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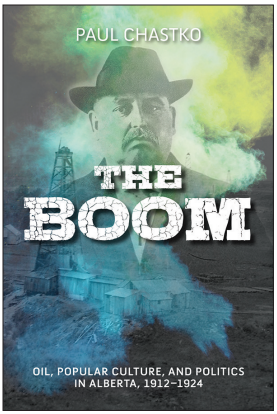

THE BOOM: OIL, POPULAR CULTURE, AND POLITICS IN ALBERTA, 1912–1

by Paul Chastko

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"Scientific Oil Finding:" Turner Valley's Anticline

> *Turner Valley is structurally probably the most complicated oil field in North America.*
>
> —Theodore A. Link
> *Association of American Petroleum Geologists Bulletin*
> November 1934[1]

Turner Valley, just outside of Calgary in the foothills of the Rocky Mountains, sits atop a massive oil deposit estimated to contain approximately a billion barrels of oil. Knowing a little bit of the basic geology of the Turner Valley field and the capabilities of the best available drilling technology of the time spoils some of the suspense of the first Turner Valley boom. The combination of the subsurface geology of Turner Valley and the limitations of cable rig technology made tapping into the main oil and gas reservoir in 1914 virtually impossible. Informed geological opinion generally held that if Alberta possessed petroleum reserves, they would reside in Cretaceous era rock, the Dakota sandstone, less than 2,000 feet from the surface (see Table 1-1). In Turner Valley, however, commercial quantities of oil and gas lay much deeper (6,820 feet) below in the Mississippian, making commercial development of oil virtually impossible given the limits of drilling technology and the incomplete knowledge about the subsurface features of the Valley. Only in the 1920s did it become clear that Turner Valley's Dakota formation did not contain a true Dakota conglomerate, making it unlike any other western Dakota oilfields. Furthermore, the faults in the valley were far more complex than preliminary surveys by the Geological Survey of Canada revealed. But the entrepreneurs, promoters, and investors of the boom, to borrow a phrase, did not know what they did not know about the Turner Valley anticline and

Table 1-1 Geologic Time, Turner Valley

ERA	PERIOD	FORMATION	DESCRIPTION
Mesozoic	Cretaceous	Edmonton Series	Thick littoral, estuarine, and freshwaters series with occasional coal seams
		Bearspaw Shales	Impervious marine and estuarine shales
		Belly River Group	Thick sandstone formation with some coal seams
		Claggett Shales	Marine-estuarian shales
		Cardomin Sandstone	A few thin beds with subsidiary conglomerates
		Dakota Group	
		Kootenay Group	An arenaceous group with many coal seams. Much thicker near the Rocky Mountains
	Jurassic	Fernie	Shales
Paleozoic	Mississippian	Rundle Group	Competent, massive limestones and dolostones
		Banff	Shaley mudstones grading upward to massive limestone
		Exshaw	Black, platy fissile shale
	Devonian		Interbedded clastics (chunks and smaller grains of broken off sedimentary rock), carbonates and evapoprites (layered crystalline sedimentary rocks) grading upward into interbedded limestones, dolostones and shales
	Cambrian		Mature tergenous clastics interbedded with dolostones and limestones

invested their time, attention, and money in drilling for oil, basing their projects on the best possible information available at the time.

Set in the foothills of the Rocky Mountains, Turner Valley, southwest of Calgary, consists of a series of rolling, grass-covered ridges and wide-open valleys. Two rivers, the Sheep and the Highwood, cross through the valley before joining eight kilometers east of Okotoks. The Turner Valley field runs in a narrow belt from north to south, parallel to the Rockies approximately forty-eight kilometres (twenty-two miles) long and 5.5 kilometers (2.5 miles) wide. Surface seepages along Sheep Creek ensured that Indigenous Peoples used the petroleum as medicine long before settlers arrived.[2]

Geophysicist Paul MacKay observed that the study of the structural geology of Turner Valley—that is, of the arrangement of the folds, faults, joints, and fractures of the field—is one of the most dynamic in western Canada. It is important to remember that MacKay's conclusions about the Turner Valley formation represent the culmination of several decades' worth of research, writing, and theorization about the creation of the formation—not all of which was available to drillers and promoters in 1914. "The Turner Valley structure is fascinating," wrote MacKay in 1991, "in that it is consistently represented as a classic example of the latest geologic theory."[3] Little wonder, because the process that formed Turner Valley took place over billions of years. Over time, the rocks, sand, sediments, and shales accumulated as Alberta cycled between periods of land and sea. Life evolved from microscopic single-celled organisms and algae to vertebrates and more complex vegetation. As plants and animals died, they mixed with sand and water, forming layers of sediment subjected to intense heat and pressure. The Devonian period (419 to 359 million years ago) saw a large network of tropical reefs, rich in marine life and lush vegetation covering Alberta. Eventually, these Devonian reefs produced most of the oil and natural gas deposits in the province. During the Cretaceous period (140 to 65 million years ago), a large inland sea covered much of North America.

Plate tectonics also played a significant role, particularly the interaction of the faster Pacific plate (moving northwest at seven to eleven centimetres—three to four inches—per year) with the slower North American plate (moving west-southwest at 2.3 centimetres—one inch—per year) where the two meet as if on a conveyor belt. Normally, the edge of the heavier and denser Pacific plate sublimates (moves beneath) the lighter and more buoyant North American plate. But around 65–35 million years ago, landforms from the Pacific plate too big to pass under the North American plate crashed into the edge of the North American plate, causing the compression of the continent.

The *Imperial Oil Review* likened the results of this collision to dropping a pebble in a pool of still water. "It caused geological ripples which were intense near the point of origin and moderated as they spread outward."[4] Known as the Laramide Orogeny the slow-motion collision, over thirty million years, produced breaks in the earth's crust known as thrust faults. The faults pushed thick sheets of older Paleozoic limestones eastward over younger Mesozoic rocks, producing at least two notable consequences for the Turner Valley field. First, it created the Rocky Mountains, which extend nearly 7,000 kilometres from Alaska to New Mexico. Second, it produced the Western Canada Sedimentary Basin (WCSB), when a wedge of mid-Proterozoic to Cenozoic strata covering 1.4 million square kilometres (640,000 square miles) from the Northwest Territories to the United States "detached from its basement, displaced northeastward, compressed and thickened."[5] Six kilometres thick at its western end in the Cordillera in the foothills of the Rocky Mountains, the strata of WCSB gradually thins to nothing along the edge of the Canadian Shield in the east. The folding and thrusting of the Laramide Orogeny placed thick layers of rock over layers of organic matter contained in lower strata. The combination of the increased pressure and time resulted in one of the largest oil and gas fields in the world, most of which lay underneath the surface of Alberta.[6] Estimates are that the WCSB contained 1.71 billion barrels of oil and 632 trillion cubic feet of gas.

Over tens of millions of years, water and wind steadily eroded the Rocky Mountains. Composed of sandstone, the glaciers of the Pleistocene (Ice Age—2.5 million years ago) carved valleys and troughs through the soft rock. Some glaciers believed to be nearly four kilometres thick eroded rock and minerals from the mountains and deposited sandstone, siltstone, and shales in the valleys and foothills of the mountains, covering the area with a glacial till that hid the subsurface features. Making matters more challenging, oil and gas is not normally found in the strata where it is formed; rather it is typically found after it has migrated through pervious beds and becomes trapped in an impenetrable rock barrier, where it will accumulate in a reservoir that can be flat, folded (anticline or syncline), or faulted strata. While some oil and gas will escape through faults (breaks) between the rocks to the earth's surface, most will remain in the trap. Most oil and gas reservoirs are composed of sedimentary rock (sandstones, grits, conglomerates, dolostones, and limestones), and in the Turner Valley field, dolostones and limestones are the most important.

The Turner Valley reservoir is not a pool of oil as much as it is a narrow ribbon of gas, oil, and water extending from the northeast flank of the

formation down to the southwest. Oil historian Earle Gray suggested visualizing the arrangement of gas, oil, and water in the reservoir as sealing a jar half-filled with equal parts oil and water, tilted on a forty-five-degree angle. The trapped air at the top is the gas cap. The gas cap of the ribbon starts in the northeast corner of the formation, underneath about a mile (5,280 feet) of rock. Sandwiched between the gas cap and the water table is the main body of oil, which starts approximately 6,000 feet underground. In April 1957, G.S. Hume of the Geological Survey of Canada noted that the difference in elevation between the highest and lowest well drilled was approximately 5,000 feet. Nevertheless, the producing oil and gas beds occur at a minimum depth of 3,450 feet and extend down to 9,000 feet.[7]

The Geological Survey of Canada (GSC) played a crucial, and sometimes overlooked, role in bringing about the exploitation of Alberta's petroleum industry. Founded in 1842 as a modest, publicly funded but independently directed scientific survey, the GSC thrived and expanded in fulfilling its ambitious official mandate of carrying out "a Geological Survey of the Province of Canada." The task of mapping Canada's geology was a daunting one, but the Survey benefited greatly from partnerships with Indigenous Peoples, who offered critical support by teaching survival skills and serving multiple roles as "guides, hunters, warriors, and as co-leaders."[8] The combination of Indigenous ways of knowing about the land and its resources and the technology of the settlers spurred Canada's economic and industrial development. Through its widespread publication of maps and reports, the GSC drew attention to the area's natural resources and opportunities. After 1871, the survey played a crucial role in transforming the Canadian West by reconnoitring navigation and communication routes and gathering, cataloguing, and disseminating information about the climate, soil, vegetation, wildlife, natural resources, and Indigenous populations of the territories of Rupert's Land transferred to Canada.[9] As Alberta oil patch historian Aubrey Kerr reminds, "These were *public servants*, officers of the geological survey of Canada, not entrepreneurs" who identified, catalogued, and carried out much of the important early work that resulted in Canada's natural resources industries.[10]

