Jumping Pound

The First Significant Reflection Seismic Discovery in Canada

In the early 1940s both Shell and Gulf began following up the structural play presented by the Turner Valley Field, and papers by Dr. George Hume of the Geological Survey of Canada. Gulf, using refraction seismic methods, worked from Turner Valley south, and Shell, using reflection, worked north.

It was in the fall of 1940, however, that Rabson Oil Co. (Brown, Moyer and Brown), with land in the Jumping Pound area, hired a Heiland Research Corp. 12 trace crew to find out if reflection would work in the area. It did, and through a seismic option, Shell continued the reflection program using, primarily, Heiland, with a short contribution by United Geophysical.

To those who have seen those original recordings, the interpretation of the 12, and later 24, trace records was a remarkable feat. Individual traces were timed, corrected for weathering and elevation and point plotted in time with the NMO removed. These plots were then converted to depth and migrated and re-plotted on a depth section for interpretation. For the successful interpretation of these data much credit goes to H.R. Thornburgh of Shell and Cec Chesher of Heiland (later of Shell). With all our modern techniques, the overthrust belt still inflicts casualties today!

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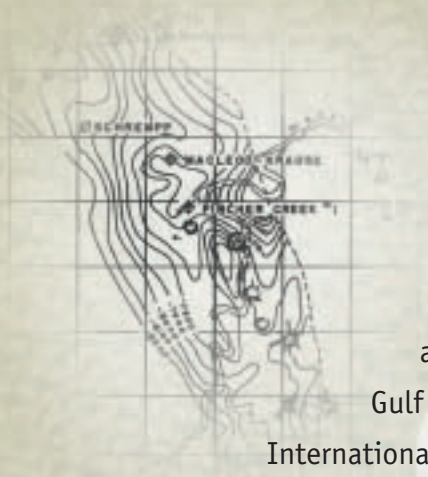

Pincher Creek

A Major Canadian Discovery Delineated by a Refraction Seismic Program

In the early 1940's the Turner Valley Field attracted Gulf Oil Corp.'s attention. In 1942, to follow the potential strike of this type of feature, Gulf conducted an extensive gravity survey south from Turner Valley to the International Boundary. The results were sufficiently impressive that Gulf began shooting a seismic refraction program in the summers of 1943 and 1944. Winter conditions, naturally, made operations impossible until 1945 when Canadian staff were hired.

After shooting a template over Turner Valley, work proceeded, utilizing both in-line and broadside refraction techniques. The program eventually extended from Turner Valley to, and included, the US Border. The data were interpreted both in the US and Canada with several well known CSEG members participating. These included Alex McKee, Stan Pearson, and future CSEG Presidents George Blunden and Harry Carlyle.

Gulf Pincher Creek No. 1 (15-24-3-29W4) was "spudded in" in April 1947 and completed as a gas and condensate discovery in September 1948. Open flow rates were 45 million cu. ft. of gas and 1670 barrels of condensate per day. For many years it was the largest gas discovery in the country.

Pincher Creek stands alone as the only seismic refraction discovery in Canada.

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Leduc

In the pantheon of seismic delineated significant discoveries in Western Canada the place of honour must go to Leduc.

Recommended by Ray Walters and Jack Webb, the location for Imperial Oil's Leduc No. 1 (5-22-50-26W4) was based on a seismic anomaly and a reasonable understanding (for then) of the geologic potential.

A regional seismic program ram-rodded by Ray Walters uncovered a "hicky" that was followed up with detailed shooting, first by Heiland then by an Imperial crew. The interpretation was done, primarily, by two future CSEG Presidents; Wes Rabey and Carl Chapman.

On February 13, 1947 Leduc No.1 was completed as a D-2 discovery. Production from the D-3 reef was not established until the completion of Leduc No.2 (1-16-50-26W4) in May of 1947.

1947

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First Canadian 3D Seismic

New Brunswick – 1949

Shell Oil's 1948–1949 seismic program in New Brunswick involved surveying along available roads, going in a variety of directions, over an unknown geological section with many steeply dipping beds. A program of shooting cross spreads at every other shot point was planned for the area between Moncton and the Northumberland Straight. Although Shell had shot a small number of cross spreads in Jumping Pound in 1941–1942, this was the first attempt at creating a three dimensional interpretation in an area of steep dips and variable strike. Heiland Exploration of Shreveport, Louisiana and Calgary, Alberta provided the crew.

Trace weathering and elevation corrections were applied and the picked reflections point plotted in time using a "wavefront" type guide to remove normal move out. The reflections were then converted to depth and migrated in line using a variable depth of centre spherical process and a Thornburgh projector designed to convert apparent dip to actual. Once the in line and cross line migrated positions of a reflection were determined then geometrical extrapolation was used to establish the actual 3D location of the event.

Even though field progress was slow the interpreters and computers (people, in those days) had to scramble to keep up.

1949

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CSEG Founding Fathers

At L.L. Nettleton's suggestion that a local SEG section would be an advantage to Calgary geophysicists, Wayne Phares, of United Geophysical, organized an exploratory meeting to discuss the possibility.

Held on June 2nd, 1949, at the Palliser, it proved to be the inaugural meeting of the CSEG, although that name was not approved and the Certificate of Incorporation not issued until December 22nd, 1949.

The first executive elected at that inaugural meeting was: President, J.O. Galloway; Vice-President, C.M. Moore; and Secretary-Treasurer, L.J. Richards.

