouth of Bosworth Creek, successfully bringing in the Norman Wells Field in 1920. The cable tool hole produced from fractured shale at a very shallow depth. The shallow wells were sufficient to support a small refinery that for many years supplied the lower Mackenzie with fuel. The Mackenzie River was the economic lifeline of the western Territories.

World War II and Pearl Harbour changed the

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scene. G. S. Hume, who had mapped in the Norman Wells area, was made energy czar. The concept of an unsinkable tanker to pursue the war with Japan brought about the Canol Project, which was to build an oil pipeline across the Mackenzie Mountains to supply the refinery at Whitehorse. The Norman Wells field was to be further developed.

With the need for a pipeline, a route had to be established. Guy Blanchett tried to follow a route around the north end of the Mackenzie Mountains, which was rejected. Adam Burwash, at the age of 60 years, put on a pack and snowshoes and actually walked over the Mackenzie Mountains in the middle of winter to establish the route that was ultimately chosen for the pipeline.

The U. S. Government brought in military personnel to build the pipeline. They established Camp Canol across the river from Norman Wells and started carving a service road out of the frozen landscape. Before the ice went out of the Mackenzie River that spring, new wells were drilled to the carbonate at Norman Wells.

Ted Link came back to ramrod the geological end of the Canol exploitation of the Norman Wells field. Both Link, and Hume who had been mapping for the Geological Survey of Canada in the early 1920's, assumed the trap they were dealing with was a roll-over or anticline. However, Desmond Boggs had been brought up from the South American operations of International Petroleum to do the geological housekeeping during development drilling. Boggs, looking at the cuttings of the limestone that lay under the fractured shale, quietly introduced the term “coral reef.”

The concept of Continental Drift was not in favour at the time, nor were coral reefs in the Arctic - Boggs was considered to be “out of his tree.” The protagonists battled and I was called in to “referee.” I entered in the deep of winter and asked, “Where’s the game?” I was handed a bunch of dogs and pointed into the Franklin Mountains.

From the ice on Fish Lake we could see Kee Scarp. When the snow melted some, we could see that Kee Sarp was reefoid and Des Boggs was declared the winner. The limestone from that reef was used to keep the airport runways in trim and the present quarry face clearly reveals the reefoid nature of the rocks.

When the ice went out on the Mackenzie River, barges moved in equipment and some 30 geologists swarmed in to make up the 10 exploratory trios that would map rivers from the Liard to the North Yukon. My party, with John Carr and Ivan Six was sent to Bear Rock opposite Fort Norman, but all we found was a gypsum section under the Devonian rocks.

By this time, the reef body was known to be associated with the Fort Creek Shales. As Charles Camsell had reported, such shales were apparently present in the canyon of the Peel River in northern Yukon. One of the exporation parties, John Carr, Elmer Umbach and me, was given the assignment. Late summer in the Yukon turned out to be the rainy season and the descent through the first canyon left us a little apprehensive. The river was rising such that when we stopped for lunch, the gravel bars we were on would disappear as we ate. As the river plunged into the second or lower canyon, the head

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rapids had disappeared and the water was like glass. The shales, which were Late Cambrian to Middle Silurian in age (not Devonian), were cut by a vertical competent member that produced a huge whirlpool in the river that sucked up floating "islands" of upright trees and they would disappear. Up the cliffs we went with our canoes, as Camsell's old markers indicated there was 70 more feet of water in the canyon than when he had been there. The whirlpool was clearly not navigable. When we got below the canyon, we sighed with relief but the incised meanders were so filled that the water did not turn with the curve, but ran into the canyon wall and spiralled under to round the curve. Only the backwash from the wall and furious paddling allowed us to say afloat.

With the Japanese finally losing the War, Canol exploration efforts were cancelled and most of the geologists ended up in Imperial Oil. Reefoid geology had come to Imperial Oil, but meant very little to Alberta where the whole play at that time was dominated by rocks of Mississippian age. Although the Devonian Jefferson Formation was exploited in the United States, it was considered no good in Canada.

