Imperial Oil REVIEW
AUGUST, 1951

WESTERN OIL REACHES ONTARIO
A New Source of Strength

This issue of the Review records a notable chapter in the story of oil in Canada. The delivery of Alberta crude to Ontario is having profound effects on Canada's oil economy. Some of those effects have been immediate; some of them will be felt gradually as the years go by. The following pages discuss them in detail.

One effect has been evident for some time now on the prairies: while inflationary forces were pushing up prices of almost every other commodity, basic petroleum prices held steady or fell. As a result of western petroleum developments, oil prices have been substantially reduced in the three prairie provinces with savings for one-fifth of Canada's population.

Prairie price changes have followed a pattern that has been taking shape ever since Leduc. Regional price reductions came step by step, as the development grew. A widespread reduction was made last October when Alberta crude reached Regina through the Interprovincial pipe line which lowered transportation costs to prairie refineries. Another reduction came in April this year in all parts of the prairies when Alberta producers reduced their wellhead prices to compete with imported crude in Ontario.

Recently, as a result of opening of the new Winnipeg refinery, Imperial reduced the wholesale price of its gaso-line through the large part of Manitoba and in parts of northwestern Ontario. At Winnipeg the reduction was two cents per gallon and this, with the earlier reductions, made the wholesale price in the Manitoba capital 5.2 cents lower than last October.

Factors such as increases in taxation and in freight rates have tended to raise oil prices this year. Like other commodities, oil has been affected by general conditions. The downward revision of oil prices on the prairies has not been accompanied by reductions elsewhere in Canada. Instead, some increases have been necessary, both regionally and across the country.

Prairie oil prices have reflected some of those fluctuations. But the upward trend has been more than offset by increased production, economical transportation, and the entry into the Ontario markets. Prairie oil bills have been cut some $55 millions below what they would have been had the western development not taken place. For one-fifth of the country's population this has meant a price reduction of between five and six cents per gallon.

The prairie area requires large quantities of oil for the operation of tractors and other equipment on the farms, for heating homes, for the functioning of industries, for transportation and for other activities. Because of lower prices, the energy which oil represents can be used even more widely, stimulating the further growth of the prairie economy. In this, and many other ways, the western oil development is giving new strength to the nation.

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**On the front cover:**

Our front cover shows the Imperial Leduc on the big new Power feeder was rolling into Santa Fe with the first cargo of Alberta crude. This occasion marked the start of regular delivery of western oil to Ontario. Now joined by her sister ship, the Imperial Redesdale, and other tankers, the Imperial Leduc is in steady service on the Great Lakes and each trip means that more oil is being transported to be processed for use by Canadians.
Marking a great change in Canada's petroleum economy, Premier Leslie Frost turns the valve in a ceremony at Sarnia as

WESTERN OIL REACHES ONTARIO

Sailing across the broad waters of Lake Superior, through the Sault lock, the busy St. Mary's River, and into Lake Huron, a procession of tankers now is in constant service carrying Alberta oil to Ontario. The delivery has settled into a quiet, steady routine that already is an everyday part of the heavy ship traffic on Canada's great inland waterway.

But on April 24th when the Imperial Leda docked at Sarnia for the first time with her first cargo of western crude she was greeted with ceremony and excitement. Whistles, crowds, bands and flags welcomed the big new ship and speakers stressed the importance of the developments which started Alberta oil coursing eastward through the 1,136-mile Interprovincial pipe line and then, aboard tankers, a further 662 miles across the Great Lakes.

"This event... marks the beginning of a new phase in the progress of our country," said Premier Leslie M. Frost of Ontario. "It means that Canada is more self-sustaining."

In addition to Ontario's premier, speakers on the program marking the occasion included Canada's deputy minister of trade and commerce, W. F. Bull; Hon. G. E. Taylor, representing the Alberta provincial government; G. W. Axier, president of the Western Canada Petroleum Association; and G. L. Stewart, president of Imperial Oil. Dr. J. L. Huggett, general superintendent of Sarnia refinery, was chairman and among the guests on the platform was George Tosh, a driller who was a member of the crew that brought in the historic Imperial Leda No. 1 well on February 19th, 1947.

Hours before the official ceremony started, watchers lined the shore at Point Edward north of Sarnia where the Blue Water Bridge spans the St. Clair River.

The schedule for the day read: "At 9:30 a.m. April 24th the tanker Imperial Leda, carrying Alberta oil, will pass under the Blue Water Bridge at Sarnia. She will berth at the new wharf below the refinery at 10:30..."

Out of the Lake Huron fog she came, paint fresh and flags flying, and her whistle gave three long and three short blasts to answer greetings from the shore. At 9:30 exactly, by the wheelhouse chronometer, her bow passed beneath the high span of the Blue Water bridge. An hour later she was alongside the wharf near the tanks and towers and stills of Sarnia refinery.

Hundreds of Sarnia citizens together with officials of local, provincial and federal governments attended the deckside ceremony. The towers and tanks of Sarnia refinery provided a fitting background for it was near here that Canada's oil industry was born about a hundred years ago. From small beginnings the refinery grew to be the largest in the British Commonwealth.

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Once docked, and while the crew were connecting the oil discharge lines, the big tanker soon was swarming with visitors. Photographers' flash bulbs blinked, newswires cameras turned, television and radio men recorded the event and reporters buttonholed Capt. T. K. Russell Knight for facts about his ship.

From the tanker the visitors moved to the wharf where a platform had been built and at 3 p.m. the official welcoming ceremony began.

In the principal address, Premier Frost said:

"With the arrival here today of the world's largest freshwater tanker, the Imperial Leduc, we are witnessing the fulfillment of an undertaking which was begun only four years ago on the plains of Alberta, 20 miles southwest of Edmonton. The discovery of crude oil near the little town of Leduc in February, 1947—just four years ago—marks the beginning of one of the most important events in Canadian history.

"This remarkable and important discovery...has made Alberta one of the wealthy, if not the wealthiest province in Canada.

"The strength of Canada is in the even development of our country. The prosperity of all is dependent upon the prosperity as a whole. May all of our sister provinces, from British Columbia to Newfoundland and Nova Scotia have developments in their natural resources and in industry which will rival what has been done in Alberta."

Premier Frost (left) and G. L. Stewart, Empire's president, greet the Imperial Leduc's Captain T. K. Russell Knight as the big new ship completes its first voyage.

One of the big discharge lines used to take the cargo of Alberta crude oil from the Imperial Leduc and send it into Sarnia storage tanks is being prepared for hook-up by refinery and tanker men.

The Premier described the new wealth brought to Canada by the rapid growth of the crude oil industry and the savings in foreign exchange made possible by the oil development. He pointed out that about one third of Canadian crude oil requirements this year will be met from western Canada.

Earlier, Mr. Bull had referred to the past played by Imperial in the western oil activities, adding the wish that the "Captains, officers and crews of the good ship Imperial Leduc and her sister ships may enjoy many long years of smooth sailing. They and their ships are vital parts of the chain of transportation that is now bringing the new wealth of our west to the rapidly expanding markets of the east."

Representing the western oil producers, Mr. Auxier said: "Had the Interprovincial pipe line and the Imperial Leduc and its sister ships not been constructed, our market area would have been limited to the prairie provinces, for the cost of transportation would not permit us to compete in the area served by this and other Ontario refineries. Our production would have continued on a restricted basis and the incentive to continued exploration would have been lost."

Mr. Auxier noted that the delivery to Sarnia brings much closer the time when Canada's oil production may equal her consumption, "a matter of some importance to a nation which stands second among all nations in the per capita consumption of petroleum products."

