



if you missed the...

REFLECTIONS OF
PETROLEUM DISCOVERY &
DEVELOPMENT ON
CANADA'S EAST COAST

AGM presentation

Wednesday, March 31, 1999 with
Don Axford - distinguished and pioneer
Canadian offshore geologist, consultant

.....share Don's perseverance and
continuity of purpose in our condensed
version for this issue of Archives.

In This Issue ...

Next Luncheon Details	1
Calendar of Events/Daily Tips	2
Tribute to Vern Millard	3
Don Axford's AGM Presentation	4
Canadian Oilpatch - 50 Years Ago	5
50 Significant Wells of W. Canada	6

**Next Luncheon - Fall 1999; enjoy the
summer and prepare for 2000!**

NEXT LUNCHEON

featuring

Jim Gray, Chairman,
Canadian Hunter Exploration Ltd.
and

Barb Zach, Executive Director,
Canadian Organizing Committee

TOPIC

Challenges to Presenting the 16th World
Petroleum Congress, Calgary, June 2000

James (Jim) Gray is co-founder of Canadian Hunter and 43 year veteran geologist of the Canadian oilpatch. His many awards and recognition of achievement include Honorary Doctor of Laws degree in 1991 (U of C) and Officer of the Order of Canada in 1995. In his current capacity as Chairman, 16th World Petroleum Congress, Jim prepares Calgary to host the global energy industry.

Date: Wednesday, May 19, 1999

Time: 12 noon (receipts at the door)

Place: Palliser Hotel - Colonial Room

Cost: \$20 for members, \$22 for guests

****Member attendance supports your Society.**
Posting this Notice for associates to join us for
an entertaining Lunch & Learn benefits all!

RSVP to **Bill McLellan, 286-2191** by Noon,
Monday, May 17. See you there!

THE PETROLEUM HISTORY SOCIETY
Calendar of Events and Daily Tips

Next Director's Meeting: June 9, 1999.

Society Web Site: Volunteer your expertise for the design and installation of a PHS web site in exchange for promotional exposure of your product and/or services. Please contact Dag Nilsen at 280-1026. It would be most advantageous to be up and running before 1999 ends in order to prepare for the 2000 World Petroleum Congress.

Society Library: PHS is exploring a joint venture with the Glenbow Museum and Archives to store and display our collection. Would all Members undertake a search to determine if they have any books or videos out, as there are several unaccounted for, or if they have additional items to donate. In either case, contact Bill McLellan at 286-2191.

Significant Wells of Western Canada: John Frey at 264-3693(B)/287-7930(H) and Peter McKenzie-Brown at 225-1012(B)/271-4608(H) wish to thank all those who have provided information and suggestions. The original list of 50, which has now grown to 72 (see Page 6), will serve as the framework for their jointly proposed book. Any input regarding additional data, plus possible deletions and /or corrections, will be most welcomed and appreciated.

Projects in Progress: CSPG Calendar input; PHS Brochure Redesign; Oral History archives; Millennium events and participation; Canadian Petroleum Hall of Fame nominations; Leduc/Edmonton field trip; Membership drive to reach 200 members by 2000; World Petroleum Congress/World Petroleum Show booth. If you can come forward and volunteer to serve on committees responsible for these projects, PHS will be grateful. Contact Clint Tippett at 691-4274.

1999 Field Trip: Repeat of August '98 Turner Valley tour planned by CSPG June 19, '99 & co-sponsored by PHS. Guides - Aubrey Kerr, Clint Tippett and Clark Siferd. Contact Clint Tippett at 691-4274 (Shell) for more information.

Year 2000 Goal: Public and industry awareness of PHS objectives and contributions through media recognition of events. Archives Newsletter regularly provided to Rick Charland, DOB; Ian Doig, Doig's Digest; Gordon Jaremko, Oilweek; Mike Byfield, Alberta Report, and Scott Jeffrey, Roughneck Magazine; also to oilpatch organizations AEUB, CAPL, CAPP, CSEG, CSPG, NEB, and PSAC. Luncheons advertised free of charge in DOB and Calgary Herald Community Bulletin Board articles.

