



Observations from the Top of the Derrick: Searching for “Oil Dorados”

by J. W. Porter *

J. H. A. Bone coined the phrase “Oil Dorado” in his book, *Petroleum and Petroleum Wells*. It was published in 1865 — only 6 years after Drake’s discovery near Titusville, Pennsylvania — and Bone used the term in reference to Titusville’s boom years of the early 1860s.

Unlike the mythical “El Dorado” — the South American land believed to be gilded with gold — Bone’s “Oil Dorado” was a reality. But just as the promise of an “El Dorado” drew treasure hunters from afar, so did the promise of an “Oil Dorado.” The early oil seekers used many exploration methods, a few of which are

described here.

Surface Seepages

Early exploratory wells were often drilled at the locations of seepages, usually found along
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Aubrey Kerr

who will speak to us on the subject:

***Back to Basics - The Leduc
Discovery Revisited***

Date: Wednesday, September 24, 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, Monday, September 22th.
 See you there!!

Member News: Aubrey Kerr advises Society members that a reprinting of his book *Atlantic No. 3* should be off the presses and on the shelves of De Mille Technical Books by mid-November, in time for Christmas. Aubrey is currently taking orders.

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creeks and rivers. Both William's discovery at Oil Springs, Ontario, in 1858, and Drake's discovery the following year at Watson's Flats near Oil Creek, Pennsylvania, were made at sites of oil seepages.

Seepages were used to locate drill sites in Western Canada too. The Dingman discovery well at Turner Valley was drilled in 1913 near gas seepages along Sheep Creek in southwestern Alberta. The Norman Wells oil field was discovered in 1920 close to oil seepages along a tributary to the Mackenzie River.

Earlier but not quite a discovery, the John Lineham well was drilled in 1902 near the location of oil seepages on Cameron Creek in the Waterton area. Oil production from Lineham's well created an ephemeral boom and resulted in promoters naming the area Oil City. By 1908 some 16 wells had been drilled with questionable results or, at best, producing a few barrels a day before expiring.

Oil Smellers

Bone's book tells of men with extraordinary olfactory senses being used to locate drill sites. "Smellers" prowled the ground like unleashed Bloodhounds sniffing for hydrocarbons. Whether they believed they had supernatural powers or acknowledged themselves as charlatans, they failed as oil finders and their role was short-lived.

Dowsing

Dowsing is probably the oldest nontechnical method for locating minerals, water or hydrocarbons. The dowser's tool is called a

divining rod, or forked stick, witch hazel, witching stick, dowsing rod or wiggie stick.

In 1556, Agricola, a German scientist involved in mining and ore deposits, published an illustration in his book *De Re Metallica* (all about metals) showing miners using forked twigs to find minerals. Interestingly, in his text, Agricola labels this method of locating ore bodies a waste of time.

Dowsing is still used today and has not changed since the sixteenth century. A dowser holds the divided ends of a Y-shaped branch and walks across a prospective area holding the stick horizontal to the ground. Theoretically, when crossing a buried stream, mineral deposit or hydrocarbon pool, the tail-end of the stick pulls strongly towards the ground. The divining rod supposedly acts as a medium to transmit the discovery to the diviner's psyche. Today's diviners have restricted themselves to the search for water in rural areas.

Dowsers in Western Canada

Dowsers played a role in oil and gas exploration in Western Canada. An independent Calgary oil company employed a diviner in the 1950s to find oil. His divining rod had bicycle handlebar grips on the forked ends. He was reported to have dowsed a gas field, which was confirmed by drilling a rank wildcat in southern Alberta. Perhaps the use of the handlebar grips facilitated his psychic power to steer better towards his objective.

Psychics introduced oil companies to numerous other "black box" tools during the heydays after the Leduc discovery in February 1947. The very name "black box" conveys not only secrecy but also suspicion

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Canadian Oilmen Appear In Borneo's History Books

by Clinton Tippet and Mark Wolfe
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with Shell Canada's permission

While the history of oil conjures up international names like Rockefeller, Nobel and Rothschild, at least one major conglomerate owes much of its early success to a gang of Canadians.

Last week (*the week of February 2nd, 1997 - Ed.*) marked the 100th anniversary of the discovery of oil near Muara Djawa, on the island of Borneo. Canadian bore masters and righands from Petrolia, Ont. had spent six weeks fighting mosquitoes, rain and jungle fever drilling the 150-foot well.

Commissioned by M. Samuel & Co. in an attempt to diversify its sources of supply for its Far Eastern markets, the discovery was to be timely. It would not only help Marcus Samuel retain a hold on the Russian kerosene trade of the time but spur the creation of a new entity — the Shell Transport and Trading Co.

Canadian Know-how

According to Marcus Samuel biographer Robert Henriques, Canadian expertise was sought for a couple of reasons.

First, the Samuels had retained Paul Dvorkovitz, a renowned chemist and petroleum expert who was familiar with both the fledgling Canadian oil industry and its home-grown version of the cable tool drilling rig in use in Petrolia, the United States, and elsewhere.