Despite a promising beginning—Ontario claimed the first commercial oil well in North America—to a certain extent federal regulations stunted the growth of the Canadian industry, but so too did the relatively poor quality and high sulphur content of Ontario crude, which inhibited the growth of export markets compared to "sweeter" (meaning less sulphur content) Pennsylvania crude in the 1870s and 1880s.[11] Furthermore, Canada's recent colonial past left behind an economy geared toward the export of raw materials and

natural resources and a small manufacturing sector. Developing the economy behind the high tariff barriers of the National Policy after 1867 resulted in higher-cost and more inefficient production methods, especially when compared to the US industry. As production declined in Ontario's older fields, Canadian imports of US crude expanded to meet growing demand. The proximity of abundant energy sources in the eastern United States, particularly the prolific oil fields of Pennsylvania and Ohio, combined with a greater density of railroad tracks and cross-border ties between Canada and the US sources, offered a cheap alternative, especially as additions to US proven reserves lowered the price of American crude. Until 1925, western Ontario provided the bulk of Canadian oil production, though it remained limited to the small fields around Bothwell, Oil Springs, and Petrolia.[12]

But there were promising signs in the West. Both the GSC and the Canadian Pacific Railway noted geological features in western Canada where natural gas proved abundant, as the railroad knew all too well. In 1882, as the CPR built the Prairie Route, the GSC looked for coal and water deposits along the route. As construction neared Langevin Station (now known as Alderson) outside of Medicine Hat, instead of water drillers struck natural gas that quickly ignited and burned down the derrick. With proven reserves in the area, the town of Medicine Hat drilled for natural gas, finding it in sufficient quantities to establish its own consumer gas industry after 1899.[13]

George W. Dawson carried out the GSC's mission in southern Alberta in 1881. Dawson also wrote the first mention of a reverse dip along the banks of Sheep Creek in a report published in 1883.[14] For practical geologists, however, the significance of the Turner Valley anticline was that it heaved the Cretaceous-period Dakota formation closer to the surface, giving prospectors the opportunity to drill into these rocks at shallower depths. By the early twentieth century, contemporary wisdom held that the Dakota sands held all of Alberta's petroleum deposits. As a 1913 GSC report on the oil and gas prospects of Alberta concluded on the eve of the boom, the three most promising areas were the Athabasca River district in northern Alberta, around Medicine Hat in central Alberta, and around Bow Island in southeastern Alberta. Of the three, it was only Bow Island, where Eugene Coste's Canadian Western Natural Gas drilled eight wells nearby producing seventy-six million cubic feet of natural gas every twenty-four hours, that enjoyed a degree of commercial success. More importantly, Bow Island established the Dakota sandstones as the key to Alberta's petroleum future. "The wells have a depth of 1,890 to 1,930 feet," summarized the report. "This is believed to be the Dakota sandstone."[15]

The GSC saw its role as being a catalyst to the private sector development of Canada's natural resources, and their reports succeeded in inspiring an amateur geologist by the name of William Stewart Herron. Born in Gelert, Ontario, on February 10, 1870, Herron was the second child in a family of thirteen (nine boys and four girls). Herron left home at age fourteen, to work as a cook's helper in a logging camp in the wilderness of northern Ontario, where he met Ella McKinnon, who came to work in the same camp as Stewart. The two fell in love and were married the following spring. In the meantime, Stewart advanced to be bull cook—the boss of the cookery—and learned the ropes of the logging industry. Between that and his ability to handle horses, he launched the first of a series of business endeavours using horses and sleighs as a contract log hauler. To supplement his income from log hauling, Herron also built ice roads in the winter by levelling the snow and flooding the trails; in the summer he cleared trees and cleared bush from a surveyor's line. In 1896 Herron became a pioneer settler of Cobalt in northern Ontario, where he cleared timber and built roads for the Temiskaming and Northern Ontario Railway and became a member of the town council. It was also during this period at Cobalt that Herron became interested in mining, claiming that he had discovered some mineral deposits near Cobalt but unscrupulous partners cheated him out of his share. "The story," observed journalist and Herron family biographer Frank Dabbs, "became part of his repertoire after he had succeeded in the oil exploration business. When he told it, it was tinged with his bitterness towards men who had tried to deal him out of that opportunity, too." A more accurate story, noted Dabbs, was that he sold his mineral proprieties before development to finance the family's move out west.[16]

Time and circumstances dictated the move to Alberta. Frail in her youth, Herron's first wife Ella grew weaker as she aged. By the time their third child, Archie, was born after daughters Irene and Laura, Ella was practically incapacitated. Then, when Archie died at a year and a half, Ella's physical decline accelerated. As Stewart spent a great deal of time away from home working, he arranged for a nanny to care for the children. Meanwhile, construction on the Temiskaming line ended shortly after the turn of the century, and as mining in Cobalt waned, Herron moved the family first to Haileybury, where he built a new home before returning Ella for treatment to Toronto, where she died shortly after doctors declared her incurable. Suddenly, Herron became a single parent with two young daughters. Given that he spent a good amount of time away from home, and that remarrying quickly was customary practice on the frontier, it is not surprising that Herron would look for a new wife and mother for his children. In short order, he met and married Edith

Figure 1-1 "William Stewart Herron, petroleum pioneer in Turner Valley, Alberta"

William S. Herron has long been considered the "father" of Alberta's petroleum industry. His persistence helped prove the existence of oil in Alberta. (Glenbow Archive CU1125948)

Isabelle Johnston, a widow three years younger than himself who had lost her husband in a logging accident. Edith had a daughter, Mabel, the same age as Laura. But, before marrying Edith in 1904, Herron found himself in the unusual position of having free time on his hands. After placing his children in the care of his own family, in 1903 he set out in search of a fresh start. He travelled through southern Ontario, where he visited the natural gas fields north of Lake Erie before crossing the border to visit the Pennsylvania oil fields. According to Breen, his experience in the Cobalt mine awakened an interest in petroleum geology. In an interview decades later, his son, Bill Stewart, recalled his father was "a fabulous reader" who became a self-taught geologist.[17]

Herron made his way west to Okotoks just south of Calgary, where he bought a 960-acre section of land from the Canadian Pacific Railway for three dollars an acre. In the late summer of 1904, Herron returned to Ontario, where he and Edith married on November 28, 1904. Shortly thereafter, he sold his house, road construction and cartage equipment, and horses in anticipation of moving out west. The family boarded a train in December 1904 to make the 3,000-kilometre journey to Alberta, where he intended to raise

workhorses on his ranch. It was a shrewd plan. As Dabbs observed, every aspect of economic life in southern Alberta at the turn of the century depended on cartage. Freight wagons using up to twenty-four horses hauled everything—grain, feed, seed, timber, stone, brick, cement, and coal—and Herron intended to use his ranch to raise animals for the transportation business. But his skill set, like his knowledge of forestry and road building, would prove as useful as his reputation as a hard worker.

The cartage business would take some time for Herron to develop as he built his stock of horses. In the meantime, he worked for William Livingstone and Joe Pugh at their lumber mill in the Crowsnest Pass, where Herron took a money-losing operation and made it a stunning success. Within two years, Pugh and Livingston learned enough from Herron that they no longer needed his services, but they presented him with another proposition. The stock of workhorses in the region continued to decline, prices for the animals continued to rise. Livingston and Pugh proposed that Herron break wild workhorses in the foothills to supply their business with adequate horses. Herron countered with his own proposal. He would help them reorganize and expand production in exchange for 25 percent of the increased output. In practical terms this meant that for every three horses he broke for Pugh and Livingstone, Herron would receive one horse to add to his stock. The task of breaking wild broncos proved easy for Herron, as he hitched them to a heavy coal wagon between a quiet team pulling a shipment of coal to Okotoks. Soon enough, Herron broke enough horses to set up Herron Cartage, and by 1909 the business achieved sufficient scale to contract to supply and haul coal from the mine in Black Diamond to the electric plant in Okotoks. In less than five years, Herron established for himself the reputation as an enterprising businessperson unafraid of demanding work. But his prodigious work ethic, frequent absences, and lack of social standing made him an outcast among southern Alberta elites. Dabbs suggests that this lack of acceptance bothered Herron, driving him to make enough money to force his entry into the right social circles.