1999 Membership Fees: Now due. Revised 1999 calendar year fees: Individual \$20.00, Sustaining Individual \$50.00, Institutional/Corporate \$100.00, and Life Time Senior (+65) \$100.00. **NEW** address - see Registration Form page 6.

Tip For The Day: (from *The 365 Stupidest Things Ever Said* by Ross & Kathryn Petras) "Outside of the killings, Washington has one of the lowest crime rates in the country" Marion Berry, mayor of Washington, D.C. "I don't make predictions. I never have and I never will." Tony Blair, British prime minister.



MILLARD — Vernon, September 30, 1924 - March 23, 1999. Beloved husband and best friend of Kay, passed away peacefully after a brief illness. Vern is lovingly remembered by his close family: his sister Betty; Margot and daughters, Naomi and Camille; Matt, his wife Deb, and sons, Liam and Myles; Ralph, his wife Jeri, and children, Jared and Tarry; Nick, his wife Lynn, and children, Rachael, Ethan, and Gabriel; Laura, her husband Frederick, and daughters, Selene and Rhianon; and his son Thomas. Born in Calgary, he served in Italy with the Princess Patricia Canadian Light Infantry and received an Honors B. Comm. from the U. of A. He interrupted graduate work in economics at the University of Chicago Conservation Board in 1950. Vern worked with great commitment at the ERCB, serving as chairman for the last nine years. Following his retirement in 1987, his consulting work led to his appointment as chairman of the directors of the WCB. Most recently he devoted time to the Petroleum Historical Society and the Lion's Eye Bank. Vern greatly enjoyed his ever-changing garden, and was always eager to explore new travel destinations. He gave Vern's integrity, his great sense of humour and his warmth towards others. A Memorial Service will be held at McINNIS & HOLLOWAY'S "Park Memorial Chapel" 5008 Elbow Drive S.W.I. on Friday, March 26, 1999 at 3:00 p.m. If friends so desire, memorial tributes may be made to the Lion's Eye Bank or to a charity of your choice. In living memory of Vern Millard, a tree will be planted at Fish Creek Provincial Park by McINNIS & HOLLOWAY FUNERAL HOMES "Park Memorial Chapel", 5008 ELBOW DRIVE S.W., CALGARY. Telephone: 403-243-8200

PETROLEUM HISTORY SOCIETY

**VERN MILLARD,
PRESIDENT**

1997 - 1999

**So long, Mr. Chairman,
it was an honour to serve.**

REFLECTIONS OF PETROLEUM DISCOVERY & DEVELOPMENT ON CANADA'S EAST COAST

PRESENTED BY DISTINGUISHED GEOLOGIST DON W. AXFORD TO THE PETROLEUM HISTORY SOCIETY
ANNUAL GENERAL MEETING - 31 MARCH 1999
(by Neil Leeson, Director, PHS)

Question. How do you adequately illustrate a 50-year history of petroleum discovery and development on Canada's East Coast in less than 45 minutes, as was our Speaker's challenge, or in this one page, as is mine? Answer. You don't. Instead the true secrets of our topic are uncovered by characterizing the faith and perseverance of our Speaker; one Canadian who stands tall among others over a remarkable five decade search to unlock nature's treasures in the waters off Canada's eastern provinces. Don Axford's recollections of his role in maintaining an ongoing investment enthusiasm in the two major players, Mobil and Petro-Canada, exemplifies the values by which Canada is now recognized in the global energy market. Currently no less than nine development and exploratory offshore wells are in progress. Hibernia's production envelope has tested 150,000 barrels per day. Would you believe credit for these undertakings could be traced back to great food and hospitality?