Second, the Samuels were loath to cooperate with the only truly multinational oil products concern at the time — the US-based Standard Oil Company — whose meteoric rise in fortunes, market dominance, and fierce competitive tactics had made them “the enemy.”

For Dr. Dvorkovitz, and therefore the Samuels, the Canadians presented a loyal and innovative bunch who would be less open to bribes by any of the Standard Oil “agents” in the area — especially those stationed in Singapore. These “agents” watched the comings and going of men and equipment to Borneo and neighbouring Sumatra, where a small company known as Royal Dutch was also staking its own claims in oil exploration.

Some of the bore masters, technicians, geologists and distillation experts from Petrolia, Ont. were seasoned men who'd worked in other parts of the world. None, however, could have imagined the difficulties encountered in Borneo.

Tough Terrain

The island in 1896 was almost pristine when Mark Abrahams — a nephew to the Samuels and the engineer responsible for the family's shipping installations in eastern Europe — travelled up the Sanga Sanga River with the Dutchman Menten who owned the concessions, and the first Canadian involved — a “grizzled, veteran oilman,” Mr. Baird.

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Canadian Oilmen Appear in Borneo's History Books

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The jungle frustrated the operation from the outset. The planned drilling site, where oil seepages had been observed, was only four miles from where Menten had already built a dock on the Sanga Sanga. But it took eight hours, four by water and four by land, to get to the place known as The Black Spot.

Even though word of the promising location was sent immediately to London, it was months before equipment previously acquired from Canada by Samuels arrived and was put in place.

Drilling finally began on December 30, but by then the confusion, delays and disorganization of irregular and untimely supply shipments only added to the persistent rain and jungle fever which, according to Henriques, had felled all the Europeans on the project except Menten and the Canadian Baird. Eventually the fever hit them, too. Indeed Baird died during the drilling of the well after only four days' illness.

Eureka!

Nonetheless, drilling continued and on February 5, 1897, the well hit productive sandstone at 150 feet.

The discovery put Marcus Samuel, who'd already begun talks with his counterpart at Royal Dutch, in a strong enough position to hold off on any alliance which might otherwise have been necessary to supply Samuels with petroleum for those Far Eastern markets.

For the next year and more, additional Canadians would be enlisted for the

operations in Borneo — including the Canadian-drilled gusher at Balik Papan. This natural coastal harbor southwest from The Black Spot would be the site for the wells that would ensure a place for the Shell Transport and Trading Co. in the annals of world oil history.

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and cynical amusement to the professional explorationist.

Dowsing in the Office

I recall when a member of the Society of Dowzers arrived in our company's Regina office some 45 years ago. He introduced our geologists to his portable oil-finding device. It was a small oak box, adorned with brass fittings, which could be mounted on a surveyor's tripod. The dowser explained his instrument could be used in the office or the field. By placing his instrument over a topographic map, he claimed he could indicate precise locations of oil pools and their respective depths.

Most exploration old-timers can tell stories of dowzers or self-proclaimed oil finders. One such psychic employed a pendulum. He claimed that by sweeping his swinging pendulum across a topographic map he could identify the location for a successful wildcat well. The drill site was at the point on the map where the pendulum would suddenly change the direction of its swing.

The Oil-finding Frog

Beyond the realm of the parapsychologist, counterfeit operators employed such

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paraphernalia as vials of coloured fresh water, salt water, and various types of crude oil to predict the locations of successful wildcat wells. Bogus instruments — even frogs — secreted in boxes with brass dials to “tune in” oil deposits have also been used to dupe the unwary.

I heard of an amusing bit of chicanery from one of my professors in the mid 1940s. This charade took place near Kamsack, Saskatchewan, during the initial stages of cable-tool drilling there in the late 1930s. A self-proclaimed geologist used a bullfrog in a cigar box in his scheme. The box had a copper floor wired to a battery. A concealed door-bell button, wired to the plate, was fixed to the underside of the box. The charlatan carried the cigar box as he traversed the area to be explored. At a self-determined point, he would discreetly push the button, giving mild electrical shocks to the frog. The frog would jump and the box would vibrate. “Here,” the trickster would announce to his party of potential investors, “is the crestal position of the anticline.” Then he would drive a stake into the ground to mark the site for the drilling of a wildcat well.

One’s degree of gullibility in risk ventures appears to be commensurate with one’s degree of avarice and curiosity. The self-proclaimed oil finders with their gadgets and black boxes recognize that suckers can be caught with bait of all types. Charlatans can be exposed and vilified, but psychics enjoy the protection of man’s fascination with the supernatural.

Geological Exploration

Similar to drilling near seepages, early explorers often chose drilling locations

along axes aligning existing fields. Drillers also considered topographical anomalies indicative of productive areas. However, by the early 1870s the application of rudimentary subsurface geology to oil exploration was initiated. Samples of rock cuttings of oil producing reservoirs, obtained by cable-tool drilling, were compared in regard to elevation, thickness, and lithology. The synthesis of this data enabled the drillers to delineate prospective trends which were referred to, at the time, as “belts.”