Then, as now, anyone interested in geophysics was eligible for membership. While much has changed with the organization, the objective remains "...To promote the science of geophysics especially as it applies to exploration, and to promote fellowship and cooperation among these persons interested in geophysical problems".

Affiliation with the SEG was cemented in 1952. Ten years later the SEG held its first "outside the U.S." Annual Meeting in Calgary. The meeting was held at the Jubilee Auditorium and was a great success. Norm Christie was General Chairman (and became SEG President the following year). The welcome to Alberta was delivered by Premier E. Manning. The CSEG welcome, in French and English, was by President Peter Savage.

In 1950, 102 members paid a two dollar membership fee, with the Society showing a $112 balance after a year's operation – and it has never looked back.

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Doodlebuggin'

1950's Style

In the late 1940s and early 1950s T.H. (Harold) "Chief" Edwards spent an observant few years as a shooter for Heiland Exploration. The seismic crews he portrayed in his cartoons worked in such places as Jumping Pound and Leduc, gathering data of some significance, and gathering memories whose value can't be measured. To old Doodlebuggers these are more than cartoons; they are the stuff of the life they led.

Edwards left Heiland in the early 1950s, venturing into the shot hole drilling business; a business that provided him with many a drawing but not much else. Crew levels dropped and he gave up that enterprise to work as a salesman for S.I.E. (Southwestern Industrial Electronics). Outside work as an artist eventually led him to a freelancing career with work for organizations such as Seismic Service Supply, Geo-Space and Carey Machine. For a time he produced his own work under the label of T.H. Edwards Publications, located in Black Diamond.

1950's

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The Analog Decade

(Plus a few declining years)

In the mid 1950s analog tape recording came to the seismic industry. By the mid 1960s computer capacity had grown to the point where seismic data could be economically processed. Digital field units appeared; the revolution had started, and the analog systems began shuffling off into the sunset.

The first corrected section-making device, a Carter Oil Co. playback machine, arrived in Calgary in 1956. This utilized pulse width modulated analog field tapes. These corrected sections, in many different display modes, proved very popular, and led quickly to a remarkable variety of amplitude and frequency modulated recording systems, in addition to the pulse width. The tapes were recorded linearly, with the exception of the MagneDisc. Corrections were originally accomplished, trace at a time, through an intermediate recording, that had either a moveable recording or pickup head. This head had a fixed displacement for the static corrections and a servo controlled movement to correct for NMO. Eventually banks of these correction units were built to speed up the process. The resulting devices attained considerable size. One hesitates to make it, but the analogy to the dinosaur is somewhat apt.

Recording seismic data on tape led to more than sections; the Vibroseis™ and common depth point stacking being two of the more significant results.

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The Beginnings of Multiplicity

To address "ground roll" and other signal/noise problems two or three geophones per trace had become common in Canada by the late 1940s.

Experiments in the U.S. with multiple shot holes (and charges on or above the surface – the Poulter Method) began ca. 1950. One of the first Canadian experiments with multiple shot holes was conducted in March of 1952.

The photograph shows a nine-hole pattern, shot at that time by Imperial Oil in the Big Lake area, northwest of Edmonton. The pattern consisted of 5 holes on one side of the road and four on the other.

The results were good, and the practice of multiple shot holes spread quickly throughout the industry.

1950's

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The North King

First "purpose-built" ATV made in Western Canada

In 1953 three seismic crews (Heiland, National and Discovery) were equipped with Bruce Nodwell's "North King", off road, all-terrain vehicles. A two-component articulated vehicle, it was steered by hydraulic pistons, moving one half against the other. Each component had two pairs of large wheels mounted on walking beams. Each pair could be equipped with tracks when necessary.

The primary advantage over the small tracked vehicles of the day was the North King's carrying capacity. In areas of hard drilling the ability to move with a shot hole drill, such as the Mayhew 1000, made the appeal of the North King irresistible. Unfortunately experience in the field turned that appeal into a chimera.

It is a given that all seismic lines cut in hilly country have right angled turns at the bottom of every hill. Steering around, sometimes over, these corners became a serious problem. The hydraulic piston system works well for earthmovers but not for anything requiring more sophisticated maneuvering. The big wheels also proved adept at digging themselves into the muskeg.

As with many a prototype, the learning experience with the North King was invaluable, though costly, to their owners. It is only the brave that learn these things first.

1953

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First Doodlebug Golf Tournament

There was a time that the CSEG used to meet at the Bowness Golf Club ± and it was there, under President Bill Ogilvie, that the Doodlebug emerged.

It was created to foster fellowship and cooperation, and, for over fifty years it has been an institution exceeding the wildest dreams of its founders.

First Chairman, George Longphee, set the bar high for all time, by talking Hollywood actress Shelly Winters into handing out the first place flight prizes.

Other founders of the 1st Classic included Bud Coote, Ted Rosza, BJ Seaman and Rod McKenzie.

Seventy-two golfers competed for the first of a long line of ceramic trophies, that were to become one of the most sought after golf prizes amongst explorationists. The wind-up dinner and prize event was held in the Club House (now a Bavarian Restaurant!). It was a great party – that much hasn't changed.

Golfers of a wide variety of abilities were all at home in the first (and all subsequent) Doodlebugs, as witnessed by this exchange. On entering the Club House Stan D. was greeted by a friend with "How'd you do Stan?". "Great, I won". "What'd you shoot". "176!". On the tenth anniversary of the Tournament, Past President, and veteran golfer, Peter Bediz was presented with the book "Golf Is A Four Letter Word".

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