"As a Winnipeg native, the perils and apprehensions of Corvette duty off Canada's East Coast and North Atlantic during WWII bonded me to the regional suspense and cultures of the Atlantic Provinces. After the terror and hardships of lengthy sea duty, the memories of genuine hospitality and scrumptious home cooked meals awaiting the crews, in places like Glace Bay and St. John's, have never faded. In the beginning it may have seemed like a chance encounter. My fondness for this region of Canada, however, drew me like a magnet as I gradually established my oilpatch skills and reputation. As if I had planned it, my employment with Mobil Oil shortly after the war was an ideal sounding platform for my theories and strategies of East Coast energy potential. After all, Mobil drilled a wildcat 14,000 foot well six miles off Charlottetown's harbor in 1942 that held the British Empire's deepest well record for decades.

I got off to a slow start in formulating an exploration plan, mostly due to frequent interruptions, including assignment to Mobil's New York City Headquarters. Upon returning in 1959 I attended a personnel-evaluation seminar where a wall map of Canada highlighted Sable Island. I decided then and there that my focus would be petroleum exploration off Atlantic Canada.

The presence of Sable Island, an inexpensive and convenient drilling platform, intrigued and motivated me. I set out to learn everything I could about the offshore geology. I discovered area fishermen had recovered Jurassic rocks in their nets from time to time. Maps prepared by various governments, particularly those of the Nova Scotia Research Foundation, and Shell's Bill Gussow, were useful but only covered the onshore. Seismic Lines recently shot by Wood's Hole Laboratories of Massachusetts confirmed thick sediments could be present offshore. As Sable Island was at the intersection of three conflicting ocean currents, it became my focus. Putting my reputation on the line, I recommended Mobil lease one million offshore acres before any other firm had shown interest. Mobil President Art Detmar considered my suggestion "one of the dumbest things ever heard". Fortunately for Mobil and Atlantic Canada, Art changed his mind.

Art's instructions were to secure and maintain, in my name, both Federal and Provincial Permits. Although it was unclear, at the time, which government actually had ownership and control, it was still a dumb idea. Not until 20 years later did a Mobil lawyer from New York approach me for recovery of those Permits.

Action heated up early in 1962 as Shell acquired 20,000,000 acres surrounding Mobil's holdings. A landmark year was 1967 when Mobil, under the presidency of Arnie Nielsen, drilled Sable #1, the first well drilled distant from the continental North American mainland. We used a Peter Bawden Drilling land rig, shipped to Sable in a WWII landing barge. After ramming up onto the sandy, ship wrecked shore, a bulldozer pushed the rig off. At that time Sable had only six inhabitants to operate a weather station and lighthouse. The horses loved us - the rig presented the only scratching posts on the Island. After six months, 15106 feet and \$2,000,000, the well had encountered numerous oil shows in the Cretaceous from 6400-7000 feet and bottomed in overpressured gas sands. We gambled and it paid off, not once but twice. See, the marine insurance expired just weeks before testing concluded, so we extricated the rig without any liability protection. And got away with it.

We were on a roll. During the next year Mobil acquired 34,000,000 frontier acres, of which half were off Newfoundland. By a coincidence of fate, Gulf acquired large acreage tracts and made a significant gas discovery during this period in the Mackenzie Delta, which is where Mobil's management wanted to be positioned at any price. Gulf, on the other hand, was salivating over the East Coast potential. What followed was a 25% across-the-board acreage exchange. Gulf became a Hibernia acreage partner, and the rest is history.

Returning to Sable Island, better equipped, in 1971 resulted in Mobil's West Sable E-48 oil discovery. Drilled to 11,800 feet, it contained 500 net feet of pay and 28 hydrocarbon-bearing sands. Reserves were estimated at 25 - 50 million barrels. And the hunt was on. Thebaud, six miles south of Sable, followed in 1972 with 1/2 TCF of reserves. Venture, the Atlantic's biggest gas discovery to date, was drilled at the eastern end of Sable.

In the following years the waters offshore Labrador and Baffin Island attracted increased attention and resulted in 26 wells with estimated potential reserves of 42 TCF and countless icebergs weighing up to 10 million tons.

