

**PETROLEUM
HISTORY
SOCIETY**

ARCHIVES

Newsletter of the Petroleum History Society

October 2011; Volume XXII, Number 6

P.H.S. Lunch and Learn Meeting – Wednesday, October 19, 2011

**History of North American Unconventional Oil:
from Craigeith to Fort McMurray to Colorado**

by Frank Dabbs - Historian and Author

Frank will describe the link between the Craigeith, Ontario oil shale project (1859 to 1862), the development of the Alberta oil sands, and the future of the American oil shale deposits in Colorado, Wyoming and Utah.

Frank has been a journalist, author and editor in Alberta and, more recently, in Ontario since 1967. Currently he is a regular columnist for Sun Media in Ontario daily newspapers and a contributor to the United Church Observer and Meaford Independent. His journalism credits include columns and features for The Financial Post, Oilweek, The Calgary Herald, The Calgary Sun, Alberta Views, Alberta Report and Alberta Venture. He has been an editor with Oilweek and The Calgary Sun. His books include: Ralph Klein: a Maverick Life (1995); Preston Manning: Roots of Reform (1997); and Branded by the Wind: The Life and Times of Bill Herron (2000). Most recently he edited Life of Discovery by Arne Nielsen, to be published by University of Alberta Press in 2012. Frank holds a Petroleum History Society Lifetime Achievement award for journalism and books on oil and gas history, and the Petroleum History Society Book of the Year Award for 2000 for Branded by the Wind.

TIME: 12 noon, Wednesday, October 19, 2011.

PLACE: Calgary Petroleum Club, 319 – 5th Avenue S.W. – Viking Room

COST: Members \$30.00 and Guests \$35.00 (most welcome) (cash or cheque only)

**R.S.V.P. if you wish to attend to: Clint Tippett, 403-691-4274 or
clinton.tippett@shell.com by noon, Monday, October 17, 2011, if not sooner.**

**Individuals who indicate that they will be attending
- but do not materialize - will be considered**

“no shows” and will be invoiced for the cost of the luncheon.

Individuals who do not R.S.V.P. by the deadline cannot be assured of seating.

THE PETROLEUM HISTORY SOCIETY THE BULL WHEEL



Next Luncheons: Following the October 19 luncheon, our next event is scheduled for November 30 and will feature P.H.S. member Kelly Ogle speaking on “Canada, The United States and Energy Security”. Kelly was last year’s winner of the P.H.S. Scholarship at the University of Calgary and his talk relates to his recent research there. For subsequent luncheons we are always seeking speakers and interesting subjects. If you are considering making a presentation, please contact Clint Tippett, President P.H.S., at 403-691-4274.

Arne Nielsen Biography: Director Doug Cass has alerted us to the announcement by the University of Alberta of the plans for a 2012 release of P.H.S. member Arne Nielsen’s biography, edited, as indicated in this month’s luncheon announcement, by Frank Dabbs. The book is indicated to be titled or subtitled: *We Gambled Everything – The Life and Times of an Oilman* and is described as: *“We gambled everything - our careers, our fortunes, the future of our nation - and every day brought new discoveries. It was like living on a frontier.” - Arne Nielsen. The memoir of Canadian petroleum industry leader Arne Nielsen is not a conventional business biography. During his six decades in the business, he witnessed critical events in the oil industry that influenced Canada’s economic history. From rain-soaked tents on the Arctic barren land to the luxurious New York offices of a multinational oil company, Arne Nielsen’s expansive knowledge of geology and the oil industry made him one of the most influential and well-known figures of his time. His memoir provides crucial details and unique perspectives on events that will be of interest to the next generation of oil industry executives as well as to consumers, economists, and ecologists.”* We are certainly looking forward to its publication. It is particularly timely given Arne’s role in the 1950’s discovery of the Pembina Cardium Pool and the recent resurgence of interest in these mature hydrocarbon accumulations that were long thought to be “over the hill” until new drilling and completion techniques were brought to bear.