He pointed out that to displace foreign oil in Ontario, Alberta producers will have to take a lower price than if prairie markets only were to be supplied.

"However, we trust and expect that any reduction in the field price of western oil that we are obliged to take in order to compete at this point will be offset by our increased production," Mr. Auxier said. "We will not have the satisfaction of knowing that more Canadians are being supplied with Canadian oil."

In his address Mr. Stewart pointed out that Sarnia now has a secure and substantial source of Canadian oil supply, and the transport facilities—pipe line and tankers—are efficient and economical. The pipe line, ships, tankage and docks "are products of the planning and labor of thousands of workers and already they represent an investment of more than $100 millions. We expect that the investment will be added to as time goes on."

Mr. Stewart emphasized that it should not be expected that the western movement will result in lower prices for oil products in Ontario.

"To provide oil for this market the Alberta producers are accepting prices lower than those paid to their counterparts in other great producing areas, such as Texas and Venezuela," he said. "As a result prairie refiners are getting crude oil at lower cost and the benefits are being passed on to prairie consumers.

"But the oil lays down here at a price competitive with the foreign supplies it is displacing," he continued. "Naturally the Alberta producers would not take a reduction greater than was necessary to give them access to this market and naturally the Ontario refiner could not pay, in the face of competition, a price for Alberta crude higher than prices he is currently paying for crude from other sources. Accordingly so far as Sarnia refinery is concerned, there is no change in its crude oil costs or product prices because of this movement."

In conclusion Mr. Stewart said: "The whole Canadian economy will benefit by the stimulation of industry, by exchange savings and by other generating effects of the development. Indeed these have already been felt by secondary industries in eastern Canada. Construction of the line and tankers has resulted in large purchases of materials and supplies and has contributed substantially to employment in Ontario and elsewhere. Further benefits will accrue as time passes and the economy is further strengthened by the expanded use of our natural resources."

The climax of the ceremony came when Premier Frost turned the valve which sent the Imperial Leduc's crude oil surging into the shore tank at the refinery.

And now the Imperial Leduc and her sister ship, the Imperial Redwater, are sailing regularly between Superior, Wisconsin, and Sarnia. Also joining in this movement are the tankers Imperial Windsor, Imperial Cornwall, Imperial Sarnia and the chartered ship Makanui. The deliveries will continue until ice halts navigation next fall but before then it is expected the tankers will have transported about 10.7 million barrels of crude that will become oil products for use in Ontario. The distance barrier which kept Alberta oil within the prairies has been broken.

The 620-foot Imperial Leduc, largest tanker to sail the Great Lakes, has just passed under the Blue Water Bridge on its maiden voyage to Sarnia carrying the first cargo of Alberta crude for Ontario refinery ports. Factory whistles greeted her arrival.
The delivery of western oil to Ontario was greeted as an event of national importance. Increased provincial revenues from royalties, rentals and sale of mineral rights.

Reduced provincial debt—Largely because of the revenues from oil, Alberta has been able to reduce its public debt by $56 millions, saving large amounts in interest. Grants have been made to municipalities which will permit a reduction of up to six mills in local tax rates.

Increased public services—The province has been able to undertake a large-scale program of road-improvement, increased facilities for schools and hospitals, and other measures from which every citizen will benefit.

Growth of population; development of industries—Alberta’s population of 886,000 (as of June, last year) is now the largest of the three prairie provinces. For many years Saskatchewan has led the largest population but was overtaken by Alberta in 1949; the Saskatchewan figure is 874,000 (as of June 1950). Industry in general is flourishing in Alberta and last year 19 new manufacturing industries were established involving capital expenditures on buildings and machinery amounting to $175 millions. During the year, 705 new Alberta companies and 167 foreign companies registered in the province.

The prosperity of individuals—Landowners who own mineral rights, others who obtain revenues from surface rentals and business men in the towns near the oil fields all have increased incomes from the development. Mineral rights on much of the land in Alberta belong to the province and it is the policy of the government to spend the revenues from oil on projects that will be of general benefit. Every citizen in Alberta, accordingly, is benefiting directly from the oil development.

The encouragement for further search—Perhaps the most important single result of the Canadian oil development—only the future will tell—is the stimulus it has given to the continued search for new reserves. The large amounts of oil that have been discovered give reason to believe that still greater quantities lie hidden waiting to be found. With the goal of providing enough oil for all of Canada’s needs, money, manpower and materials are being poured into Alberta, Manitoba, Saskatchewan and British Columbia in the greatest oil exploration effort in the country’s history. If the search is successful, the benefits to Canada will be multiplied many times over.

What Western Oil Means to all Canadians

A new major Canadian industry—We have a great oil producing industry now that is of national and international importance. (The fields that existed before Ledue could supply only the local areas in which they were situated.) The new oil producing industry gives employment, pays taxes, and is growing steadily. As an indication of the growth, it is approaching the nickel and gold industries in importance of production.

A sure and substantial source of supply in Canada—Our dependence on overseas sources of oil has been lessened. Canada now is supplying one-third of her oil requirements from within the country. Imports will no longer be necessary for the prairie provinces and a large part of Ontario will use Canadian oil.

Increased power and energy—The new fields have added to the prime sources of energy in the world. They will help to maintain and improve our standards of living in Canada.

A greater degree of national security—We are sure of essential oil supplies in peace and in war. Canada’s oilfields strengthen North America’s position because they can provide a large part of this country’s oil needs even if war or economic changes should disrupt ocean shipping to an extent that would stop normal imports of crude from other continents.

A huge increase in the money invested in oil—Investments by the oil industry in Canada since Ledue have totaled almost a billion dollars. As a result Canada now has great new oil producing fields, new and enlarged refineries, new ships, an extensive pipeline system and other improved facilities.

New jobs, new industries, more business—The investments in oil have contributed to the general prosperity of recent years because money from the oil industry has found its way into the pockets of Canadians outside the prairies.

The general benefits—

The people of eastern Canada, Ontario and British Columbia are sharing in the general benefits listed above. As examples, eastern factories are manufacturing a substantial amount of the equipment required for refinery expansion and for the interprovincial pipe line. Ontario shipyards built the two new tankers to carry Alberta oil across the Great Lakes.

All-Canadian oil products for Ontario—Consumers in a large part of the province now can use oil products made from Canadian crude and not from imported oil. It was an achievement to bring Alberta crude to Ontario and to do so at the Alberta oil producers reduced their wellhead prices to compete with U.S. suppliers who are nearer to the Ontario market. The price in the Alberta fields is now the prices that the oil brings in Ontario less the cost of transportation.

The general benefits—

as listed above for all Canadians—the economy of the three prairie provinces has been strengthened.

Self-sufficiency in oil—The new fields plus increased refining capacity in the west now make the prairie provinces independent of foreign oils for their energy requirements. Prairie refinery capacity was increased by 120 per cent from 1946 to last year and by the end of this year capacity is expected to reach 146,000 barrels per day bringing the increase to 185 per cent. This has been a strong stimulus for the expansion of all kinds of industry in the west.

Lower prices for oil products—If the Alberta discoveries had not been made, prairie consumers would have had to pay up to 10 cents more per gallon for their gasoline. Without the oil finds, prices for oil products would have had to be substantially increased, just like those for other commodities in this inflationary period. But oil prices in the west have remained relatively low. Even before Alberta crude moved to Ontario, price reductions were made which saved the consumers millions of dollars. The movement to Ontario has brought another reduction throughout the prairies. The overall savings on the prairies are estimated at $30 millions in 1949 and $55 millions last year; and it is expected they will be $65 millions this year. For every man, woman and child in the three provinces this is a saving of $1.95 in 1949; $13.94 in 1950; and $21.91 this year.