One day in the spring of 1911, while waiting for a load of coal, he went to investigate a nearby gas seepage. Well known for the smell of rotten eggs, the seepage along Sheep Creek was surprisingly well investigated. As Calgary Petroleum Product drillers began their work in late 1913, "old-timers" shared stories about the seeps. The Turner family had homesteaded the valley in 1886 and used it to raise purebred horses. The brothers noticed their horses refused to drink from the water near the seepages but dismissed them as swamp gas. But cattle ranchers living on the banks of Sheep Creek dug a hole in the

ground with spade and pick through which enormous quantities of gas escaped. Through some undescribed method, they managed to store the escaping gas in barrels so they could burn it for light. John Ware, the famous Black rancher from Texas who now called Alberta home, took some samples in 1888 and sent them to a doctor in Calgary for analysis. The doctor, who pioneered the use of X-rays, proved ill-suited to analyze the sample, saying it was coal gas. The August 3, 1904, edition of *The Calgary Daily Herald* announced on the front page that prospectors searching for coal deposits on Sheep Creek had inadvertently discovered natural gas "in considerable quantities." One of the prospectors stopped to light his pipe but barely struck his match when he found himself thrown through the air and landed on the ground a few feet away hatless and with his clothes on fire. The newspaper noted that if the gas on Sheep Creek could be piped to Calgary, it might become a commercial proposition. Finally, in 1911, rancher Andy Anderson led Calgary Alderman John G. Watson to the seepage, where Watson became convinced that it produced natural gas. Hoping to attract the Canadian Pacific Railway to build their workshops in Calgary instead of Medicine Hat, on June 1, 1911, a delegation from the Calgary city council that included Mayor J.W. Mitchell and Fire Chief James Smart, staked a claim on the property for the City of Calgary. Unfortunately for the city, Mitchell and Smart never filed the paperwork, leaving the opportunity for homesteader Michael Stoos and Herron to do so a few months later in September.[18]

Herron wanted to investigate the seepages for himself. Once there, he spotted an anticline on a rock outcropping and instantly believed that petroleum produced the seepages. More than instinct prompted Herron's belief that oil existed below. His years of reading about petroleum geology had transformed Herron into a confident, self-taught amateur expert on the subject to the point where he could easily, and vividly, describe the subterranean formations of Turner Valley while explaining why it should have petroleum, as he did in an interview with the *Herald* on October 25, 1913. Herron explained that the Discovery well sat on top of an anticline that he described as a "fold in the rock, caused ages ago by pressure or contraction" that formed a natural oil reservoir closer to the surface than it would have if it were located on the largely undisturbed prairie. Describing the different layers of the earth's formation as stratas, Herron delivered a thumbnail sketch of the Turner Valley structure. "The oldest strata studied is the 'Aegean' formation, which contains no animal or vegetable fossils." Subsequent layers from the Jurassic period held the remnants of animal life in the form of lizards and reptiles, followed by the Carboniferous strata containing "a higher order of animal

Figure 1-2 "Gas and petroleum claim being staked by the City of Calgary"

L-R: Mayor John W. Mitchell; "Cappy" Smart; Alderman John "Gravity" Watson; and Frank Harris place a sign on the site of what would become Calgary Petroleum Products #1. City officials forgot to fill the necessary paperwork, enabling W.S. Herron to claim the lease instead. (Glenbow Archive CU189401)

life and luxuriant vegetation" trapped in lower shale formations. Following the coal shale and sand of the Cretaceous, were the vaunted Dakota sands. This formation, asserted Herron, "is considered to be the greatest oil-bearing formation of this district." The tremendous upheavals that produced the Rocky Mountains "have tiptilted these stratas so that now in the mountains we find the earliest stratas cropping out on the surface of the slopes." Herron explained that the ideal conditions found in the Black Diamond district existed because of the series of anticlines running parallel to the mountains. Lest anyone believe that Herron was talking out of his hat, for good measure, Herron provided the source—DeLorme D. Cairnes's report on the Moose Mountain district in "Bulletin number 968, issued by the Department of the Interior, Ottawa."[19] Stewart Herron's trip to Pennsylvania, said his son Bill decades later, "may have had a great deal to do with his recognizing the gas

seepages in Turner Valley." So, too, did his dogged determination to read and absorb the materials produced by the Geological Survey of Canada.[20]

Using a metal tub and some jars, Herron collected and sent samples of the gas to universities in Pennsylvania and California, both of which confirmed that the gas sample contained a petroleum derivative. The news spurred Herron into action. Already working eighteen-hour days, for the rest of 1911, he liquidated most of his assets, selling his farm in Okotoks and speculating in Calgary's booming real estate market. The moves provided the necessary capital, at least $40,000 ($1.1 million today, adjusted for inflation), to quietly assemble both the land and mineral rights to more than 7,000 acres of land that included the land both astride and adjacent to the gas seepages on Sheep Creek. Herron paid the Dominion land agent a five-dollar filing fee for a twenty-one-year mineral rights lease plus a first-year rental fee of twenty-five cents per acre. Thus, $165 bought a one-subsection (640 acres) lease while a quarter-section (160 acres) lease cost $45. Two of Herron's purchases along Sheep Creek, including the vital one on Michael Stoos's homestead ($18,000), and another where developers William McLeod and William Livingston ($15,000) already held the mineral rights, cost more. The purchases left Herron in possession of more than thirteen kilometres of land along the Turner Valley anticline but with no capital left for development. As historian David Breen noted, Herron's exertions left him land rich but cash poor. Breen might have added "vulnerable," because the Dominion Land Office required leaseholders to make "improvements" on the land within the first year to retain the lease. Furthermore, at twenty-five cents an acre, subsequent annual lease payments totalled $1,750, nearly double the average annual earnings of $850.92 for male workers in Calgary in 1911. While leaseholders could apply for extensions on rental fees, it was not a viable long-term strategy, particularly given Herron's extensive holdings. Herron needed to become a promoter to secure outside capital, and an experienced driller, just as other investors noticed his activities along Sheep Creek and began their own investigations.[21]

However, Herron proved ill suited to the role of oil promoter. While he was intelligent, ambitious, and optimistic about the future, promotion brought out his worst qualities—impatience, arrogance, and suspicion of others. Believing that developing the petroleum and natural gas of Turner Valley would be his ticket to becoming part of Calgary's financial and entrepreneurial elite where he would gain access to the wealth and respect he craved, he resented needing other people's money to do so. Herron, tactfully concluded oil historian Earle Gray, "was not particularly endowed with social graces." He refused to bite his tongue when the financiers overrode his understanding of geology or drilling,

demonstrating little of the confidence, grace, or tact that came effortlessly to others. Most problematic of all, and as his business records reflect, Herron proved to be litigious and held long grudges.[22]

One of Herron's first attempts to secure an outside source of funding involved approaching California oil executive Ira E. Segur. Attracted by the prospects in Turner Valley, Segur made his way to Alberta in 1911 when Herron offered him a partnership. But Segur declined the offer from Herron, partly because he believed finding oil in Turner Valley would be a massive undertaking and believed only those who could afford to lose large sums of money should invest.[23] Segur joined with E.P. Howard and promptly struck a deal with local rancher and businessperson David McDougall to form the McDougall-Segur Exploration Company in 1912.

Born in Owen Sound, Ontario, in 1845, David was the second son of Methodist missionaries George and Elizabeth McDougall, who had moved out west along the Red River cart route. The McDougall family's missionary activities cemented their prominent status. David's father, George, and brother John would eventually build Edmonton's Methodist church—the oldest surviving building in Edmonton—and worked tirelessly toward establishing schools.[24] Unlike his father and older brother, however, David had different interests that led him to receive his education at mission schools (Victoria College, Cobourg, and Rockwood Academy near Guelph) and spend a year in the United States before rejoining his family in 1865 in what was then the North-West Territories. Five years before, the family had moved to Norway House on the north end of Lake Winnipeg. Within a few years the family moved farther west to Fort Edmonton, where Reverend George established a mission. In 1867, David became a trader and a trapper with Indigenous Peoples for a 200-mile radius around Victoria (now Smoky Lake, 60 miles east of Edmonton) on the North Saskatchewan River, freighting his goods on Red River carts each spring to Hudson's Bay Company's headquarters at Fort Garry, near modern-day Winnipeg. He married Annie McKenzie in 1871, and they settled near Morley, where the couple started their family and David established himself as a missionary, merchant, and fur trader. By the turn of the century, he branched out into ranching and real estate in Edmonton and Calgary, becoming one of Calgary's leading citizens in the process. David's granddaughter Eleanor Luxton writes that David's world consisted of local leaders James Lougheed, R.B. Bennett, and Patrick Burns, among others, "who were on councils or boards, and had foresight enough to realize that Calgary had passed the 'cow town' stage . . . . When he moved to Calgary, David naturally took his place." Indeed, the sandstone McDougall School,

also known as the provincial government's southern offices on 412 7th Street SW, was named after John, George, and David McDougall.[25]

Capitalized at a meagre $100,000 divided into 100 shares, McDougall-Segur consciously appealed to well-heeled investors largely because the partners believed it made little sense for a company "to get the savings of the poor man to engage in the hazardous enterprise of drilling for oil in an absolutely new field." In short order, the company's directors sold an additional 150 shares to investors in Montreal, Toronto, Halifax, Quebec, Ottawa, Winnipeg, Edmonton, Kamloops, and Vancouver to increase the company's capitalization to $250,000. McDougall-Segur #1 started drilling on a site picked by British geologist Edward Hubert Cunningham Craig, whom they hired as a consultant, about eighteen kilometres northwest of Herron's prime location in late 1912.[26]

In the meantime, by June 1912, Herron's search for a business partner prompted him to approach the City of Calgary to provide "whatever they saw fit" to help develop the field and provide cheaper gas to displace coal for Calgary consumers. Unbeknownst to Herron, a year earlier, on June 1, 1911, Calgary mayor J.W. Mitchell and a delegation of officials staked a gas and petroleum lease on the very same parcel of land where Dingman #1 sat. City officials, however, forgot to file the paperwork in time to prevent the lease from reverting to the Crown, thus enabling Herron to acquire it that September. Frank Dabbs believes that the city's fathers, still smarting from losing the lease on Stoos's property, strung Herron along with no intention of signing a deal. Negotiations with the city continued off and on for at least four months before Herron concluded the city was not serious. Changing tack, Herron approached the Calgary Natural Gas Company's Archibald W. Dingman.