Historical Alberta: It is refreshing to see that there is quite a bit to see and do in Alberta if one is interested in history. A sampling can be gained by visiting one of the tourist visitor centres such as those in Canmore, Alberta and Field, B.C. which are well stocked with brochures advertising places to go and things to see. Among those that have a petroleum connection are The Canadian Petroleum Discovery Centre (now renamed the Leduc #1 Energy Discovery Centre) in Devon and The Oil Sands Discovery Centre in Fort McMurray. Of course the Cowboy Trail threads its way along Highway 22 through Turner Valley (still waiting in its own interpretive centre). Many other small- to medium-sized local museums exist across the West and likely have a component of petroleum history on their shelves. One recent addition seems to be the “Boomtown Trail” in the Highway 21 and 56 “corridor” whose towns are said to be known for a “boomtown” style of architecture from the beginnings of the 20th century.

Pipeline Mania: It is probably fair to say that not since the 1950's has the petroleum industry's attention been so focused on pipelines and related entrances into markets. In those days it was the Interprovincial Pipeline gaining access to eastern Canadian and Midwestern American markets for the flood of conventional crude oil from Leduc and Leduc-related fields; the TransMountain Pipeline giving this same crude oil access to the West Coast; and the Trans-Canada Pipeline supplying natural gas to central and eastern North American markets. Now a new prolific supply of unconventional heavy oil and bitumen from the oil sands is seeking sales outlets as far away as the Gulf Coast via the controversial TransCanada Keystone XL line. Thirsty customers in the Far East are encouraging the construction of both gas and oil lines through northern Alberta and British Columbia including the Enbridge Northern Gateway to Prince Rupert and the as-yet un-named natural gas line to planned LNG export facilities in Kitimat. At the same time, new local unconventional sources of natural gas such as the Marcellus are undercutting Canada's traditional export markets in the northeastern U.S. and are causing tolling-related grief for shippers on Canada's major east-west lines as shipped volumes fall. In the background is the long-held belief that Canada ought to diversify its export markets and trading partners. And let's not forget the languishing Mackenzie Gas Project from the Mackenzie Delta. It seems fated to return to hibernation along with the Alaska North Slope line due to low gas prices. In this regard it was interesting to see an article by Diane Francis in the Financial Post in Dec. 2010 calling on the Federal Government to "See Pipeline as Nation Building". It is a great notion to visualize the economic and political impacts for Canada of the M.G.P. in the same light as the construction of the Canadian Pacific Railway in the late 1800's. We live in interesting times! On a closing note, those of you who may be curious about the recent history of TransCanada, following its merger with Nova, can access a great volume called "We are here – The TransCanada Journey 1998-2010" that can be downloaded from their website at <http://www.transcanada.com/ebook.html>

Japanese Industrial Tourism: An article written by Daisuke Wakabayashi in the January 24, 2011 issue of the Wall Street Journal was entitled "Japan's Belching Smokestacks Draw Industrial-Strength Sightseers". Apparently the newest trend in Japanese tourism is "Kojo Moe" which means "Factory Infatuation" and describes tourists who caravan to Japan's industrial centres to take photos of power plants, refineries and steel mills. [News item from "Publications of Interest" from the Society for Industrial Archeology Newsletter, Vol. 40, No. 2 (2011)]. Perhaps this trend may help to get a Turner Valley Interpretive Centre going? As a note, growing up in Winnipeg, tours of local factories were available for school and other groups (like Scouts and Guides) and were very useful in allowing youth to see and appreciate manufacturing activities that are at the heart of our modern society. The highlight of one camping trip was a visit to a creosote plant making railway ties in Thunder Bay.

Dallas: A Dallas movie collection was released in the Spring. Many of you will recall the TV series that was an addictive prime-time soap opera about an oil- and ranch-rich Texas family. The DVD set includes a 1996 movie that tied up a few loose ends, two other related movies and a 2004 cast reunion special with scenes from the series' top 10 cliffhanger moments. Christmas?

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Back issues are archived on our website at www.petroleumhistory.ca

Contacts: info@petroleumhistory.ca

President: Clint Tippett – clinton.tippett@shell.com 403-691-4274

Secretary: Helen Turgeon – heldon@telus.net 403-239-4863

PASSINGS

A number of individuals associated with the P.H.S. and with the petroleum industry have passed away over the last while and we are a bit behind in bringing them to your attention.