In 1977 I became Petro-Canada Employee #1. Management embraced my East Coast focus. It was fitting exposure, as Canada's national oil company, to participate in the Hibernia discovery in 1979. The road to the current richness of the oceans was not without pitfalls and heartache. The Trudeau Government's unveiling of the National Energy Program in 1980 with its subsequent Federal Government 25% back in to east coast discoveries all but brought a drilling moratorium. The Ocean Ranger sinking in 1982 was a far different disaster, touching all of us in the offshore fraternity beyond what words could describe. Our efforts and sacrifices have not been in vain. Atlantic Canada now stands on the threshold of wealth and prosperity. Best of all, we did it our way."

FIFTY YEARS AGO

In 1949, the *Nickle Oil Bulletin* reported:

"Canada's two leading independent oil producers, **ANGLO CANADIAN OIL COMPANY** and **HOME OIL COMPANY** have established their Redwater acreage as 'proven'. The two Calgary companies, which launched their careers in the Turner Valley field, are starting off 1949 with the brightest prospects in their long history. It appears that the two independents will share an ultimate oil recovery from their half section of land at Redwater of at least seven million barrels, and may share in as much as ten million barrels. Redwater crude is currently worth \$ 2.68 per barrel at wellhead. From that lush melon the Alberta Government will slice its normal royalty, currently 12 1/2%." [January 3rd, 1949]

"Royalty becomes an independent. Imperial sells 90% of stock to Canadian investment firm. Royalty Oil Company Limited, 28 year old member of the Imperial Oil Limited family, is leaving the family and striking out on its own in what will likely be widespread exploration and development in Western Canada. Imperial has completed arrangements with the Dominion Securities Corporation Limited for the sale of its 90% stock interest in Royalty to that eastern Canadian investment firm. The deal involves Royalty, which has around 100 wells in the Turner Valley field and has two drilling rigs running in the field, together with a rig on exploratory drilling at Priddis; and the Royalty subsidiaries, Valley Pipeline Company, operator of the oil pipeline linking Turner Valley with Calgary refineries; Madison Natural Gas Company, which operates Royalty's big Turner Valley gas division; and Dalhousie Oil Company, a producer in which Royalty has 51% control" [January 17th, 1949]

"Calgary Petroleum Club is formally launched, The "Calgary Petroleum Club" was formally launched Friday evening when over 100 members of the oil fraternity met at the Palliser Hotel to approve the application for incorporation, by-laws, and to elect the Club's first Board of Governors. The club in Canada's Oil Capital has a distinct international flavor, reflecting the Canadian-American-British backing of Western Canada's fastest growing oil industry. Six members of the Board of Governors were elected for a two year term: John H. Bevel, of Canadian Gulf Oil Company; J. Grant Spratt, Anglo Canadian Oil Company; S. F. Heard, Royalty Oil Company; T. L. Brook, British Dominion Oil & Development Corporation; Clifton C. Cross, Globe Oil Company & Associates Companies; and Carl O. Nickle, *Daily Oil Bulletin*." [January 22nd, 1949]

"Imperial Oil completes plans for Leduc Gas Gathering System and Gasoline Plant. Imperial Oil Limited, discoverer of the Leduc Oilfield, has completed plans for a \$ 6,500,000 project to put the field's natural gas to good use. Planning has been completed for a gas gathering system, compressor station and a gasoline plant in the Leduc field. The plant will have a capacity of twenty-four million cubic feet per day, and will recover propane, butane and natural gasoline. What percentage or volume of gas will be restored to the formation has still to be determined. Imperial has already installed two compressors at Leduc, and is conducting experiments on gas injection into D2 and D3 zones of Devonian. Results of those experiments will have a large bearing on the re-pressuring system finally adopted. At present Leduc's gas is being burned in flares or utilized for field operations. As yet, there is no industrial or domestic market available to Leduc gas." [February 3rd, 1949]