Born at Greenbush, Ontario, in March 1850, Dingman was one of nine children of United Empire Loyalist parents. As a young man, he spent some time working in the Pennsylvania oil fields from 1879 to 1883 before marrying Ida Lane in 1882. After leaving the oil fields, Dingman taught school and dabbled in several other ventures, including bicycle repair and manufacturing Comfort Soap for Pugsley, Dingman and Company. The latter venture nearly made millions for Dingman, but the entrepreneur lost everything when the factory burned to the ground. After the fire, Dingman cursed his bad luck and left for Alberta in 1902, bringing his own equipment to settle back into the petroleum industry. Like Herron, Dingman was a voracious reader of petroleum geology. But Dingman's organizational abilities and managerial acumen truly set him apart. He began his drilling career in Alberta searching for natural gas on the flats of the Saskatchewan River within the city limits of

Figure 1-3 "Archibald Wayne Dingman"

A shrewd businessman and skilled promoter, Archibald Dingman proved a steadying influence against unrealistic expectations both during and after the boom. (Glenbow Archive CU181710)

Edmonton. By 1905, Dingman moved south and launched a new joint stock venture, the Calgary Natural Gas Company, selling most of the original issue of capital stock (5,000 shares at ten dollars per share) to Calgary's elite, some of whom he would turn to again years later when launching Calgary Petroleum Products Company. Dingman found or identified several promising structures in the foothills around Calgary. With development capital in place, Dingman acted as the Calgary Natural Gas Company's general manager to secure the title of exclusive supplier of natural gas to Calgary city council. At the time, Calgary processed coal into oil to provide heat, power, and light. But burning manufactured coal gas proved inefficient and expensive for consumers, and city council looked to lower costs by switching to natural gas.[27]

At first, Dingman tried to secure his own supplies of natural gas by drilling for it in the city. In 1906, Calgary Natural Gas Company #1 spudded in at a drill site found by the Geological Survey of Canada on the Tsuut'ina First Nation. The well produced small amounts of gas but not enough to justify further development, so the company abandoned the well in 1908. Despite finding insufficient quantities of gas, Dingman still regarded it as a positive experience; the well reached a depth of 3,400 feet, a remarkable

accomplishment given the rig's limitations, and provided valuable data and experience. Dingman's next well, Calgary Natural Gas Company #2, spudded in August 1908 on the estate of Colonel James Walker in what is now the Inglewood Bird Sanctuary. Completed by May 1909, the well struck gas at 2,900 feet with a modest daily flow of roughly 900,000 cubic feet. A small pipeline linked the well to A.E. Cross's Calgary Brewing Company before additional infrastructure enabled the gas to supply a small part of the city's energy needs.[28]

Dingman needed more production, hence Herron's decision to approach Dingman about Turner Valley. But Herron simply could not match another suitor with deep pockets, Eugene Marius Coste. Born in Marseilles in 1859 to a prominent family and educated as an engineer, Eugene Coste succeeded in finding plenty of natural gas for the CPR on its western Canadian lands. From 1906 to 1909, Coste brought in gas wells all over southern Alberta before setting his sights on securing the lucrative Calgary market, especially after a prolific natural gas well blew in at Bow Island in 1911. To bring the gas to Calgary, Coste proposed building a 383-kilometre pipeline. Herron believed it would be much cheaper and efficient to develop Turner Valley because of its proximity to the city. Coste, however, denigrated the prospects in Turner Valley, claiming that the broken formation there made drilling for oil or gas pointless. The charge owed more to Coste's stake in the Bow Island pipeline project. Dingman hoped he would also receive a lucrative position in the new company, but Coste had other plans, so Dingman began quietly winding down his involvement with Calgary Natural Gas.[29] By the time Herron approached him to organize a new oil company, few others in the province could match Dingman's experience and background knowledge of all aspects of the industry.[30]

Oil patch legend claims Herron convinced Archibald Dingman and R.B. Bennett to invest their money and expertise while on a fishing trip to Sheep Creek. When the party stopped for lunch, so the story goes, Herron pulled out a pan, lit the gas seep and began cooking a lunch of eggs and bacon over the open flame. While colourful and brassy, like several stories of the early oil industry, it is a complete fabrication. Herron himself denied that the cooking demonstration happened; the Herron family maintained a reporter made it up to sell newspapers. But through sheer repetition, it became accepted truth, ensconcing itself in Alberta oil patch lore and the cultural landscape so deeply that the Canadian Western Natural Gas Company featured it in advertisements in the mid-1950s and reporters repeated it as fact into the 1980s. It endured because, as historian Brian Black observed, "the industry's success

Figure 1-4 Canadian Western Natural Gas Company Ad

The enduring myth of the alleged cooking demonstration performed by William S. Herron to attract investors to Turner Valley is highlighted by this Canadian Western Natural Gas ad from 1956. Although the Herron family long claimed that the story was invented by a bored newspaper writer, some authors continued to print the story as fact well into the 1980s.

depended on myth." Particularly myths that explain "facts about the region combined with hopes of individual wealth and the potential for petroleum to dramatically improve . . . society."[31] The story succeeds because it is unpretentious—a stunt worthy of Phineas T. Barnum that explained the presence of petroleum in Turner Valley more relatably and easily understood than reports on anticlines and geological theories. Its longevity and persistence suggest Albertans want the story to be true because of what it says about them and Alberta's oil. From this perspective, the story taps into several strands of Alberta's oil culture, including the ethos of rugged individualism, self-sufficiency, entrepreneurial initiative, faith in the power of nature to transform lives, and the romance of the "last best West" where anything was possible. Where else but Alberta could a cooking demonstration conjure a multibillion-dollar industry?[32]

Even though Coste's pipeline project provided adequate volumes of natural gas from Bow Island to the city, securing additional natural gas supplies

remained a top priority for the growing city. After all due consideration, Dingman pronounced himself satisfied with Turner Valley's encouraging indications. On July 1, 1912, Herron offered Dingman an option to purchase a 55 percent stake in 3,940 acres of land in exchange for $22,000 in cash and a commitment to spend at least $50,000 drilling a well. With an opportunity to develop a supply of gas closer to Calgary to rival Coste's Canadian Western Natural Gas, Dingman put together a nine-person consortium to create Calgary Petroleum Products Company, Limited (CPP) on July 26, 1912. Capitalized at $150,000, the company included some of Calgary's most prominent citizens: Senator James A. Lougheed, future Prime Minister Richard B. Bennett, lawyer William Henry McLaws, rancher and brewer Alfred E. Cross, and real estate promoters T.J.S. Skinner and A.J. Sayre. The large personalities in the group occasionally produced friction, but no competition would be more compelling than that between Herron and Dingman. Although Herron deserved much of the credit for envisioning Alberta's petroleum future and assembling the mineral leases, Dingman relegated Herron to the fringes of the company and became the public face of the enterprise, creating some hard feelings between the two that only intensified later. Furthermore, Dingman claimed the title of managing director despite investing no capital of his own. After establishing the CPP, Herron signed a second deal with Dingman that saw Herron buy into the company by selling four-ninths of his remaining 45 percent stake in the leases to Dingman as a "service fee" for assembling the consortium. This second agreement provided Dingman a 20 percent stake in the company and reduced Herron's share to 25 percent. Despite holding fully one-quarter of the shares in the company, Herron did not sit on the board of directors. Herron, who was sometimes difficult to work with at the best of times, later claimed Dingman neglected to notify him about the meeting formally electing the board.[33]

Notwithstanding Dingman's sharp elbows, he proved to be an inspired choice to lead the Calgary Petroleum Products Company. The *Herald* called him "the grand old man of Alberta," and Dingman's combination of business sense, experience, and temperament brought a steady hand to a pioneering venture. At the time, Dingman was among the most experienced drillers in western Canada; none of the CPP's other partners had any experience finding, processing, or transporting oil.

However valuable Dingman's practical business experience proved to be, his intangible qualities—his self-confidence, vision, faith, and level-headedness—enabled him to withstand the vicissitudes of a career in the boom and bust of the oil patch and served him well as the public face of Calgary

Petroleum Products Company. "Carry on," he would say. "We want and need more crude oil." It fell to Dingman to give updates and interviews to the press, serving as spokesperson for the syndicate, and to periodically advise various levels of government about pending oil and gas–related legislation. Mostly praised, he sometimes drew criticism from boosters for his caution and secrecy; nonetheless, Dingman remained unflappable and clear eyed, particularly at crucial junctures. Dingman thought strategically about where the company, and the Alberta oil patch, were and where they needed to go. Like a skilled chess player who sees the whole board and plots several moves ahead of their opponent, Dingman calculated the current situation and future needs before acting. The habit served him well and persisted for the rest of his life. After he died, his son, Claude, claimed his father had mapped out a twenty-year plan for the development of Alberta's petroleum industry. Dingman served as more of a steward of Alberta's natural resource wealth, in the best possible sense of the word, than a typical businessperson. Dingman's two children, Claude and daughter Corinne, vividly recalled the poem that served as their father's personal philosophy: "It's all in the State of Mind." Both seemed unaware that their father had adapted the poem from Walter D. Wintle's famous late nineteenth-century poem "Thinking," which begins "If you think you are beaten, you are" and emphasized the importance of perseverance and faith in Dingman's dogged pursuit of petroleum in the province.[34]

By November 1912, Calgary Petroleum Products Company ramped up its drilling preparations. Herron hauled the timbers and began assembling the derrick at the well site, while Dingman travelled to Pittsburgh to buy a standard cable tool rig, equipment, and a drill crew. To be sure, qualified drilling companies already existed in Alberta, including International Supply Company run by US expatriates Albert Parker ("Tiny") Phillips and Walter Randall ("Frosty") Martin. Born January 13, 1873, in Oil City, Pennsylvania, Phillips was the son of driller Samuel Anthony Phillips, who apprenticed as a blacksmith and moved into the oil industry forging tools because it offered better pay. "I was brought up around an oil rig," wrote the younger Phillips in his blue scribbler. "An oil rig was my playground."[35]

But personal rivalries and long-standing grudges also informed decisions. Martin and Phillips drilled wells for Coste and the CPR, and Dingman regarded them as bitter rivals. Instead, Dingman hired two successive drillers from Pennsylvania, William Elder and then Martin Hovis, along with an American crew, to drill Calgary Petroleum Products' first well. Personal history also took a hand. William Elder had served as driller on Dingman's

earlier wells for the Calgary Natural Gas Company. Dingman's new company spudded in Dingman #1 along the banks of Sheep Creek in January 1913, a few weeks after the spudding in of McDougal-Segur.