The general benefits—

as listed above—Again, Alberta naturally was the first province to become self-sufficient in oil and benefit from price changes.

Increased provincial revenues—Since Ledue the province’s budget is receiving over $75 millions from royalties, rentals and sale of mineral rights.
The cradle of Canada's petroleum industry is in Lambton County, Ontario, where this drilling rig struck oil nearly 100 years ago.

Half a Billion Years, A Century of Search and Leduc were among

The Stepping Stones To Sarnia

As the throbbing pumps of the big lake tankers lift their cargoes of Alberta crude ashore at Sarnia this year, there can be some widely varying estimates of how long it took to get the oil to Ontario.

— It took half a billion years, the geologists will say, because it's that long since the oil was laid down in the earth's crust.

— Almost a hundred years, according to some oil historians, referring to the century of the search for oil in Canada.

— It all started four years ago with the Leduc oil discovery in 1947, many Canadians will maintain.

— The turning point came less than three years ago, oil economists will probably contend. That's when enough petroleum reserves had been found in Alberta, following the 1948 find at Redwater, to make the west self-sufficient in oil and permit exports to other areas.

And the construction people will base their estimates on the time it took to build the Interprovincial pipe line across the prairies and to finish the big new lake tankers, projects that began in 1949.

— Finally, the simple definition will be given that the oil could travel from the Redwater field to Sarnia in 28 days; that is, 26 days going through the pipe line and two days crossing the Great Lakes (no allowance for stop-overs in storage tanks.)

Each of these estimates is from a different viewpoint and each is true. The arrival of the first Alberta crude for the refineries and markets of Ontario is a great Canadian achievement to which many things and many people contributed. There were a series of events that can be considered the stepping stones to delivery.

Oil was found in substantial quantities in the west only after decades of search and disappointment.

Since Leduc hundreds of millions of dollars have been spent; new discoveries have been made; refineries have been built and existing plants expanded to take care of the needs of the prairies; pipe lines have been laid to gather the crude and carry it over a thousand miles to the Great Lakes; giant storage tanks have been erected; large tankers have been launched and put into service; and now the delivery to Ontario has begun. In four years of intensive work and planning, Canada's oil economy has been changed.

Back of it all, of course, is the bounty of Nature herself who, half a billion years ago, created the oil in the west. Organic matter from ancient seas that once covered the west became buried far under ground where it was subjected to tremendous pressures and heat and turned to petroleum.

The oil remained underground for eons of time waiting for the evolution of man, for the passage of human history, for the discovery and settlement of North America. Man eventually learned that petroleum can be an invaluable servant but western Canada's oil was extremely difficult to find, hidden in scattered structures, a half-a-mile to a mile below the prairies.

The search for oil in this country started a hundred years ago, not in the west but in Ontario near Sarnia. The first drilling was in Lambton county and the first commercial production of petroleum began there in 1857. The town names of Petrolia and Oil Springs commemorate this early activity.

Sarnia refinery was established because of the Ontario oil. At first the plant obtained supplies by horse-drawn tank wagons from the nearby oil fields. For a time the Ontario crude was adequate for the needs of the area until new petroleum uses pushed the demand far ahead of the local supply. Canada was entering the automobile age and more and more crude was needed.
As a result, Surinia refinery, which grew to be the largest in the British Commonwealth, had to obtain the bulk of its supplies from foreign fields. The Ontario wells have continued to produce and over the years 50 million barrels of oil have been recovered from the area. But this supply has been more than 10 per cent. of their oil needs from Canadian fields.

Now, in 1961, oil from western Canada, added to the small and steadily growing flow from Ontario, has enabled Surinia refinery to change to large-scale use of Canadian crude.

After the early discoveries in Ontario, many attempts were made to find oil in other parts of the country. In western Canada the first results of the search came in 1914, in Turner Valley, near Calgary. Although the first Turner Valley well produced 50,000 barrels of oil, the find was an incentive for oil searchers through long years of search and disappointment.

In 1924 Turner Valley again attracted attention when the first well brought in a wet gas well, and established a new field. Niagarc, a new form of gasoline, was discovered in the area. Then, in 1938, crude was obtained on the west flank of the gas field and the Valley became a major oil-producing area.

Earlier, in 1939, oil had been found at Norman Wells in the Northwest Territories. Only 90 miles from the Arctic Circle, the small Norman Wells field was developed during World War II and today serves the growing northern communities, but it is too remote to be of importance to most populous areas.

The Turner Valley and Norman Wells developments were encouraging, but hundreds of wildcat wells were sunk throughout the west but for many years the results were not on any large scale.

Turner Valley was able to supply refineries in Calgary and in some other western centres. It is a medium-sized field in terms of the world’s production and its peak was reached in 1942 with a daily average flow of 26,000 barrels.

Through all this period Canada had to bring in most of its crude requirements from abroad. Oil from the United States, South America, and eventually from the Middle East, moved into the country by tanker ship and pipe line. After World War II, Turner Valley production began to decline and more and more imported oil was required, even in the west. By 1949 Canadians were obtaining less than 10 per cent. of their oil needs from Canadian fields.

Over the years many millions of dollars were spent in exploration. Name after name joined the long list of dry holes: Muskie, Stolberg, Brazee, Coalper, Hillsborough, Provoet, and many others. At Muskie drilling was carried on for 550 days and the cost was $1.6 million.

Imperial Oil drilled 133 unsuccessful wells. But still the hard partisans, the seismic group and the gravitymeters and magnetometer crews continued the search. And on February 13, 1947, at Imperial Leduc No. 1 a driller’s voice, high-pitched with excitement, sang out, “She’s coming in!”

Leduc, only 16 miles from Edmonton, was the reward for years of faith, the discovery well of a field that has been proved up to 250 million barrels of new oil reserves.

The discovery of Leduc sparked a four-year period of fast changing events leading directly to the recent start of delivery of oil to Ontario. Leduc showed that major oil pools could be found under the plains. Men and money were hurrying to find them. Edmonton became an obvious site for a new refinery. Under ordinary circumstances it would have taken three years to build, but Imperial purchased the equipment of a closed plant at Whitemouth, transported it 1,520 miles, and re-assembled it. As a result the Edmonton refinery was in operation in 17 months after Leduc’s first well came in.

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Turner Valley, discovered in 1914 near the foothills of the Rocky Mountains, is still a good producing field but on a declining scale.

Many other measures were adopted to speed up the development. Railway tank cars were diverted to carry Leduc crude to Regina refinery which had been dependent on oil from Montana, the mid-continent and other United States fields. Western oil began to fill the full needs of areas after area on the prairie. By the end of 1948 Alberta was changing to an oil-surplus area ready to take care of some of the needs of its sister provinces.

Meanwhile the motives were many. The discovery of the Redwater field northeast of Edmonton in the summer of 1948 was a decisive event. As the possibilities of the area became known, it was established that the field was bigger than Leduc and that western Canada was on the verge of self-sufficiency in oil.

The next goal was to find enough oil to take care of some of the needs of the west of Canada. Alberta became the second most actively prospected oil area in North America, surpassed only by Texas. More than 100 oil companies joined the hunt.

Great as had been the growth of the industry in the two years following Leduc, 1949 produced more activity, greater growth. In the one year $100 millions were spent on exploration and development. Golden Spike, Excaliber, Stettler, Normanville and other discoveries were made.

For the first time there were prospects of a surplus of supply beyond the needs of the prairies. The oil was pushing out from the west and the questions were: who could best use it, and how could economical transportation be provided.
Plans had already been discussed for a pipe line from Edmonton to Regina. Should that line be continued farther east or should a line be built west?