Peter Bediz: January 24, 1914 - December 4, 2010. Peter was a noted geophysicist and one of the pioneers of the geophysical industry in Canada. He was born in Istanbul, Turkey. His area of expertise and qualified background made him the pre-eminent expert of re-analysis of geophysical and geological data for an integrated approach to exploration. He held two degrees from the Colorado School of Mines: Geological Engineering and a Masters in Geophysical Engineering. In addition he was awarded a teaching fellowship and M.I.T. while pursuing a Doctorate in Economic Geology. His professional career began in 1941 as a party chief on a seismic crew. Later, working abroad, he served firms in Turkey as a district geophysicist and was also involved in the same capacity with the Marshall Plan. Between 1950 and 1971 he held various positions with Century Geophysical Corp., both in Canada as President and later as the C.E.O. of the parent company in Tulsa, Okla. Since 1971, when he formed Bediz Exploration Consultants he was actively involved in domestic and international projects of considerable note in Canada, United States, Denmark, Greenland, the North Sea, Mediterranean countries and the Far East from 1977 to 1989. Peter was a Lifetime Member of the P.H.S.

George Fong: March 1, 1926 - August 20, 2011. George passed away at the age of 85 years. George was born in Arcola, Saskatchewan and was raised in Red Deer, Alberta. He attended the University of Alberta from whom he received his degree in Geology. George worked for Home Oil, Seibens Oil and Gas and Dome Petroleum. During his distinguished career George was credited with contributions to major 1960's discoveries in the Devonian Swan Hills trends and received from the Canadian Society of Petroleum Geologists both the Link Award (1959) and the Stanley Slipper Gold Medal (1995). George was a member of the P.H.S.

Harley Hotchkiss: Harley passed away on June 22, 2011 at the age of 83. His lifelong accomplishments are well-documented in his 2009 book "Hat Trick – A Life in the Hockey Rink, Oil Patch and Community" that was given the P.H.S. Book of the Year Award for that year. Harley was an honorary member of the P.H.S.

Harold (Hank) Williams: Hank was a very well known geologist from Newfoundland whose work on the understanding of the Appalachian Mountains drew much acclaim. He passed away on September 28, 2010. Anyone who met him came away with a strong impression of his love of geology, of music and of life. With the revival of interest in the geology and petroleum potential of many of the onshore basins of the East Coast, Hank's work has been given new importance.

Brant Bennion: Brant passed away on September 6, 2011 at the age of 51. Brant was a Chemical Engineer from the University of Calgary who joined and ultimately headed his family's business – Hycal Energy – which is one of the key companies in Western Canada for petroleum-related analytical services.

Matthew Simmons: Matt Simmons passed away in August 2010 at the age of 67. He is best known for his 2005 book "Twilight in the Desert" in which he argued that Saudi Arabia's oil reserves were nearing the highest level of production that they were capable of achieving, after which point the world's oil supplies would begin to decline. He also predicted that the Macondo blowout would bankrupt BP. He had a heart attack in a hot tub.

AOSTRA: HOW A GOVERNMENT-INDUSTRY PARTNERSHIP BRIDGED THE TECHNOLOGY "VALLEY OF DEATH" AND HELPED TRUMP VENEZUELA'S NATURAL BITUMEN ADVANTAGES

by Robert Bott, Director, Petroleum History Society

"We should give Hugo Chávez the Order of Canada."

Maurice Dusseault, professor of geological engineering at the University of Waterloo and an international authority on oilsands and heavy oil, made that intriguing suggestion during our recent interview for the Petroleum History Society's Oil Sands Oral History Project.

"If it wasn't for Hugo Chavez and the instability in Venezuela, that is where the oil would be produced," Dusseault said. "The reserves are huge."

Dusseault noted that Venezuela's in-place bitumen and heavy oil resources are almost as large - or larger than - Alberta's and are much more producible. Viscosity is lower and the reservoirs are thicker, warmer and more permeable - it takes a lot less steam to get a barrel out of the ground. Moreover, Venezuelans do not have to cope with subzero winters and their fields are much closer to tidewater tanker ports. Yet, Alberta has surged ahead in investment and production.

Political stability and investment certainty are only part of the reason Alberta has competed successfully, Dusseault said. "[The] second thing is the investment in research and in the development of highly qualified people. The Alberta government, back in the late '60s and early '70s, realized that conventional oil had peaked - our peak in Canada was 1972-73 - and that the only way, realistically, to sustain oil production was to foster the development from the oilsands, so they started spending a lot of money. A billion dollars from the government, a billion dollars from industry was spent over a 25-year period on pilot projects [and on] university research, training a cadre of highly educated people who now form the technical basis in the world for the heavy oil industry."