The site itself seemed easily accessible to major transportation links. Its location in Turner Valley meant the nearby railhead at Okotoks rested approximately sixteen miles from the well site. Flat terrain made it look easy to bring in workers and equipment. But Claude Dingman recalled that the dirt roads were either a sea of mud and water or almost impassable with drifts of snow. Torchy Anderson, later the editor of a Vancouver newspaper but in 1914 a reporter with the *Herald,* readily agreed with Dingman, vividly describing Turner Valley roads as "a doubtful adventure of mud, rocks and washouts." Fifty years later, he pointedly remarked that even on a normal day the roads were "bad beyond the imagination of today's motorists." Another reporter, Chester Bloom, added that the two chief enemies to travellers in and out of the oil field were mud and mosquitos. "Wise travellers," said Bloom, "never went anywhere in those wilds without sharp axes" to cut down trees when necessary to build "corduroy" sections of roadway across water and mudholes. Even then, teams of horses proved more practical than automobiles to haul supplies and equipment to the well site.[36]

Once drilling started, the combination of a particularly harsh winter, the depth of the well, the limitations of cable tool rig drilling technology, and scant knowledge of the difficult geology of the Turner Valley formation proved frustrating for even the most experienced American roughnecks. William Elder, and later Marty Hovis, quickly learned that the field was unlike any other they had drilled before. Known in driller's parlance as "crooked hole country," the soft rock, folds, and twists in the formations below dictated caution; otherwise, drill tools would bend, get stuck, require repair or, if lost down the hole, could compel the abandonment of the well altogether. Decades later, Dingman's nephew Charles, who served as the province's chief geologist, realized most wells in Turner Valley were crooked; after a few hundred feet of drilling, the hole would slant off in another direction. Holes purportedly 5,000 feet deep were far shallower than drillers realized because the drill bit began travelling parallel to its intended target as it skidded across the top of the limestone formation. Only in the 1930s would equipment capable of measuring a well's deviation arrive in the province, and in one case horrified drillers learned their wells deviated as much as thirty degrees from perpendicular. *The Western Oil Examiner* later powerfully described the effect as producing holes "that went down like corkscrews and meandered all over the sub-surface of the Valley." As a result, wells in Turner Valley, already

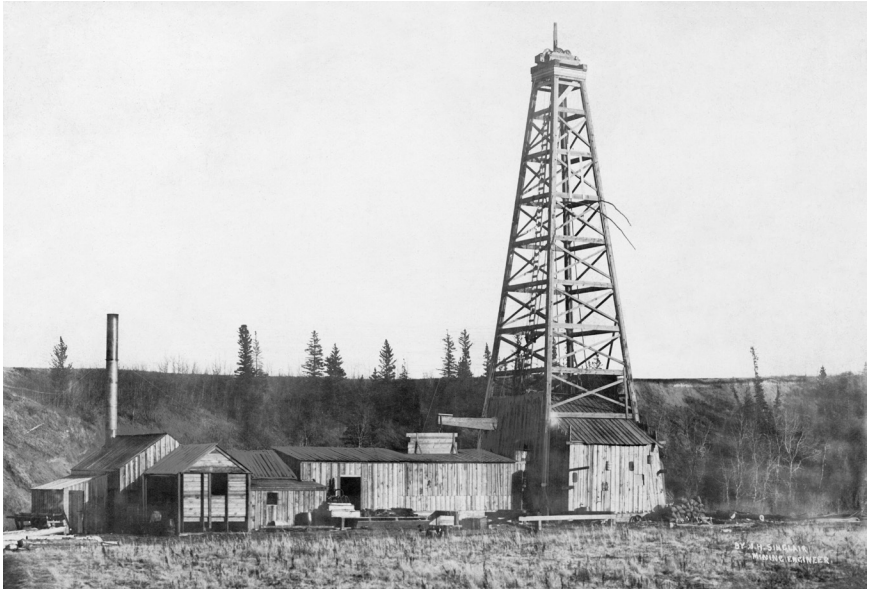

Figure 1-5 "Calgary Petroleum Products #1 well [Dingman #1], Turner Valley, Alberta"
Drilling on the Dingman well started in July 1912 and a few problems and challenges made it deeper and more expensive for the Pennsylvania crew to drill. Turner Valley was "crooked hole country" and it took more than 650 days and more than $60,000 ($1.8 million today) to drill 780 metres (2,718 feet.) (Glenbow Archive CU1217652)

deeper and more expensive to drill than those at other locations and requiring a well depth of over 3,000 feet, could play cruel tricks. The average drilling cost of $12.50–$13.00 per foot did not include the $27,000 worth of machinery bought by Calgary Petroleum Products Company, straining both the budget and the limits of cable rig technology. As Carl Nickle observed, in 1914 drilling beyond 3,000 feet with cable tool technology went beyond reason because of costs but also because of Turner Valley's unpredictable geology.[37]

In the early twentieth century, whether crews were drilling for oil in Texas or Turner Valley, the process was slow, monotonous, and dangerous. Cable tool rig technology used a wooden derrick, usually constructed on-site from hand-cut planks of Douglas fir, and a steam engine to operate like a primitive jackhammer. Working in four- or five-man crews, skilled rig builders normally took six days to complete construction of a cable tool rig, along with the bull wheel, derrick, and machinery housing.[38] Made of tempered steel, the sharp and heavy drill bit, sometimes starting out at twenty-four inches in

Figure 1-6 "Drillers at Dingman #1 well (Calgary Petroleum Products #1), Turner Valley, Alberta"

Apart from overalls, leather boots, and gloves, drillers in the early twentieth century lacked any personal protective equipment. Note the soft hats. Calgary Petroleum Products' drillers Joseph Brown (right) and Martin Hovis (third from right). (Glenbow Archive CU1134522)

diameter and weighing as much as a ton, grew progressively smaller in size and weight as wells went deeper. Suspended from a Manila cable and attached to the end of a steam-powered "walking beam" that rocked like a teeter-totter, the heavy drill bit rose to the top of the 84-foot-high derrick before crashing into the rock below. Periodically, the driller removed the bit to clean the hole of rock chips. When the bit dulled, the tool dresser heated and reshaped the point with a ten-pound sledgehammer. While rotary rig technology existed, it was faster, bigger, more expensive, and required more skilled workers to run. More importantly, early drillers deemed rotary rig technology unsuited to the unpredictable subsurface features of Turner Valley.

Most camps usually had a car available for "the convenience of the camp," to get to the nearest post office or telephone, but when wintry weather arrived, the car was useless. Water had to be drained from the radiator in the fall to prevent it from cracking in freezing temperatures. Health and safety regulations were decades away and few rules governed oil exploration in the early days—only the regulations governing the use of steam engines applied because of the rig's use of a boiler to power the rig. As historian David Breen noted, basic guidelines governed the extraction of minerals. "The essential

requirement was that one had to obtain the consent of the mineral rights holder, then one might dig, burrow, blast and drill at will."[39] By 1910, federal regulations dictated that the Canadian Navy (then known as the Naval Service of Canada) could make first claim on oil production from Crown lands, pre-emptively establishing a quasi-form of nationalization that superseded the law of capture, which held that oil production belonged to those who brought it to the surface.[40]

Although the petroleum industry in North America had fifty years of experience by the 1910s, oilfield technology remained in its infancy and regulation and health and safety measures were spartan. After discovery, provisions to protect the environment and guard against waste were very basic. Few early drillers bothered using casing pipe, so if drilling went through a shallow aquifer a well could spoil the groundwater. Furthermore, drillers had little to no control over gas; if the bit struck a pocket of high-pressure gas, it could easily cause a blowout. Indeed, one early well drilled at Pelican Rapids along the Athabasca River in 1897 hit a flow of natural gas estimated at 8.5 million cubic feet per day. As the drillers lacked the capacity to adequately deal with the blowout, the well continued to spew natural gas for the next twenty-one years before it could be shut in.[41] If a well struck oil, metal or wooden tanks stored production; if production exceeded storage capacity, drillers relied on shallow pits to store the excess. Earthen trenches were far from ideal; crude could leak out of them, and since they were usually uncovered, the lighter (and more valuable) fractions, like kerosene, tended to evaporate. Nevertheless, a combination of economics, the primitive state of petroleum engineering, and self-interest meant the well would produce flat out regardless of the consequences. No incentive existed to steward resource development; in fact, several factors argued against showing any sign of restraint. Investment capital and profits could only be realized by selling production. In fact, companies that shut in (left oil in the ground after drilling) production for any length of time were uncertain the well would resume production at its former level. The lack of trained petroleum engineers meant producers risked having the well collapse on itself or become clogged with paraffin.[42]