To the west the Rocky Mountains presented a barrier that would make pipe line construction very costly.

To the east were the prairies which offered an easier path for the mechanized equipment the pipe line builders use and to the east, too, were prairie refining centres that could use pipe line transportation. Beyond them was the large market supplied by refineries at Sarnia and near Toronto where western crude would be welcome as quickly as it became available at an economic cost.

The decision was made: Alberta’s oil would go east.

Last year was a year of building. The pipe line streaked its way across the prairies; such projects as the new $10 million Winnipeg refinery started construction. Further discoveries proved that, in far less time than the most optimistic had hoped, not only had enough oil been found for prairie needs but also enough for a third of Canada’s requirements. Before Leduc, prairie oil reserves were estimated at 44 million barrels; today they are placed at the one billion, two hundred million mark.

Through all of 1950 the production of the western fields had to be held down to the needs of prairie refineries until the new outlets were provided. Alberta’s oil was “bustin’ at its seams.”

From the Redwater field to the Great Lakes port of Superior, Wisconsin, the shortest route, is a distance of 1,126 miles. In a great engineering effort the pipe line was laid in 150 days, record time for such a project. Oil from Alberta reached the Great Lakes before the end of the year.

The line cost $90 millions and was built by a newly formed company, the Interprovincial Pipe Line Co. Many factories and industries across Canada provided supplies for the undertaking.

Capacity of the pipe line is 85,000 barrels a day on the Edmonton-Regina section and 70,000 barrels a day on the Regina-Superior section. On its course the pipe line serves the needs of refineries at Moose Jaw, Regina, Brandon and—through a branch line from Grotta—Winnipeg.

Along the line are pumping stations at Edmonton, Kerrobert, Regina, Crook, Grotta and Clearbrook. They pump the oil up to a pressure of nearly 1,000 lbs. per square inch and send it along the line at two miles an hour.

At Superior storage tanks were built where over a million and a half barrels of crude can accumulate during the winter while navigation is closed on the Great Lakes. Some of these tanks began to fill last December waiting for the delivery to Sarnia.

Last link in the transportation chain is the tanker fleet required for the delivery across the Lakes. New ships were needed, big fast ships.

At Collingwood and Port Arthur keels were laid for the two largest freshwater tankers in the world, the Imperial Leda and the Imperial Redwater. Each ship was designed to carry 116,000 barrels; to load at Superior, unload at Sarnia and return to Superior in five days. Their pumps will discharge 15,000 barrels an hour to shore terminals.

By November last year the large tankers were almost and they spent the winter months being fitted. Meanwhile at Sarnia the big refinery prepared its reception for the Alberta crude. To berth the giant tankers, a new concrete dock was built costing half a million dollars. Twenty new storage tanks—each 150 feet in diameter and 48 feet in height—began to take shape. When all of them have been completed they will be able to store three million barrels at one time. Three miles of 20-inch pipe were laid to move the crude from dock to tankage and in the tankage area another mile of 16-inch pipe was put down.

In the refinery laboratory exhaustive tests were conducted on the Redwater crude. The refinery equipment was made ready to process the new oil into the full range of over 750 petroleum products made at Sarnia.

As spring began to come this year all these activities of so many people in so many parts of Canada awaited their culmination. The large tankers were completed and passed their trials. The oil had travelled through the pipe line and was at Superior, the refinery was ready for its reception at Sarnia.

The last stepping stone to delivery had been reached.

On April 21st the Imperial Leda picked up its first cargo and sailed out into Lake Superior. On its two-day trip the large tanker travelled east through the big inland sea to Whitefish Bay, entered the St. Mary’s River and the Sault Canal, reached Lake Huron through Detour Passage, steamed down the approximate centre of the lake, south to Point Edward. With a few more kicks of her propeller, the tanker proceeded down the St. Clair River under the Blue Water Bridge and the docks of Sarnia were ahead.

The long journey which, the geologists say, began half a billion years ago, was over.

And now Alberta crude is reaching Sarnia in a steady stream, opening up a new era for Canada’s fastest growing industrial centre. This year about 11 million barrels of crude are expected to be delivered to Sarnia refinery from the west. The oil will be processed for use in the heavily populated agricultural and industrial areas of western and central Ontario.

Each tanker that makes fast to the wharf in Sarnia’s port with a fresh cargo of crude from the west means that more of Canada’s oil will be made ready for use by Canadians. Because of the great developments in Alberta the petroleum that was hidden below the prairies for hundreds of millions of years now is serving Canadians living thousands of miles apart.
NO ONE INDIVIDUAL, no single group of people, can be said to have been solely responsible for the development of western Canada's oil.

The development is unlike some great accomplishments that are always linked with one man or one woman. The settlement of the Red River Valley is coupled with the name of Lord Selkirk; Ontario's hydro system with Sir Adam Beck; South Africa's diamond industry with Cecil Rhodes. But western Canada's oil did not have a Selkirk, a Beck, or a Rhodes.

Instead, many Canadians engaged in many occupations took part in the events that have led to self-sufficiency in oil for the prairies and the delivery of western crude to Ontario.

Imperial Oil as a company pioneered the great western Canada oil discoveries. But Imperial wasn't alone. From time to time in the long years before Leduc many organizations engaged in the search. As soon as the Leduc find became established in 1947, scores of other companies joined in the intensified hunt for oil and the expansion that followed.

With Imperial, again, it cannot be said that any one individual or any single group is responsible, alone, for the role the Company has played in the west. Rather, many groups worked together to make a dream come true.

These groups included the shareholders who, by their investments, backed the Company's enterprises; the management, responsible for planning and direction; the searchers, who carried out the wide surveys in the west; the leasing experts, who arranged for the right to drill; the drillers, who found the oil; the production men who organized production in the new fields; the pipeline and ship builders who provided economical transportation for the crude; the refinery specialists, in charge of manufacture; and the salesmen who are distributing the products of western oil on the prairies and in Ontario.

Long before Imperial discovered Leduc, exploratory parties employed by the Company roamed the western plains and foothills looking for signs that might indicate the presence of oil. Often working in distant, almost inaccessible areas, travelling by truck or pack horse, sometimes by canoe, the geologists and surveyors studied the land formations and looked for rock outcrops while the seismographers and other specialists tried to determine by their scientific instruments the nature of the underground structures.

All the findings of the exploration were correlated by a central staff who studied the rock samples and other data. Then, if an area looked sufficiently promising, arrangements were made to drill, because only by drilling can the presence of oil be proved.

A decision to drill a well brings into focus another group of people—the lease men, who arrange for rights with the property owners, the rig builders and finally the drilling crew members.

The men of a drilling crew each have names related to the various jobs involved in rigging up the derrick, lowering pipe and drilling sometimes as deep as two miles into the earth. There is the driller; the derrick man; the pipe racker; the cathead man who operates the ropes used for snubbing, lifting and other purposes; the lead tong man in charge of the tongs or great wrenches that tighten or loosen the drill stem; and the boiler man. Collectively all of them are known as "roughnecks" and the men who do the odd jobs in an oil field are known as "rountabouts". Over the drilling crew is the "tool pusher" who may be in charge of several wells and must see that supplies and equipment always are at hand.

In the decades before Leduc, Imperial's exploration parties and drilling crews, like those of other companies, met little but disappointment. But the knowledge gained in the widespread search and by drilling 133 dry holes, led to the Leduc discovery on that cold February afternoon back in 1947.