The pivotal event was the decision by Premier Peter Lougheed in 1974 to establish the Alberta Oil Sands Technology and Research Authority (AOSTRA).

"Before the advent of AOSTRA, there was little doubt that the heavy oil research and commercialization industry was centred in California" Dusseault said. "But over a 10-year period, that centre of activity moved to Alberta and since then, for the last 30 years, there's no doubt Alberta has been the centre of the heavy oil industry worldwide. I spend a lot of my time teaching these ideas and concepts that we've developed here in the field and in practice to other countries, like Argentina, Columbia, Kazakhstan [and] Egypt."

Dusseault himself was one of the first AOSTRA-funded scholars after he received his doctorate from the University of Alberta in 1977.

He said the government-industry partnerships engendered by AOSTRA and its successors (currently Alberta Innovates) provided a vital bridge across the "valley of death" that separates

the R and the D in research and development. Research is low cost and can tolerate a lot of risk, while development is high-cost and very intolerant of risk.

"There is a great big problem in bridging the gap," he said. "Companies don't handle this jump from the lab and bench scale to the pre-commercial - that's very difficult."

Clement Bowman, AOSTRA's first chair, who at various times directed research for both Syncrude Canada Ltd. and Imperial Oil Limited, was also interviewed for the Oral History Project. Like Dusseault, he cited AOSTRA's critical role in fostering research and testing techniques and technologies at the pre-commercial scale.

Bowman also noted the irony that AOSTRA's greatest success, the underground test facility (UTF) that demonstrated the effectiveness of steam assisted gravity drainage (SAGD), was the one major project that AOSTRA initially funded on its own without an industry partner. Yet another irony is that SAGD was originally conceived by Roger Butler when he worked for Imperial Oil, the one major oilsands company that did not participate in AOSTRA. Imperial had already decided on a different technology, cyclic steam stimulation (CSS), for its Cold Lake in situ project. Bowman said Butler developed the concept of SAGD in the early 1970s and brought the idea with him when he moved to AOSTRA in 1979, and subsequently to the University of Calgary. The opportunity for a field test arose when a mining engineer, Gerry Stephenson, proposed sinking a shaft into the oilsands and then from it drilling horizontal wells. This led to the UTF, which opened in 1984 and eventually demonstrated unprecedented recovery rates of 80 per cent or higher, with high efficiency levels in terms of the steam to oil ratio.

Butler, who passed away in 2005, saw his idea become the most widely used in situ recovery method-unlocking the vast majority of the bitumen too deep for mining, yet too shallow for higher-pressure methods such as CSS. Dusseault called SAGD "the star performer" of all the in situ technologies to date, although he anticipates that in the future it will often be used in combination with other methods, including CSS.

According to the Canadian Association of Petroleum Producers, a cumulative total of \$137 billion has been invested in Alberta's oilsands (as-spent dollars, to the end of 2010). That is quite a payback for a government investment of about \$1 billion - perhaps a little more if one goes back to the early work of the Alberta Research Council and the federal government.

(Note: The figure of \$1 billion each for public and private oilsands R&D investment is widely cited by government and industry. However, Eddy Isaacs, the chief executive officer of Alberta Innovates - Energy & Environment Solutions, gave a somewhat different and more precise breakdown of AOSTRA-era spending during his oral history interview: \$780 million by the Alberta government and about \$1.5 billion by industry. Various definitions and time periods for the respective investments would undoubtedly give a number of results, but the order of magnitude is about the same.)

Meanwhile, development of Venezuela's bitumen and heavy oil has lagged, especially since Chávez took power in 1999. This has occurred even though Venezuela's recoverable reserves are estimated at about 210 billion barrels, compared to Alberta's 170 billion barrels based on current technology and economics, according to *The Oil and Gas Journal*. For example, Venezuela's four upgraders are believed to be operating well below their total design capacity of about 600,000 barrels per day, while Canada's actual upgrading in 2010 was already more than 800,000 barrels per day and capacity is being added in bits and pieces.

By investing in research and development, and by creating a favourable investment climate (even if the actual environmental climate is harsh), Alberta and Canada have gained a huge head start over the largest potential rival in the race to provide an alternative source of petroleum, as conventional oil becomes increasingly scarce. If and when Venezuela does begin to catch up, it is likely much of the technology and know-how will come from here.