In 1844, Sir William Logan, the first director of the Geological Survey of Canada, reported the occurrence of oil seepages at the crest of an exposed anticline in the Gaspé Peninsula of Quebec. This anticlinal theory of hydrocarbon entrapment was formally presented in a paper given in 1861 by T. Sterry Hunt, a colleague of Logan. However, the concept was viewed with some degree of skepticism. It was not until the mid 1880s that the importance of Logan’s observation of anticlinal oil entrapment was recognized in the United States.

Until the first decade of the twentieth century, drillers — with their rudimentary knowledge of geology — played a significant role in choosing locations of wildcat wells. Then oil companies began hiring geologists to map surface and subsurface geology. Geologists gathered data through surveys and mapped structural features, such as domes and anticlines expressed at the surface. Many of these anomalies became the sites of discovery wells.

The plane table-alidade-stadia rod method of surface mapping was standard practice until the early 1950s. Then it was superseded by
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aerial photogeology reconnaissance mapping. The helicopter made it very easy for field geologists to examine and photograph relatively inaccessible exposures of bed rock. Photogeologists used the mosaic of aerial photographs to map the surface more accurately.

Landsat imagery commenced in the early 1970s. Satellite pictures of vast areas of the earth's terrain display the major structural features of sedimentary basins. Such features are significant to petroleum and mining geologists.

Seismic Exploration

Undoubtedly, the greatest innovation made in the search for hydrocarbons has been geophysics. Its initial application, with the use of the torsion-balance and refraction seismograph, proved successful in the Gulf Coast area of Louisiana and Texas in the mid 1920s. Reflection seismic superseded the refraction method and has, since 1929, been the most successful tool for the resolution of potential drilling sites. Today's computerized three-dimensional, coloured seismic data can not only display the size of the anomaly but also its morphology. Thus the type of trapping mechanism can be interpreted and, with the geologist's stratigraphic input, the potential reserves of the anomaly estimated.

Synthesis

The geological information gleaned from 140 years of protracted exploration for hydrocarbons, coupled with great advancements in geoscience technologies, provides today's geologists and geophysicists with a wealth of information

on the world's petroleum and natural gas occurrences. Now, the computerized synthesis of selective portions of this data bank enables the geoscientist to judge the merits better of a particular prospect to be tested by the drill.

The search for new oil and gas fields is ever dependent on technological innovations, as well as improvements in existing methodologies. Despite the great advances made in the last half of this century, no method has yet been devised to preempt the drill in unequivocally locating oil and gas pools.

Geoscience relies on all branches of the physical sciences to substantiate its hypotheses, and yet many of its problems are left unanswered. Consequently the science of geology is often considered to be straddling art and science, as it is an inexact science. The geologist, like the artist, creates a hypothesis through conceptualism, albeit with the support of the physical sciences. It was best expressed by a great American geologist, Wallace E. Pratt, in his address entitled *Toward a Philosophy of Oil-Finding*. He spoke to the South Texas Geological Society in 1951, and his talk was published in the *Bulletin of the American Petroleum Geologists*. To quote:

“Where oil is first found, in the final analysis, is in the minds of men.”

* **Jack Porter** is a long-standing director of the PHS and author of *A Backward Glance: A History of Canadian Superior Oil Ltd.* He has also contributed to professional journals numerous articles on the history of oil and gas exploration in Western Canada. Jack is willing to share his research sources and welcomes discussion of exploration history. Phone 255-7384.



FIFTY YEARS AGO

In 1947, the Nickle Oil Bulletin reported:

“Imperial Oil Ltd. has started surveys for an oil pipeline to connect the Leduc Oilfield with the railway point of Nisku Oil is currently being delivered by truck to the railway, for shipment to the Imperial Refinery at Calgary. Consideration is being given to a new refinery for Edmonton.”
{ June 20 }

“The Leduc Oilfield got its first Posted Oil Price this week - \$2.675 per barrel for the 40 - 41 API gravity product being obtained at the field’s wells.”

“Husky Refining Company started experimental runs at its Asphalt Plant at Lloydminster on July 4th, and expects to get the plant into full scale operation in about ten days.”
{ July 11 }

“Alberta’s drilling bits grind through to an all time footage record in June - 100,830 feet . . . nearly 22,000 ft. more than . . . the previous record month.”

First six Imperial-Leduc wells produce 23,632 bbls. in July, cumulative yield 58,288 . . . Gas-oil ratios . . . are low . . . except for brief flush runs, all wells have been operated at sharply restricted rates since completion; in part, because pipeline transport facilities haven’t yet been completed . . . Main reason, however, for restricted flow is “Conservation.” Carefully controlled production means a slower rate of recovery but a substantially greater ultimate recovery.”

Imperial Oil Ltd. Has purchased the U.S. Government’s “Canol - 1” Refinery at Whitehorse and will transfer the plant to Edmonton to form the nucleus for its planned refinery in central Alberta.”
{ August 15 }

“Alberta - Saskatchewan oil production has commenced climbing again following a five year decline . . . production from other sources is increasing at a grater rate than the progressive decline in Turner Valley.” { August 22 }

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