As soon as oil begins to come from a new field the production crews take over. Under the direction of a field superintendent, bull gangs and roughnecks dig ditches; a network of underground pipes is laid; batteries for production are installed; connection gangs join the pipes and valves; essential equipment is placed in operation. Field engineers have the big responsibility of seeing that the oil is produced as efficiently and economically as possible.

Meanwhile the transportation experts are deciding the best way to get the oil to the refineries: whether by tank truck, railway tank car or by pipe line.

The Leduc discovery set in motion a chain reaction of events within the Company. The Company's management immediately assumed new responsibilities. Large scale planning and financing had to be undertaken to develop the find and to increase Imperial's refinery capacity in the west. Company assets were consolidated by such moves as the sale of Imperial's $80 million interest in International Petroleum Ltd., and money was poured into the west to provide the men, materials and equipment needed.

As the drillers brought in well after well at Leduc, as the production people organized the field so that Leduc crude began to flow to prairie refineries, the exploration parties and other drilling crews continued their search elsewhere in Alberta.

The need for a refinery at Edmonton brought into action another group of oil specialists. After Imperial had purchased the disused Whitehorse refinery, truckers moved the equipment, piece by piece, down the Alaska highway to be re-assembled at Edmonton.

The construction job involved the work of engineers, mechanics, carpenters, blacksmiths, boilermakers, draughtsmen, pipe fitters, riggers, process operators and many others. Then when the big plant went on stream, the operators took charge of the great equipment in which the oil is refined; all the varied experts and other workers needed to run a refinery were assembled, including engineers, process control men, chemists and an efficient clerical staff.
secretaries, stenographers, bookkeepers and accountants, to handle the paper work.

Meanwhile the increased exploration had resulted in the discovery of the Redwater field and other finds. As each new field came in the sequence of events was like that which had taken place at Leduc: the first find, the drilling of additional wells, the organization of production, the construction of gathering lines, the delivery to the refineries. 

At first Leduc’s oil was delivered by railway tank car and by tank truck. Then the pipeline builders went to work and soon crude from the Leduc field was sent underground from nearby Nisku to Edmonton.

In this period the railroads did a big job in distributing oil from the new fields to the prairie refining centres. But as more and more oil was found, construction of a major pipe line from Redwater to the Great Lakes became justified.

Imperial sponsored the $90 million project in its initial stages but from the beginning it was obvious that a separate company should be formed to undertake the big job. Thus the Interprovincial Pipe Line Co. in which Imperial now holds a minority interest came into existence.

Construction of the line involved a huge task of financing, of obtaining steel and other materials and of physical work. Aerial and surface surveyors blocked out the route working through the worst prairie winter in years. The purchasing departments toiled overtime to secure supplies; operators moved in with big tractors, ‘side-boom cutters’ and mechanical ditch diggers; the 1,126 miles of plains and streams and rivers and marshland were divided into these construction areas in each of which work proceeded at one and the same time, as the welders joined section after section of pipe.

Approximately 1,500 people were employed in building the pipe line. Storage tanks were erected, pumping stations took shape, and in December last year the line was in operation.

Meanwhile Imperial marine architects had drawn up the designs for the two new lake-tankers—the ‘Imperial Leduc’ and the ‘Imperial Redwater’—and the Company placed the orders for construction. All the assorted skills of the shipyard people at Collingwood and Port Arthur were employed as the big ships were built, launched and made ready for trial runs.

When the tankers were ready to sail they were staffed by Imperial crews. Captains, officers, engineers, electricians, cooks, deckhands and stewards, oilers and flemish and messboys all went aboard to undertake their roles in helping to deliver Alberta crude to Ontario.

And now the delivery is an accomplished fact.

The people at Sarnia refinery now are processing Alberta crude into hundreds of different products that will be delivered to bulk plants and other marketing centres in Ontario. Imperial’s marketing department had shared in the western development already, not only through the division of products on the prairies, but because the overall operations of the department provided much of the money that financed the Company’s western expansion.

In fact, it can be said that all Imperial employees in all parts of Canada have helped in varying degrees to shape the developments in the west.

Imperial and the other oil companies have created a great petroleum producing industry in Canada that did not exist before. This has been the achievement of no single individual, of no single group, nor of a single company, but is the result of the efforts of a large number of Canadians, all of whom have shared in what has taken place.
They delivered the goods

At Hamilton, Ont., 1,196 carloads of steel plate were rolled in this mill to fill an order for the Interprovincial Pipe Line Co.

Men in Factories Across Canada Helped the Rapid Development of Western Oil

In the scorching glow of a steel rolling mill, in the glare of a shipyard welder’s arc, under fluorescent lights in city factories and gasoline lamps in construction shacks, many thousands of men have worked in the past four years on a series of seemingly unrelated jobs, all of which have helped to shape the growth of Canada’s oil industry.

Made-in-Canada materials and equipment, produced by a variety of industries, greatly assisted in the delivery of Alberta oil to Ontario.

When an oil field is born, when a great pipe line is to be constructed, when giant tankers are to be built, a multitude of materials must be provided. The discovery of Leduc intensified the hunt for essential supplies and now each of the oil companies operating in Canada has its own story of the use of Canadian-made equipment.

Imperial Oil’s purchases last year indicate the wide scope of Canadian manufacture. For its major operations in exploration, production, transportation, refining and marketing, the Company in 1950 bought from over 6,000 Canadian firms, a list that reads like an index of Canada’s industry.

Much of the specialized exploration and production equipment still must be imported from the United States. But more and more of the products used by the oil industry are being made in Canada.

The 16-inch pipe required for the Interprovincial pipe line is an example. For the first time steel pipe of a diameter larger than 12 inches was mass-produced in Canada. Page-Hersey Tubes Ltd., undertook the job, making 335 miles of the 16-inch size. This was the largest pipe order ever placed in Canada and it speeded up Page-Hersey’s decision to erect a new steel pipe mill at Welland, Ontario, costing $5 millions and employing 400 men.

There are many other examples of the way in which the unlocking of Alberta’s oil resources encouraged Canadian firms to make materials that formerly had to be imported. The huge investments in the oil development, approaching a billion dollars since Leduc, have helped to stimulate the expansion of Canada’s industry.

All the buying for Imperial and its wholly-owned subsidiaries is directed by the Company’s general purchasing department headed by B.G. Kitchen.
Mr. Kitchen states that all of Imperial's purchases are guided by the general policy that whenever possible the company buys materials or equipment in the area where they will be used, provided of course that prices are not uneconomical. This is an effort to distribute company spending in communities across Canada. If the necessary supplies cannot be obtained locally, attempts are made to get them from Canadian manufacturers elsewhere. Purchases from outside Canada are made only when the supplies either are not available here or cannot be bought at a reasonably competitive price. For some urgent needs, of course, time of delivery is all important and purchases are made on that basis.

**Building the Pipe Line**

These policies also determined the purchases for the construction of the big pipe line from Redwater to the Great Lakes. It will be recalled that Imperial sponsored the pipe line project in its early stages although the company now holds only a minority interest in the new Interprovincial Pipe Line Co. From the beginning Mr. Kitchen and his department had the responsibility of maintaining the smooth flow of supplies without which the underground system could not have been built to the Lakes in record-breaking time.

Products of Canadian manufacture have helped not only in building the pipe line, but also in almost all the phases of the western development. In the decades of search before the Leduc discovery, supplies made in Canada aided the explorers for oil. The equipment for the pack horse parties, canoes, snowshoes, tarp and rig covers were among the essentials that came from Canadian factories.