Beyond well site considerations, no equipment existed, for example, to protect the rig or crew if the drill hit a pocket of high-pressure gas and caused a blowout. Even basic personal protection equipment for rig hands, like steel-toed boots and hard hats, did not exist. Unless down for repairs, rigs operated twenty-four hours a day, seven days a week with two crews, each working a twelve-hour shift and sleeping and drinking in makeshift shacks while off duty because there was nowhere else to go. The shortage of

skilled or experienced roughnecks and rig hands meant high wages for those who were around. With an average hourly wage of thirty-five cents an hour in Alberta, drillers earned more in one month (approximately $880) than farmhands or apprentices earned in a year—prompting some to inflate their credentials. "The Americans were expert liars about their qualifications when they showed up in Canada," noted the wife of driller Garrett W. Green, who in 1914 was employed by International Supply Company to drill a well near Viking, Alberta. "Findlay (Ohio) roustabouts [workers who completed whatever heavy work was required] suddenly became firemen; firemen back there could get jobs as tool dressers and tool dressers could easily pass for drillers here."[43] Rig hands earned between twenty-five and fifty-eight cents per hour ($3 to $7 per day), depending on their position and experience, but for most of the single men, the bulk of their pay went to alcohol. "Few outsiders could understand the psychology of oilfield crews and their capacity for whisky," wrote oil patch historian John Schmidt. "They could always depend on working hard the next tour to sweat it out of them."[44]

Spouses, partners, and children of rig workers endured the same dreary and solitary conditions at the drill camps. Living quarters consisted of tarpaper shacks or tents. Given the relative isolation of drill sites, uncertain roads, and lack of transportation, women stayed close to the camp. Livery stable hands from the nearest town usually delivered groceries once a week. When the monthly pay envelope arrived, the women in camp would try to get to Edmonton or Calgary for some shopping, visits with friends, and catching up on the latest news and gossip. "We had variety in this kind of life," recalled Mrs. Green. "From rattlesnakes in the Bow Island country, to the beautifully wooded foothill country; and we loved it all. Early Alberta was a wonderful place for children. There was so much for them to do outdoors." While the snakes often scared the children, the most prevalent pests were mosquitos. "They came out of every pothole," recalled Mrs. Green, "and the only known repellent we knew then was oil of citronella. It was bought by the gallon for the camp." At the Dingman well, from time to time, members of the Stoney Nakoda Nation would pass through, taking parts of the animals that the settlers did not use and trading food for rose petals and wolf willow beads.[45]

Unintentionally, the early Alberta oil patch imposed a spartan hand-to-mouth existence on investors and drill crews. Equipment and replacement parts took days to arrive by train from Pennsylvania and were subject to a 37 percent import duty, straining budgets and patience even further. Companies and drillers became accustomed to scrounging and borrowing material help from anyone who could provide it. Compared to a well in Pennsylvania,

where production costs were between $2,000 and $3,000 a well, wells in Turner Valley field were nearly ten times as expensive to drill, costing $30,000 to $35,000 (all figures in 1914 dollars). According to Dingman, the added expenses all had to do with the Turner Valley formation, which required more casing per well and the use of casing deeper down the hole to prevent cave-ins, which slowed drilling and increased costs.[46] At most, the crew could only drill a few feet per day. All too frequently, the rig sat idle as the crew waited for casing, pipe, tools, or parts to arrive by rail. At other times, drilling stopped because the company lacked sufficient funds to pay for supplies, equipment, or wages. Unsurprisingly, given this experience, fifteen years later Herron reminded a separate set of partners grumbling about slow progress and rising costs that they all knew some wells in Turner Valley that took between one and seven years to drill approximately 3,500 feet underground.[47]

From early on, Dingman #1 gave promising signs of being a natural gas producer. At 180 feet, it produced enough gas to replace coal as the energy source for the well's boiler. Other pockets of gas appeared at several horizons (467, 877, 1,205, 1,235, and 1,260 feet). The promising developments prompted visits to Alberta by Standard Oil representatives in March 1913. By August 1913, with the well producing two million cubic feet of gas at a depth of 1,563 feet, Dingman began selling gas to communities around Calgary via a hastily constructed pipeline. In addition, Dingman and the CPP collected and hauled some of the naphtha in tank wagons and drums for sale in Calgary. But Dingman wanted oil, so the search continued. Knowing that people and the press scrutinized every word, Dingman remained cautious in public statements. A public letter published both in the *Morning Albertan* and the *Herald* in May tried to scuttle early rumours of an oil discovery. "The facts are," wrote Dingman, "that the district is not yet a determined oil field and is not yet even a gas field of determined commercial value." Another press conference in early August 1913 illustrates Dingman's deft ability to manage expectations while sustaining optimism. As he did before, Dingman corrected reporters suggesting CPP had developed an oil field, preferring to use the less prosaic term "prospect" instead. Until a field produced oil, he repeated, it was just a field. The presence of so much high-quality naphtha suspended in the gas reminded Dingman of the oil produced in Pennsylvania, and Dingman hoped that its source was oil-based. But, referring to the amount of casing required, Dingman allowed that, compared to Pennsylvania, the Turner Valley field certainly "did not stand up well" to drilling. Still, Dingman confided to reporters, finding the source intrigued him, as did the lingering question whether it existed in commercial quantities. Dingman allowed that pungent

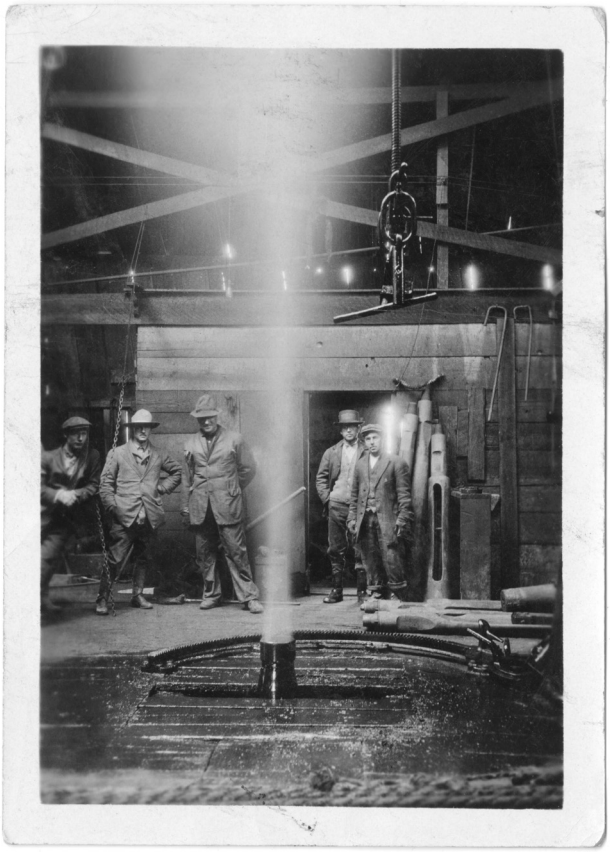

Figure 1-7 "Group of men standing at well-head of Dingman #1 (Calgary Petroleum Products #1), Turner Valley, Alberta"

Interior of the Dingman well drill shack showing the crew watching the well venting, most likely petroleum condensate. Mostly transparent and nearly odourless, condensate is more flammable and explosive than crude oil. Usually composed of propane, butane, or hexane, the rest of the sentence should read condensate can also contain carbon dioxide, hydrogen sulphide, aromatics, and naphthenes. (Glenbow Archive CU1134205)

question to linger in the air for a moment. Just as easily, Dingman dismissed ever-present rumours that Standard Oil would take over the field. "Standard Oil have the money to buy the oil if they want it," Dingman said matter-of-factly, "but the idea that they are following prospectors and promoters around is ridiculous."[48]

The other major company drilling in Turner Valley, McDougall-Segur Exploration, spudded in their first well before Calgary Petroleum Products Company. Their experience revealed several early growing pains with the Alberta oil patch as the new industry took shape. Some problems in the oil business are universal and happen regardless of where operations take place—like a lost tool in the well that delays drilling or delinquent shareholders not responding quickly enough to a cash call. Other problems are the product of an incomplete regulatory environment in a new industry, as when

McDougall-Segur discovered in October 1913 that the owner of the surface rights, Francis Wright, could assert the right to bar them from accessing their first well site. Despite McDougall-Segur possessing the mineral rights, and the fact that drilling had begun ten months earlier, the Dominion's existing Petroleum and Natural Gas Regulations did not entitle the company to enter upon leased lands without the permission of the surface rights holder. Belatedly, the board of directors mobilized to lobby government to pass amended legislation and engaged in protracted negotiations with Wright to ensure the company could access the well site. Thankfully, for the company's sake, at no time did Wright block their access and the two sides reached an agreement in May 1914 granting them access in exchange for $500 and two shares of McDougall-Segur stock. Negotiation and, in time, new legislation resolved these and other similar issues.[49]