This article is the third in a series based on information from the Petroleum History Society's Oil Sands Oral History Project, which is recording the stories of oilsands pioneers in their own words. As with its previous oral history projects, transcripts and recordings from the project will reside in Calgary's Glenbow Archives. Robert Bott, author of Our Petroleum Challenge and other publications, is one of the oral history researchers.



Emile Shot and son Roderick leaving Fort McMurray for Fort Mackay by dog sled in 1922



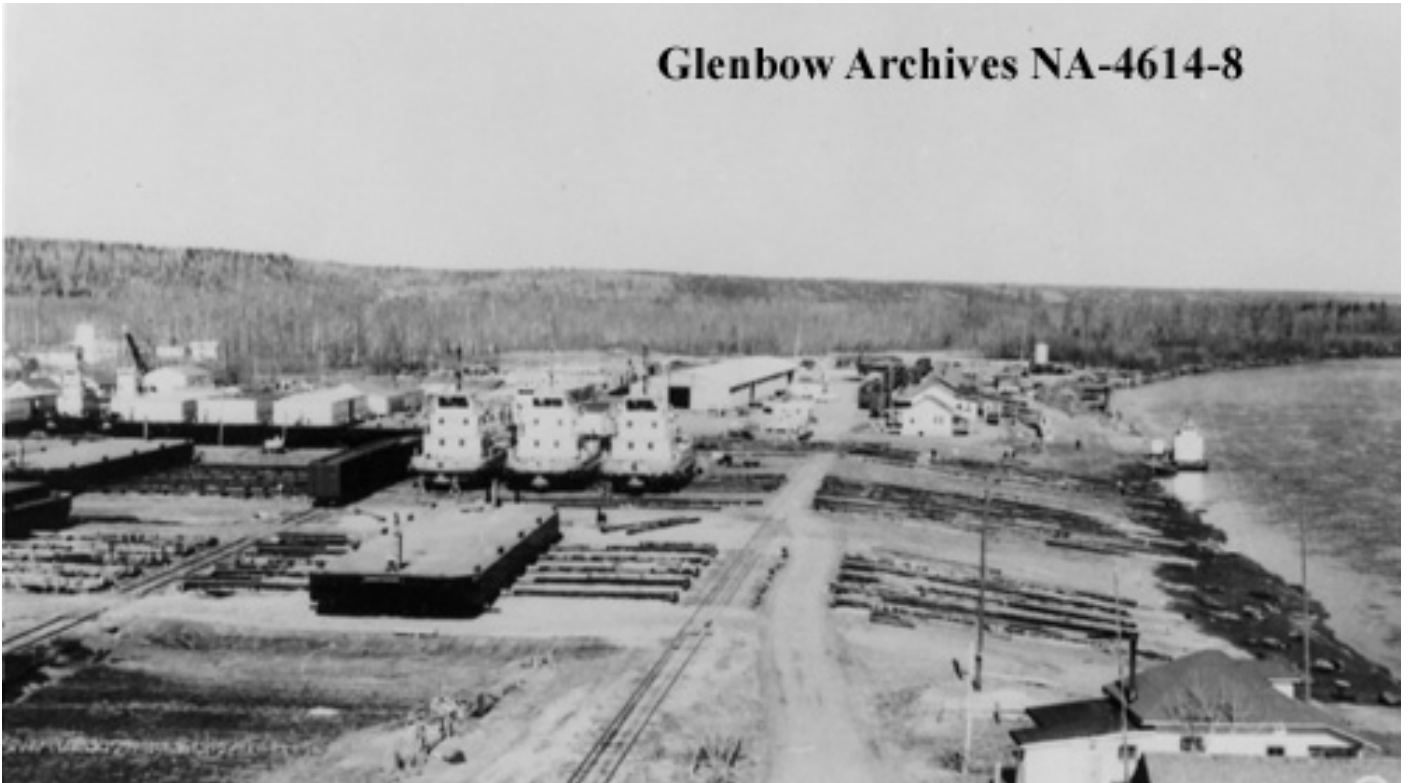
Royal Bank of Canada, Fort McMurray, Alberta, June 1926

Glenbow Archives NA-4614-9



Sternwheeler and Shipyard, Fort McMurray, Alberta, 1929

Glenbow Archives NA-4614-8



Northern Transportation Company Limited shipyards, Fort McMurray, Alberta, ca. 1920-1949. Note the three boats that have been dragged up and out of the water at the end of the navigation season and prior to freeze-up of the river.