As the search continues, these supplies are being provided in increasing quantities. Most of the scientific instruments used by the survey parties, the seismograph and magnetometer crews and by other exploration specialists, have had to be imported from the U.S. However at least one Canadian company has been organized to service magnetometer units. The derricks and drilling bits, too, are specialized equipment often of patented design and manufactured in the United States. Most of the bits used in Canada are made in Houston, Texas, by the Reed Roller Bit Co., or by the Hughes Tool Co.—the company with which Howard Hughes of aero-plane and movie fame is associated. The chemicals for the mud fluid used in drilling also are imported.

The drill pipe, casing and most of the tubing needed in a well come from the U.S. or Britain. But Page-Harvey now is manufacturing some of the tubing and many miles of steel cable are being turned out by Canadian manufacturers to help drilling.

The drilling of wells in new areas often involves big road-building projects and every field that comes in requires new or improved roads for easy access.

Because of the oil activities, the road builders have been at work in many parts of Alberta using explosives and materials from Canadian sources.

As soon as the Leduc and other fields began to develop there was a great increase in the materials provided by Canadian firms for the oil industry. Tanks, separators, small pipe for the field gathering lines, engines, speed increasers, miles of fencing, great quantities of cement and many other necessities of producing fields came from Canadian suppliers in great quantities. In some cases the Christmas tree itself, the symbol of production, is Canadian-made. The tree is an arrangement of valves and pipe fittings which control an oil well and its major parts are manufactured in this country.

As the crude starts its 1,326 mile journey to Lake Superior examples of Canadian-manufactured products are plentiful. Many of the pumps that propel the oil through the gathering lines in a field are now made in Toronto by the John Inglis Co. Ltd. Much of the pipe in the Interprovincial pipe line was made by Page-Harvey as described above. To make the pipe, the largest order for steel plate ever placed with a Canadian mill went to the Steel Co. of Canada and 1,105 car-loads of the plate moved out from Hamilton.

While Page-Harvey manufactured all of the 16-inch pipe in the line, the A. O. Smith Corp. of Milwaukee supplied over 400 miles of 20-inch pipe.

**Wrapping for the Pipe**

Before the steel pipe was placed in the earth it was given a coating of special tar enamel, and the sizable quantities needed brought Roppers Co. Inc., of Pittsburgh, Pa., into this country. A subsidiary was established at Port Arthur, known as By-product Coke Co., of Canada Ltd.

Part of the pipe's protection is a glass pipe wrap. Here, too, the need was answered by Canadian workers, with Fiberglas Canada Ltd. installing the necessary facilities at Oshawa.

The list grew with the manufacture, for the first time in Canada, of eight-cylinder diesel engines specially designed for pipe line service. This was undertaken by Dominion Engineering Co. Ltd., Lachine, Que.

Then chalk up another “first” for Canada Iron Foundries Ltd., Three Rivers, which began making the Byron Jackson design of high pressure centrifugal pumps.

Pipe lines must be equipped with valves of special design. Here the pioneer was Guelph Engineering Co. Ltd., which made special pipe line gate valves under an arrangement with Kerotak Valve Manufacturing Co., Pittsburgh, Pa.

The job of building five pumping stations along the line was assigned to a western firm, Bird Construction Co.

At Lachine, Que., eight-cylinder diesel engines specially designed for pipe line service are being built for the first time in Canada to supply the industry.
Rowland Chapman Moore
1893–1951

Rowland Chapman Moore, manager of Imperial's department of employee relations since 1947, died suddenly in April at his home in Toronto.

Mr. Moore was born in Halifax 57 years ago. A graduate engineer of the Nova Scotia Technical College, he joined the Company at Imperial refinery, Halifax, in 1921. Later he worked at Sarnia refinery and then as an engineer with the manufacturing department at Toronto. In 1939, he was assigned to general refinery operations. From 1937 to 1939 he made several trips to inspect refineries in Colombia and Peru. In 1948 he was appointed assistant manager of the department of employee relations, becoming manager a year later.

During his active career Mr. Moore devoted his energies toward maintaining good employee relations. Long before Imperial's employee relations department was organized he was probing some of its functions privately and quietly. He was never too busy to answer a problem or recommend a solution. To hundreds of Imperial Oil employees across the country his death is a personal loss.

Executive Changes

A. G. DeMont Elected a Director of Imperial Oil Ltd.
A. Gordon DeMont, general manager of Imperial Oil's marketing department, was elected a director of the Company at the annual meeting of shareholders at Sarnia, in April.

A veteran of World War I, Mr. DeMont joined Imperial in 1919 at Sydney, in Nova Scotia, as a warehouse agent. In 1922 he became a salesman at Amherst, N.S. Three years later he was appointed assistant manager of Imperial's Halifax division and later became manager.

In 1933 he transferred to Toronto as sales manager of the Toronto division, a post which he filled until 1938 when he was appointed supervisor of branches. He was subsequently named regional sales manager for eastern Canada and Newfoundland.

Mr. DeMont was appointed assistant general manager of the marketing department in 1943 and general manager in 1947.

Dr. O. B. Hopkins Resigns as a Director of Imperial Oil and as President of Interprovincial Pipe Line Co.

To devote more time to government duties, Dr. Oliver B. Hopkins, director of the petroleum division of the Department of Defence Production, has relinquished his position as a director of Imperial Oil and as president of the Interprovincial Pipe Line Co. He will continue to be a vice-president of Imperial and a director of Interprovincial.

Born in Virginia, Dr. Hopkins was educated there and at Johns Hopkins University where he obtained his B.A. and Ph.D. degrees. He joined Imperial in 1919 and in 1921 he was appointed chief Company geologist.

Dr. Hopkins was appointed a vice-president of Imperial Oil in 1944 and a year later was elected to the Company's board of directors. When the Interprovincial Pipe Line Co., was formed in 1949 he became its first president. Early this year he was appointed director of the petroleum division, Department of Defence Production. Dr. Hopkins is also the 1951 president of the Canadian Institute of Mining and Metallurgy.

T. S. Johnston Becomes President of Interprovincial

Thomas S. Johnston, who left Imperial Oil in 1949 to become vice-president of the Interprovincial Pipe Line Co., has been appointed president of that company succeeding Dr. Hopkins.

Born in Sarnia, Mr. Johnston attended schools in the United States and Mexico. After graduation from Williams College, Williamstown, Mass., he worked for Standard Shipping Co. In 1941 he became assistant manager of the marine department of the Lepe Oil and Transport Co., at Aruba in the Netherland's West Indies. The following year he was leased to the Standard Vacuum Oil Co., and in 1944 he went to South America on a project on the Magdalena River in Colombia. He also worked in Ecuador and Peru.

Early in 1948 Mr. Johnston returned to Canada as assistant manager of Imperial's marine department, becoming manager later in the year. He was appointed assistant to Imperial's vice-president in charge of transportation and supply in 1947.
A Billion Dollars At Work

More of the story of how Canada pushed its way through the first stage of the road to self-sufficiency in oil has been told in terms of people—the people who drilled the oil wells, who planned the pipe lines and the ships and the refineries—the men who swung picks, drove bulldozers, waded swamps or sighted transitas.

But after you have looked at all these individuals doing their jobs, after you have seen how each job contributed in its own way to the final goal, you still haven’t answered all the questions of “Why?” and “How?” Why were all these people at work on the various parts of this project? How was it made possible for them to do this work? What brought all the separate parts and people in the project together?

The simple answer, of course, is money—capital if you prefer. But while capital was obviously necessary, you still are left with the question of how capital was made available for this particular project.

The reason people were willing to provide capital for a vast project like the oil development is simple enough—Canada’s rapid growth has made steadily larger supplies of oil a necessity. The amount of oil that Canadians required in 1946 was 70 odd million barrels. Consumption has grown so fast that it will probably reach 148 million barrels this year—a jump of 87% in five years. And a similar, though less marked growth in oil demand has been taking place in other parts of the world.