As the depth of the Dingman well rose and the volumes of gas continued to increase, the higher costs and longer time required to drill Turner Valley brought structural and institutional changes to address the needs of oil companies and Albertans alike. Both Calgary Petroleum Products and McDougall-Segur began drilling as privately owned enterprises with comparatively modest expectations about operational costs, although both would ultimately become joint-stock companies. CPP committed to spend $50,000 drilling Dingman #1—$1.5 million today, adjusted for inflation—while McDougall-Segur increased their initial budget of $100,000 to $250,000 (approximately $6.6 million, adjusted for inflation.)[50]

Questions about the best way to mitigate risk while still financing exploration loomed over the emerging industry, especially as companies contemplated raising investment capital. Unfortunately, many Canadians doggedly clung to the belief that British investors remained eager to invest in Canadian resource schemes regardless of their size and scale. As London merchant banker Arthur Grenfell wrote to his father-in-law, Earl Grey, the Governor General of Canada, in 1907, "There is no doubt that most Canadians think that they have only to arrive in London with ideas and everyone is prepared to fill their pockets with sovereigns." As the country was only a marginal petroleum producer, Canadian oil companies operating domestically received scant attention from British investors. From 1890 to 1914, British direct investment in Canadian oil never exceeded $5 million, with most of that investment capital funnelled toward Ontario-based exploration companies. The problem for Canadian natural resource projects was that they competed against other opportunities for long-term British investors who enjoyed global investment opportunities. Only the largest, and few proven, producers tended to secure

British capital. However, the size and scale of operations in Turner Valley might warrant the creation of a local exchange prevalent in periodic mining booms—coal in Nova Scotia, nickel and iron ore around Lake Superior, various gold and silver discoveries in Ontario, British Columbia, and the Northwest. According to historian Ranald Michie, all adhered to a rough pattern where the initial rush of discovery witnessed the proliferation of numerous joint-stock companies that justified the creation of a local exchange.[51]

In early August 1913, 200 men gathered outside the Dominion Land Office to try and file on several oil leases. The crowd grew impatient and soon a fight broke out that quickly escalated, requiring the police reserves to restore order. In an increasingly tense atmosphere, three members of the Calgary Petroleum Products board—Sayre, Dingman, and Lowry—recommended to the Calgary Board of Trade (the precursor to the Calgary Chamber of Commerce) that it help form a local stock exchange. Their reasoning was sound. At that time, no organized capital market for resource development existed in western Canada. Railroads spent their own money developing coal mines to fuel their trains. Forestry and other mining projects could count on attracting investors using private capital to finance their endeavours. Borrowing from the banks remained limited. Apart from granting mortgages to farmers, banks in western Canada were ill suited to finance development projects with long investment horizons. In any case, only a handful of banks operated nationwide and small private banks proliferated across western Canada.

Much like those in the United States or the United Kingdom. Alberta's progressives tended to buttress Adam Smith's conception of the market's self-regulating invisible hand with the belief that a freely chosen act was, by definition, a "natural" and moral one as well. Historian Daniel Rodgers notes that the notion of a freely chosen act and this potent combination "stacked that burden massively against state economic action." Instead, members of the emerging professional and middle classes created voluntary associations that not only rationalized their professions but enabled them to exercise political and economic power in the process.[52]

Given the tight margins and highly speculative nature of petroleum development, creating an exchange to raise long-term risk capital seemed prudent. Augmenting their numbers by including other prominent Calgary businesspeople, an eight-person consortium petitioned the provincial government to incorporate the Calgary Stock Exchange as part of an attempt to put into place ideas of self-regulation and governance that travelled hand in glove with idealized notions of laissez-faire capitalism. In the case of the

Calgary Stock Exchange, "the need was felt," reflected R.F. Scrimgeour, the CSE's secretary-treasurer in the 1940s, "for a trading centre where members of a well-regulated and strictly disciplined organization might gather for the purpose of not only of trading in securities in a free and open market but of promoting the best interests of an infant industry." Lacking either the financial resources or the ideological inclination to assume responsibility for regulating the industry, the provincial government found it "expedient to grant their prayer," and issued the CSE a provisional charter on October 25, 1913. The Act incorporating the CSE required it to "compile records and publish statistics, to acquire and distribute information respecting stock, shares, bonds, and debentures . . . to promote the observance of such regulations and requirements as may be by by-law established." Like several stock exchanges that emerged in the western United States and Canada before it, the Calgary Stock Exchange played a key role in securing investment capital for the oil and gas companies operating in the local economy—just not yet. The CSE did not begin operations for the next seven months mostly because, while a dozen or so companies formed and began selling stock, the volume of those trades did not yet justify opening the exchange.[53]

Advocates for the CSE were right to be cautious. The chances of success were minimal; approximately 10 percent of the companies created in the initial rush produced any mined product, be it ore, gold, silver, or oil. Even fewer companies, around 4 percent, turned a profit and paid dividends. Companies typically sought well-heeled British or American investors, but most of the start-up capital for mining ventures was usually both local in origin and highly speculative, meaning that it tended to withdraw as quickly as it appeared, making the firm's long-term prospects extremely tenuous.[54]

Meanwhile, section 40 of the January 18, 1914, federal regulations governing resource extraction addressed concerns about the growing presence of US capital in the Canadian industry. The Dominion government stipulated that companies operating on Crown leases "shall at all times be and remain a British company, registered in Great Britain or Canada and having its principal place of business within His Majesty's Dominions and the chairman and majority of the board shall at all times be British subjects and the company shall not at any time be or become directly or indirectly controlled by foreigners or by a foreign corporation."[55]

Nonetheless, the more fluid and open borders of the early twentieth century meant American prospectors, promoters, and investors regularly operated in Canada and eagerly joined the rush after putting a few locals on their board of directors to follow the letter of the law. This certainly was the case

in Turner Valley. As historian Ranald Michie points out, "American prospectors, promoters, and investors regarded Canada as an extension of their own hinterland."[56] Americans found several ways around the legislation, particularly as federal laws did not prohibit US citizens from holding mineral leases on Crown lands, and US entrepreneurs already living in Canada used a combination of their own capital and locally raised funds to gain entry. Appointing local agents, lawyers, and managers to a company's board of directors also addressed stipulations that British subjects comprise a majority of directors for any company operating on Crown lands.[57]

Alberta-chartered companies also actively encouraged the participation of US investors if for no other reason than their omnipresence in the West generally, and in Calgary in particular. The 1911 census revealed that Americans made up approximately 10 percent of Calgary's population of 44,000. However, as historian James Gray argued, the census likely undercounted the number of Americans in Calgary and Alberta, categorizing people according to racial background. Since many Americans were of British ancestry, census takers included them among Calgary's 29,000 British citizens rather than the 4,000 Americans. Plenty of signs pointed to the ubiquitous presence of Americans in Calgary beyond the ambiguous results of the census. The most exclusive residential area in Calgary, Mount Royal, became known as "American Hill." Twenty-four American fraternal societies operated in Calgary by 1908; twenty-five labour union locals affiliated with the American Federation of Labor. Thirty Protestant churches tended to the spiritual uplift of the city, mostly Baptists and Methodists that supported the Temperance and Moral Reform League.[58]

On October 6, 1913, William Elder returned to Calgary from Turner Valley to tell Dingman that, at 1,562 feet, the well produced a few gallons of straw-coloured liquid popularly known as "white oil." Technically, however, the liquid was naphtha, a petroleum condensate usually found in conjunction with crude oil. Although the directors of Calgary Petroleum Products hoped to keep the discovery secret, word already had begun to spread. Calgary Petroleum Products issued a cover story that Elder arrived in the city to secure a spare piece of equipment to repair a break in the machinery. Rumours of an oil strike grew in frequency and intensity, prompting the *Herald* to note on October 9 that "it's very difficult to get at facts in the oil business, and this paper therefore takes no responsibility for the truth or untruth of the report." Indeed, as the *Albertan* observed, rumours of oil strikes floated from Turner Valley every two or three weeks for the previous six months had kept Calgarians in a high state of alert. The *Edmonton Journal* speculated

that Calgary Petroleum Products were reluctant to confirm the find until they secured more acreage. Finally, on October 10, 1913, Dingman issued a very carefully worded statement to the press to temper expectations and provide perspective. He acknowledged that Dingman #1 had struck "oil of a very high specific gravity . . . and the quality is equal, if it does not exceed, the finest grades of oil found in any oil territory." However, Dingman warned that the discovery "does not prove or determine that commercial values maintain." More work, money, and time were necessary to prove whether the well would produce enough to sustain industrial development of any scale. "Until this is determined," Dingman stated flatly, "the physical conditions are such that all exploitations must be purely speculative." Dingman reminded reporters that, so far, Dingman #1 had produced mostly gas with traces of oil. Until proven otherwise, it would be safer to assume that the oil was an anomaly, although Dingman maintained it was an encouraging one. Dingman wanted reporters to keep this information in perspective and treated with a healthy dose of caution. In the meantime, Calgary Petroleum Products would continue to drill, "encouraged to hope that it will be able to secure results which will bring about an evolution in our industrial welfare."[59]