One of my classmates at the University of Alberta, Doug Layer, after a summer with the Geological Survey of Canada, had a slight falling out with G. S. Hume and so, in the late Depression years, was working as a time keeper and checker on the Banff-Jasper Road construction. A job came open in the newly created Conservation Board. Dr. John A. Allen of the University of Alberta set out from Edmonton to find Layer, walking the last miles into the construction camp - rescuing this Depression unfortunate back into a life of geology.

Layer finally went to Imperial Oil, where he had the chore of looking at the Bruderheim Well and with an astuteness beyond the call of duty, recognized reefal material in the cuttings. Imperial listened to the reefoid whisper. Both Link and J. B. Webb had an open door policy and anyone could come in and get through to the head geologist. So Layer was assured of an immediate hearing. They decided there and then to look for the hypothetical reef, but the only good seismically reflective horizon was the Viking Formation. They sent their seismic crews southwest in the direction suggested by the senior members of the geological staff. Had they gone east, they might have found the Willingdon Reef which was later found to be full of water, not oil. If they had gone to the east, Shell Oil, who was pulling out because there was "no oil in Alberta," would have been vindicated. However, Imperial explored to the southwest and on the way stumbled across the Joarcam oil field, a good Viking sand discovery itself. A good omen.

In Saskatchewan about this time, there was much anti-big business feeling, and Saskatchewan kicked the oil companies out for daring to exploit their resources.

The Alberta group was suddenly endowed with extra funds that had been assigned to exploration in Saskatchewan. With our new-found wealth, we could go ahead and drill some more wells that year and in 1947 Leduc #1 was brought in with monies coded "S" for Saskatchewan, although some said it was for J. C. Sproule who ran the area.

The well had been spotted on a seismic high in the Viking Formation and is today well within the Leduc Field. However, when it hit
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the Wabamun Formation (or the Jefferson as we thought then), it was as disappointing as it had been elsewhere in southern Alberta. When we surprisingly encountered the Calmar Red Beds, it looked like "curtains" for the well. Steve Cosburn was sitting the well and relayed the red-bed information to Webb, who sat on it for a while before relaying the information to Link in Toronto, who went golfing. When Link finally relayed the information to the New York office,. "Shut 'er down!" was the order. Everyone "knew" red-beds were Silurian in age, because that is the way it was in Michigan.

Link paused another few hours before relaying the shut-down back to Webb. The extra few days gained resulted in the discovery of oil in the Nisku Formation - not the Leduc reef. A second well was located and refinement of the location was critical. The Viking crested over the east flank of the Leduc reef, but compaction of the shales did not reverse the dip on the Viking until just east of the reef. This was unknown at the time, but fate intervened. There was a slough on the originally selected location, so the engineers moved the location to the west side of the slough and the great Alberta reefal discovery was made - Leduc #2. Aubrey Kerr became the first person to handle samples of the reef. The original location in the slough would have missed it.

WE NEED YOUR HELP

We would like to get "the word out" about our Society to all retirees of the petroleum industry. If you know of any retiree newsletters that might be interested in passing information about us along to their retirees, please call
Pete Savage at 249-3525

The race was on. Before other companies could get their thinking caps on, Imperial raced to the Redwater reef - original source of Doug Layer's Bruderheim cuttings. Eric Harvey was sitting on a lot of Redwater leases with a millionaire Glenbow smile.

I had gone off to Stanford as the oil industry seemed quiet, returning to find myself a referee again. The question was: Is this a Devonian or Silurian reef? The "great guru" spoke: "yon fossils indicate that the reef is of Lower Minnewanka age, somewhat low in the Blackface Mountain Shale, about the horizon of the Fiddle" - meaning Upper Devonian. So Imperial's management went out in astonishment and named the town on the banks of the Saskatchewan, Devon.

The three discoverers of the Leduc Reef, then, were Des Boggs, Doug Layer, and the unknown engineer who moved the well location west of the slough.

Do you have any "fond" memories or anecdotes about your life in Canada's petroleum industry you would like to share? Why not write a brief article or even a note on the subject for our new column in the PHS *Archives*. Mail ***your*** stories to Bill McLellan, 24 Varslea Place N.W., Calgary, AB T3A 0C9 or send them in by fax: (403) 244-2018.