That was the real foundation for the development. Without that solid foundation of social need, the whole project could never have been launched.

Granted the fact that everyone seemed to want more oil and that more oil would require capital, was there enough capital for the job?

The amount of capital that was needed for the first five years—that is, to the end of 1951—is estimated at $760 million for the western development. For development and expansion outside the prairies, something over $290 million will have been required by the end of the year.

So the total amount of capital required for oil development and expansion has been about a billion dollars for the five years. A billion dollars that might have been spent on other things had to be saved and invested in the oil development.

Whether or not a billion is a big or small number depends on what you compare it with. A billion is very big compared with an individual’s income. But it’s not very large compared with Canada’s total income. We spend about a billion on tobacco and alcoholic beverages in a year. A billion is less than a quarter of what we pay in taxes every year. It is around a third of what the nation saves in a year.

In comparison with the total earning power of the Canadian people a billion dollars, spread over five years is not very large. But this billion was all for one purpose—expansion of oil supplies—and Canada needed many other billions for growth in other directions. Every dollar needed for oil development between 1946 and the end of 1951 was matched by 16 other dollars needed for other types of expansion.

Against the $1 billion for oil, the five years have meant $3.6 billions for homes; $9.5 billions for other industries; $900 millions for schools, hospitals, churches and other institutions; $2.2 billions for highways and other government works.

Even in a country which is so productive and where living standards are so high as in Canada, it has not been an easy task to find all this capital. Up to a quarter of our yearly production has been earmarked for the future—invested in growth instead of spent on current living.

The fact that there are plenty of other demands for the available capital complicates the job of raising money for a major project. A further complication is that savings are to a considerable extent specialized. That is, every dollar saved is not necessarily free to go to work at any and every job which needs capital.

For example, about half of all the money which Canadian individuals save is put into life insurance or pension funds of one sort or another. As a rule, the law forbids the officers of these funds from investing in risky undertakings. They can put money into bonds or mortgages, sometimes into shares, but only if they are shares of companies that have been paying dividends for a number of years. The rules governing these insurance and pension funds vary considerably, but generally speaking they prevent this important part of the nation’s savings from being put to work in risky ventures.

There are somewhat similar rules controlling the investment of the estates of deceased persons. Trustees act and other legislation are put there to keep this sort of money invested in the less risky forms of security.
Every $1 needed for oil development in the past five years has been matched by $15 needed for other types of expansion in Canada — for new homes, schools and institutions, government works and other industries.

Provisions of this sort meant that a large chunk of Canada’s available capital was not going to be freely available for the risky business of drilling oil wells. But this “safety-first” money could be put into mortgages or bond issues. And when the time came after the crude oil reserves had been proved up and it was known that a big oil movement between west and east was possible — this safe-money found plenty of work to do. It bought bonds issued by many companies such as the Interprovincial Pipe Line, Imperial Oil and Pipe Line Tankers, (the firm which owns the Imperial Leda and the Imperial Refiner which are now chartered by Imperial.)

But what about the risky parts of the undertaking, the parts of the job which insurance and similar money wasn’t permitted to undertake? Funds for this part of the project had to come from a different part of the savings stream. One source was the private investor. Private investors put up money for the shares, debentures and bonds of oil companies old and new, for scores of new businesses to serve and equip the oil fields, for the purchase of proven oil lands from the Alberta government and to grubstake exploratory oil work.

The part that private savings play in a big industrial change is a good deal more important than sometimes appears on the surface. Perhaps this is because private savings and capital come in small but numerous packages, each of which may be hard to value. Private capital consists of such personal things as the few hundred to a thousand or so that each worker on a project may have invested in training for his job. Or it might take the form of a thousand or two spent on a bulldozer by a jobbing contractor, or a merchant’s investment in his shop. All these individual investments are necessary parts of any broad development. All of them require individual savings and a great many of them are assisted by the savings banks across the country.

When you look past the millions or billions of capital needed to bring people together to work on a big project like this oil development it comes home that there are various kinds of capital, with various restrictions on their use. The life insurance officer can put his policyholders’ savings only into the sort of investment which the law allows and his judgment recommends. The trustee of an estate is ruled by law or by the terms of a will. Banks are restricted on the way they can lend out their depositors’ money. And so on, down to the small savings of single individuals who are legally free to invest in almost anything they please, but whose common sense should restrict them to the sort of investment they can understand and keep an eye on.

All this boils down to the fact that the nation’s savings are not a pool or reservoir which can be drawn off in any direction, but are more like a multitude of streams with fairly well-defined channels. One stream of savings will flow only in the direction of bonds or mortgages, another may be diverted to stocks and shares, and so on. But not very much of the nation’s saving can be expected to find its way to the riskiest, earliest stages of a development.

This early pioneering — you might call it the experimental stage of an industrial development — calls for a very special sort of capital. Risk capital is needed, but above all it must be capital that is “educated”, that is handled by people who know the business.

Much of this pioneering money must come from within the industry itself, for the simple reason that only those who have a wide experience in the industry can appreciate the risks involved. Incidentally, the need for “educated” investing is one of the reasons for international lending. Educated British railroad capital played a major part in building the railways of Canada and the United States. Canadian public utility and mining capital has developed mines and public utilities in many overseas countries. American, Dutch and British oil capital has played a similar pioneering role in the oil development of Canada and many other countries.

"Educated" industrial capital can be supplied through firms in the industry concerned in two ways.

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**Table and Charts are from Imperial Oil Limited Annual Report, 1950**
They can get money by selling or borrowing against their assets. They also "generate" capital through normal operations.

How industrial corporations raise capital can be seen in the Imperial Oil Ltd. Annual Report for 1959. In a source and disposition of funds statement, this report shows how some $90 million of the required oil capital came from and where it went.

Part—about $16 million—came from the provision for depreciation and other reserves. Depreciation of plant and equipment is a very real cost of doing business and has to be included when the bills are sent out. But this part of the cost of doing business is different from the cost of wages or raw materials—it doesn’t necessarily have to be paid for as the money comes in. Instead, it may be accumulated for perhaps years before it is spent.

An example would be a farmer’s tractor. He has to set aside money every year for the eventual replacement of the tractor, but it may be several years before he finally comes to replace the machine. When that time comes he may decide to buy a combine instead of another tractor. In the meantime, the funds accumulating for a new tractor may have helped finance other operations and purchases.

Another source of industry-generated capital is earnings. Instead of paying out all they earn in dividends, most expanding companies put part of the earnings back to work in the business. In 1959 Imperial plowed back about $16 million equal to 3.59 cents on every dollar received.

Finally, many industries invest in the securities of outside companies, and those securities can be sold to raise capital for other purposes. Imperial’s former holdings of International Petroleum and Boyalite Oil Co. stock are cases in point. In 1959 Imperial realized a little more than $28 million from the sale of investments.

The total of $90 million which came into the oil development through Imperial last year is not very large in comparison with the five-year need of the industry for around $1,200 million. Yet this type of capital, from the industry itself, looked after certain parts of the job that could not well have been handled by outside money. It was the fertilizer-on-the-spot money, the money available for carrying out Imperial’s earlier commitments. This money did the job that could not have been financed by public bond issues—but by getting those jobs done, it opened the way for broader participation later on.

But whichever stream of capital you look at, you find that each was necessary to some part or other of the vast project that began with the discovery at Leduc. The nation’s money has circulated many times since 1947. Each time round it has left more homes, more businesses and industries behind it as tokens of the growing wealth of Canada.