Despite Dingman's qualifications and circumspection, many heard only what they wanted, and enthusiasm continued to build. Press coverage of the discovery further complicated matters by using the terms "natural gas," "gasoline," and "oil" interchangeably. Like pilgrims travelling to a shrine, a procession of Calgarians travelled by automobile to Okotoks to see the "Discovery Well" for themselves. Included in the caravan were two of Calgary Petroleum Product's directors, A.J. Sayre and Oscar G. Devenish. Once at the site, they emptied their tanks and drove back to Calgary using the naphtha from the well to demonstrate the quality of the unrefined product. The *Herald* reported that the men were amazed to discover that "the power generated was at least 25 percent greater than that obtained from the gasoline on sale in the city." Observers also noted the heavy sulphur content of the naphtha as the fuel burned. Although it may have been a corny—and foul-smelling—stunt, it proved effective with many who saw it, and Calgary Petroleum Products soon equipped a car with a sign telling people it was powered by gasoline provided directly from the Dingman well. Even though reports indicated a small flow of naphtha and not crude oil in commercial quantities, boosters, promoters, and reporters soon posited that the field contained an oilfield "second to none on the American continent." A stream of reports claimed that the oil was the highest grade ever recorded—pure gasoline without refining. Gallons of oil were handed out in small bottles and the *Herald* reported that more than

twenty different companies formed to sell stock based on their leaseholds in the region.[60]

From his room in the Empress Hotel, on Sunday, October 12, 1913, Archibald Dingman set aside some of his earlier reserve and qualifications in announcing that the company had found oil "in commercial quantities," but pointedly refused to provide details as to how much or how little, in gallons or barrels, Dingman #1 had produced. "I have never seen, nor have I ever heard of oil of a similar grade or quality, so far as excellency is concerned, except in what is known as the Cherry Run district of the Pennsylvania Oil Fields." Following his formal statement, Dingman entertained reporters' questions, and revealed some ambivalence regarding developments over the previous forty-eight hours. The director of Calgary Petroleum Products recognized he was in a tight spot. If he emphasized the speculative nature of developments and the risk CPP's investors had taken, he might discourage others from drilling in the field. But If he abandoned his restrain and celebrated the discovery too much, "I might reap, ultimately, recrimination," said Dingman, if other companies drilled without the same success. As he did so frequently, Dingman kept a level head and urged people to temper their enthusiasm. It was impossible to tell how thick or thin any oil-bearing strata were, and he provided an example of a well at Pincher Creek that had demonstrated all kinds of promise but was ultimately a dry well because the broken formation below allowed the oil to seep away. Notwithstanding Dingman's careful qualifications, the October 13 edition of the *Albertan* carried a banner headline: "Oil is found in commercial quantities" even though the evidence did not yet support this conclusion.[61]

By October 16, retailers in Calgary bought a barrel for $9.30 ($246.68, adjusted for inflation) and sold gasoline from the Dingman well for thirty cents a gallon. The *Albertan* stated that Calgary had captured the attention of "the big oil world" and reported on the growing outside interest. "California, and Oklahoma and Texas and Pennsylvania have accepted the new field as worthy of consideration and from many of the oil centres of the United States and Mexico are coming experts and operators." The activity coincided with another visit to Alberta by British geologist Edward Hubert Cunningham Craig, this time serving as a consultant for a syndicate of London capitalists put together by Winnipeg financier Mowbray S. Berkeley.[62] Craig marvelled that "to the best of my knowledge oil, similar to that coming from the Dingman, in its crude form has never before been discovered. It is unique, and if I told experts in the old country that automobiles could be run on crude oil from a well in southern Alberta, I am sure that they would not believe me." The

oil produced at the Dingman well was too high in quality to fuel the Royal Navy, declared Craig. But as the well bored deeper to find the source of crude, Craig was certain it would be of a lower calibre more appropriate for naval use. Even though Craig was not involved with Calgary Petroleum Products, he believed that the Dingman discovery "is entirely in accordance with the theory formed and published in my book on the subject of oil-finding."[63]

The Dingman discovery touched off a scramble among promoters to secure mineral rights, and since the Crown held most of the mineral rights within the province (some estimates place the number at 95 percent), this produced a rush to the Dominion Land Office to file petroleum leases. In one day, speculators filed 118 separate applications covering 100,000 acres within a fifty-mile radius of the Dingman well. Several leases changed hands, with one allegedly fetching $33,000. However, those holding the mineral rights on property near Dingman and the McDougall-Segur wells refused to sell for the time being and reportedly were monitoring developments. Speculators filed on so much land that in short order, the only available promising parcels would be leases returned to the market after their leaseholders fell behind on their payments. The competition was so intense for these properties that one local company stationed four men at the land office twenty-four hours a day. "They are filing as far away as Lethbridge," noted one land office official. "If this keeps up, claims will soon be taken down near Coutts and right down south as far as the international border." By the end of the year, the Calgary land office collected $85,000 from leaseholders and the Dominion government received $1.445 million in lease payments for 1913–14. Early in the new year, when expiring mineral leases taken out twelve months earlier returned to circulation because the owners had failed to develop the lease, ugly scenes ensued at the land office, forcing Calgary police to station officers and institute a lottery to draw for places in line to avoid "disgraceful riots." Over two days in October 1913, police oversaw the distribution of 750 lottery tickets for a place in line. On the following Saturday morning, the number of lottery tickets doubled to 1,500 just for the opportunity to bid on land between fifty and sixty miles away from the Dingman strike.[64]

The boom drew new people, workers, investors, and fortune hunters to the city. As early as June 1913, prospectors and oil workers arrived from the major producing regions and finance centres of the United States seeking new opportunities. By sheer serendipity, the Dingman discovery coincided with one of the periodic declines in drilling activity in the United States. Between 1910 and 1913, US petroleum industry drilling increased to 23,094 wells, a 66 percent increase. Drilling activity declined sharply thereafter, dropping to

12,142 wells by 1915. Most of the decline took place in the aging and maturing fields from Lima, Ohio, to Appalachia, prompting an exodus of oil workers from Ohio, Pennsylvania, West Virginia, and Illinois westward in search of new opportunities as the US industry's centre of gravity moved south and west. While Oklahoma, Texas, and Louisiana were frequent destinations for itinerant oil field workers, some made their way to Alberta. In June 1913, *The Oil and Gas Journal* reported that "'Billy' Davidson, an old-time temper-screw artist [driller], left Tulsa this week for Calgary, one of the booming cities of the Canadian Northwest" after hearing reports about the discovery. Upon arrival in Alberta, Davidson conducted his own investigation and was now determined to lease or buy land in the province. If the land refused to produce oil, Davidson figured he would rent it to an ambitious farmer to raise wheat.[65] Other US expatriates, like International Supply Company's Frosty Martin and Tiny Phillips, did not think of coming to western Canada until they were hired by geologist Eugene Coste to drill for oil and gas on the prairies. Head drillers of the Dingman well, Martin L. Hovis and Joe Brown, arrived from Pennsylvania.[66]

Others left the city to drum up investment capital, like local entrepreneur and real estate promoter Clarence A. Owens. Weeks before, Owens had authored a series in *The Morning Albertan* informing Calgarians about the tricks of the trade for real estate "wildcatting" he learned and profited from during the recent housing boom in Calgary. In the petroleum industry, "wildcatting" means drilling for oil in territory not known to be an oilfield. But, in Calgary's real estate market during the boom years before 1913, "wildcatting" referred to misrepresenting the true value of property in anticipation of selling that asset to another investor for a larger profit. Seeing a new opportunity, Owens quickly left for New York, allegedly with samples from the Dingman well, to secure funding for a new petroleum venture. A few weeks later, Owens returned triumphantly, proclaiming the trip a remarkable success because he had found wealthy American investors to launch a new company, Canadian Standard Oil. *The Morning Albertan* reported the company had $5 million worth of operating capital provided by unidentified but "well known oil men of New York" with pre-existing operations in Oklahoma and California. Owens and his new-found partners pledged to buy land, develop, and operate in Calgary.[67]

The assumptions made by Albertans about the boom are quite striking. Many, if not most, were certain that a very large oilfield waiting to be exploited lay just outside of Calgary; some even predicted that it extended as far north as Fort McMurray and as far south as the international boundary. They

were equally sure that oil would be easily found in commercial quantities and that they sat on the cusp of the economic opportunity of a lifetime—one that could secure their financial future. Beyond these oft-expressed beliefs, other assumptions reveal few thought carefully, if at all, about the logistics or infrastructure necessary to exploit an oil boom. While exploration companies formed to start drilling for oil and investors dreamed of geysers of oil gushing from the ground, few asked, "What next?" or "What else do we need?"

Calgary and Alberta were not adequately prepared for the appearance of a major oil field. The city lacked storage facilities, transportation, and refining capacity, meaning these capital-intensive facilities would have to be built. Further downstream, more questions remained. What market would Alberta oil service? Perhaps more importantly, would Alberta oil be competitive on international markets? There were already reasons to suspect it might not be, as wells in Alberta and Turner Valley were already among the deepest drilled using cable tool technology, raising questions about the effect this would have on production costs even before transportation costs to markets were included. The sheer distance of the oil field to major urban markets or tidewater either in Canada or the United States raised questions about Alberta oil's ability to displace other crudes from the market, especially given the high sulphur content of petroleum produced in the valley. Nevertheless, many took it on faith that, if oil were found, the city and the province would embark on a new development trajectory and potential bottlenecks would wash away. Boosters claimed railroads would expand their transportation infrastructure to service the oil fields. Additional capital projects would produce investments in extraction plants and refineries, producing new jobs and industries on the prairies. This is what happened in Texas in January 1901 when Spindletop came in with production of 75,000 barrels per day. But Texas oil fields were so prolific that they broke John D. Rockefeller's monopoly over the US oil industry and temporarily drove crude prices to three cents a barrel.[68]

Surely, boosters believed, Calgary was destined to become the next great North American petroleum centre. And heaven help the person who questioned it.