"Union Oil of California plans Alberta Exploration Expansion, opens Headquarters at Calgary. Union Oil Company of California, a major American firm, plans an expansion of its exploration efforts in Western Canada and - to that end - is establishing Canadian headquarters in Calgary. Temporary offices have been opened at 602 Palliser Hotel, and permanent offices elsewhere are expected to open about March 1st. W. W. Heathman, who had been in charge of Union's Washington state exploration, has moved to Calgary as Exploration Manager for Western Canada." [February 14th, 1949]

"Growth of Imperial Oil's Edmonton area production: [February 23rd, 1949]

Month	Barrels Daily	No. Wells	Month	Barrels Daily	No. Wells
Jan/47	-	-	Mar/48	3930	38
Feb/47	151	1	Jun/48	4567	57
Jun/47	584	4	Sep/48	10555	97
Sep/47	930	10	Dec/48	16850	130
Dec/47	2110	21	Jan/49	18324	138

" Alberta Oil Production climbs over 50,000 barrels daily for the first time in history" [February 26th, 1949]

"Union Oil of California to drill Imperial Land, explore with Hudson's Bay and British American. Union Oil Company of California, large American oil firm which announced two weeks ago that expansion of Alberta operations was planned, has wasted no time putting plans into effect. So far Union has reached an agreement with Imperial Oil for the immediate drilling by Union of a Devonian test twenty miles northwest of Edmonton; and agreement with Hudson's Bay Oil & Gas Company for joint exploration of about 600,000 acres in four areas in northwest Alberta; and an agreement with Hudson's Bay and the British American Oil Company for joint exploration of some 200,000 acres in eastcentral Alberta." [March 5th, 1949]

"Imperial Oil's Schoepp No. 1, lsd 9-22-51-27 W4th, D3 Devonian zone oil discovery at Golden Spike, added another ten feet to known thickness of oil pay on Wednesday, raising total thickness to 171 feet." [March 10th, 1949]

"Golden Spike discovery well boost pay thickness to 261 ft, continues testing..." [March 19th, 1949]

"Imperial's Golden Spike discovery increases known pay thickness to 353 ft, cores on..." [March 24th, 1949]

"Imperial Schoepp discovery at Golden Spike increases known pay thickness to 470 feet." [March 30th, 1949]

LIST OF SIGNIFICANT WELLS, IN CHRONOLOGICAL ORDER:

WELL	YEAR	OWNER	STRUCTURE/ZONE
1 ALDERSON	1883	CPR	MILK RIVER GAS
2 MEDICINE HAT	1885	CPR	MEDICINE HAT GAS
3 OIL SPRINGS (WATERTON) 1899		PRIVATE	PROTEROZOIC OIL
4 PELICAN	1905	DOM. GOV'T	VIKING GAS - BLOWOUT
5 BOW ISLAND	1905	CPR	BOW ISLAND GAS
6 FRASER RIVER DELTA		PRIVATE	DRY HOLE
7 CALGARY	1900	BREWING CO.	BELLY RIVER GAS
8 TURNER VALLEY	1914	HERRON	FOOTHILLS, CRETACEOUS OIL
9 TURNER VALLEY #4	1924	IMPERIAL	(ROYALITE)-FOOTHILLS, MISS. GAS
10 TURNER VALLEY #36	1936	BROWN	FOOTHILLS, MISS. OIL
11 VERMILION	1920	PRIVATE	CRETACEOUS-HEAVY OIL
12 LLOYDMINSTER	1920	PRIVATE	CRETACEOUS-HEAVY OIL
13 YOUNGSTOWN	1940	CHARTER	DEVONIAN OIL
14 PRINCESS	1940	CHEVRON	DEVONIAN OIL
15 TABER	1940	CHEVRON	CRETACEOUS OIL
16 NORMAN WELLS	1940	IMPERIAL	DEV. REEF OIL-DEVIATED WELL
17 FROVOST	1942	IMPERIAL	VIKING GAS (OR VIKING KINSELLA)
18 PEACE R.	1930		CRETACEOUS GAS
19 HODGE MOUNTAIN	1940	PRIVATE	LOWER PALEOZOIC OIL
20 JUMPING POUND	1944	SHELL	FOOTHILLS GAS
21 STOLBERG	1942	HOME	NORTHERN FOOTHILLS
22 BAGE CK	1948	MCMANON	INTERMOUNTAIN
23 BROCK	1950	SASKATCHEWAN	GAS
24 SALTSRING	1952	RICHFIELD	B.C. WILDCAT
25 SKEENA	1950'S		INTERMOUNTAIN BASIN
26 LIARD	1950'S	AMOCO	STRUCTURE GAS
27 WINDY POINT			NWT DEVONIAN REEF WILDCAT
28 PINCHER CK	1950'S	GULF	FOOTHILLS GAS
29 WATERTON	1957	SHELL	DEEP FOOTHILLS GAS
30 SUKUNKA	1960'S		BC FOOTHILLS GAS
31 LEDUC #1	1947	IMPERIAL	NISQU OIL
32 LEDUC #3	1947	IMPERIAL	REEF OIL
33 ATLANTIC #3	1948	ATLANTIC	REEF BLOWOUT
34 REDWATER	1948	IMPERIAL	MAJOR REEF OIL
35 STETTLER	1949	GULF	REEF OIL
36 GOLDEN SPIKE	1950	IMPERIAL	REEF OIL
37 FORGET	1953	IMPERIAL	MISSISSIPPIAN OIL
38 RADVILLE	1945	IMPERIAL	WILLISTON BASIN
39 RATCLIFFE	1954	MOBIL	LOWER PALEOZOIC OIL
40 VIRDEN	1952	CHEVRON	MANITOBA MISSISSIPPIAN OIL
41 DOLLARD	1953	TIDENWATER	JURASSIC OIL
42 BASTRY	1950	IMPERIAL	PORTABLE DRILLING RIG
43 PEMBINA	1953	MOBIL	CARDIUM OIL
44 SIMPSON	1926	PRIVATE	CRETACEOUS OIL
45 DAVIDSON	1920'S	GEOL. SURVEY	WILDCAT
46 OKOTOKS	1950'S		DEVONIAN SOUR GAS
47 CROSSFIELD	1950'S		MISSISSIPPIAN SUBCROP
48			
49 NE B.C.	1950'S		TRIASSIC OIL
50 QUEEN CHARLOTTE	1950'S	RICHFIELD	WILDCAT
51 GRAND FORKS	1960'S		CRETACEOUS JURASSIC OIL
52 SHAN HILLS	1958	HOME	BEAVERHILL LAKE OIL
53 UTIKIMA	1964	ATLANTIC	GILWOOD SAND - OIL
54 RAINBOW LAKE	1966	BANFF	REEF OIL
55 GAP	1970	MCPEEL	MOUNTAIN WILDCAT
56 STRATHMORE	1964	CDN PACIFIC	BELLY RIVER GAS
57 PEMBINA	1975		BELLY RIVER
58 WINTER HARBOR	1970'S	DOMS	ARTIC WILDCAT
59 MELVILLE	1975	PANARCTIC	ARTIC GAS
60 TURKOTARTAK	1975	IMPERIAL	MCKENZIE DELTA OIL
61 BEAUFORT SEA	1980	DOMS	OFFSHORE ARCTIC OIL
62 PEMBINA	1978	CHEVRON	NISQU OIL
63 BENT HORN		PANARCTIC	ARCTIC PALEOZOIC OIL
64 ELLSMERE		GULF	NORTHERNMOST WILDCAT
65 LODGEPOLE	1980'S	AMOCO	BLOWOUT
66 LODGEPOLE	1982	AB. GOV'T.	PORT GAS WELL
67 PC TEST	1990'S	W. HUNT	PF OIL THEORY WILDCAT
68 ALDERSON	1950'S	SCURRY	SECOND SPECKS GAS
69 ELMWORTH		CDN HUNTER	MAJOR DEEP GAS
70 COMMOTION CK	1940		FOOTHILLS WILDCAT
71 CLARK LAKE			HEBC REEF GAS
72 ATHABASCA	1960'S		TAR SANDS BOREHOLES