It’s to be hoped that the cycle of savings and investment continues for many years, or to put it another way, that Canada continues to grow. The country will grow so long as its people continue to want more of everything, and so long as they continue to provide the many forms of capital needed to produce the things they want.

Oil Fleet

For half a century ships wearing Imperial colors have been plying their bluff bows into Canadian ports to deliver oil. Last year the ships operating for Imperial moved more than 68 million barrels of crude and products.

In 1959 three small barges which plied the St. Clair River were the entire fleet but now some 50 ships are in Imperial service on the oceans, on the Great Lakes, or in traffic on the St. Lawrence and along the east and west coasts of Canada.

The three barges of 1959 and their small puffing tug were joined in 1960 by the Company’s first chartered tanker—the Imperial—which carried 6,800 barrels. Over the years they and their successors were replaced by bigger and still bigger ships. Now there are such floating giants as the Imperial Alberta which can carry 229,000 barrels of oil from the Middle East across the ocean to Canada, and, on the lakes, the Imperial Leduc and the Imperial Redwater, each of which can carry 115,000 barrels.

Including the two big new lake vessels, the basic Company fleet consists of 36 tankers with a total deadweight tonnage of 220,000 and a capacity of 1,903,590 barrels. There are eight deep-sea tankers administered by the Imperial Oil Shipping Co. Ltd.; thirteen Imperial Oil Ltd. tankers on the Great Lakes; and five tankers that are usually on river or coastal service but some of which may be diverted to the ocean and some to the Lakes as occasion arises.

On the Pacific coast two tankers operated by Imperial’s marketing department, not by the marine department, transport supplies to British Columbia ports that are hemmed in by the mountains and where no roads exist.

To supplement the fleet of Company-owned ships, Imperial charters tankers for increased transportation. There are on charter for the ocean traffic.

The Imperial Leduc and Imperial Redwater are on charter from Pipe Line Tankers Ltd., but in 15 years ownership will pass to Imperial.

The older lake tankers range from the Imperial Cobourg, formerly the Imperial, which was built in 1913 with a capacity of 34,700 barrels to the Imperial Sarnia built three years ago which can carry 56,000 barrels.

Together all the tankers, big and little, in the ocean, lake or other service, have the job of providing economical transportation for oil and products needed by Canadians.
A Queen Keeps a Date

In the Imperial Latoc's pilot house, trial captain Floyd Boult waited until the chronometer indicated 7 o'clock, then went no longer because every moment of time is important to ships going out on a running trial—and the Imperial Latoc had a date for duty just two weeks away.

Capt. Boult stepped to the open window with its view of the cloudy early-morning sky and looked down at the waiting crew. "Cast off," he shouted.

Wincing clanked as the steel cables came inboard, a fusing tug picked the big ship's steam line and the engine room telegraph rang as the indicator settled on "slow ahead."

The tanker moved slowly and cautiously through the twisting entrance to Collingwood harbor, out into Georgian Bay for a day which would test her equipment. Aboard were officials of Imperial's marine department, of Collingwood shipyard and others. The ship still belonged to the shipyard which had built her, and she was being put through her paces for acceptance by Pipe Line Tankers Ltd. Once accepted, Imperial Oil would charter her.

The tests were held on a day disliked by sailors—Friday the 13th—but things were being rushed, for in less than two weeks—at precisely 9:30 a.m. on April 34—the new tanker was due at Sarnia with the first load of Alberta crude aboard. And despite old superstition, the trial went well.

On speed trials she made 14.24 knots and on an overload test she did 14.0—battering her designed speed by more than 1.5 knots. Steering trials revealed that she is an exceptionally easy ship to handle; a fact which navigational officers appreciate when the ship must sail through winding river channels.

As night fell the big ship came to anchor off Collingwood. Capt. W. H. Stedman, manager of Imperial's marine department, accepted her on behalf of the Company. His signing of the acceptance meant that the Imperial Latoc now came under command of Capt. T. K. Russell Knight and trial captain Floyd Boult relinquished the bridge.

Men from the shipyards gathered their gear and climbed down a Jacob's ladder to the deck of two tugs. The tanker lay at anchor until the transfer was made, then sailed for Sarnia, Ohio, and final inspection in drydock. The marine department wanted to send her to Port Arthur, where her sister ship Imperial Dextrous was then being outfitted, but for still blocking the Port Arthur dock and accordingly it had to be Sarnia.

There, shipyards workers swarmed over her great bulk and on the evening of Thursday, April 18, the overhaul was complete and she was refloated.

About midnight the Imperial Latoc left Sarnia, heading west on Lake Erie. Through the night her ship-to-ship telephone exchanged messages with the Imperial London and at 7 a.m. the smaller tanker was alongside. The ships met in the Detroit River, just below Windsor, and with engines at "slow ahead" to breach the river current, the tankers stayed together until 500 barrels of bunker tied flowed into the Imperial Latoc's tanks to pass her on her first trip.

During the transfer two brothers met Capt. Bert Knight, of the Imperial London, came up to inspect the pilot house of the Imperial Latoc and chat with Capt. Russell Knight. At 7.30 the operation was completed and the London cast off and headed downstream.

The Imperial Latoc picked up speed, passing Windsor and Detroit and heading out into Lake St. Clair. She sailed along the cottage-lined banks of the St. Clair River and, about 9 p.m., was busy answering the whistled greetings of ships and factories—and even car horns—as she moved by Sarnia.

Capt. Knight left the bridge as the tanker headed out into Lake Huron and as she steamed down for the

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That evening the ship's alarm system called all hands out for a fire and lifeboat drill. Figures wearing lifejackets emerged from the quarters and ran to their stations. Soon fire hoses were in play and alarm stations manned.

The Imperial Leduc has two main fire extinguishing systems, using steam and carbon dioxide. Portable extinguishers are placed at strategic points, fire-retarding paint is used in quarters and even porthole curtains are glass fibre.

The fire drill completed, the crew swung a lifeboat out on its davits. At the touch of a lever the launching equipment can swing out and lower a boat into the water. The tanker's four boats are made of aluminum.

In an emergency, the bridge can direct the crew not only by alarm and whistle signals, but verbally through a loud hailer, like a public address system. Loudspeakers on the bridge wings, bow, stern and in the quarters can call the crew at any point in the ship. From certain points such as the bow, stern and officers' most two-way conversations can be held. The big speakers on the bridge have been heard a mile and a half from the ship.

Before dark, the air took on a keenner chill and snow could be seen on the hills of the Keweenaw Peninsula off the port beam.

As night fell, off-watch officers and the visitors aboard the tanker's first trip gathered over coffee in the recreation room. Among them was Peter M. Duncan, Imperial's naval architect, who had designed the ship. He has few equals as a storyteller, and general laughs followed his delivery of punch lines in the Scotch accent he has retained.

Duncan was watching every feature of the ship's performance. In his designs he had one eye on safety and efficiency of operation and the other on comfort of the crew. He kept his slide rule busy during the entire trip, calculating the difference between theoretical and actual performances now that his plans had been translated from paper into a great vessel.

As the Imperial Leduc sailed through the night the weather changed. By Saturday morning the decks were wet with falling snow and the ship was moving through ice which was packed into the western end of Lake Superior. Her whistle sounded three blasts each minute.

Off to starboard a freighter, stuck on an ice floe, turned with rubber hard over while a U.S. coast-guard vessel stood by. Downbound ships loomed out of the snow, passed astern and the Imperial Leduc went on, using the passage they had cut through the drifting ice.

On the bridge Captain Knight was using radar to aid navigation. Visibility was about two miles, and the north shore of the lake showed up a mile to starboard. The ice had packed in on the south shore and ships were following along the north shore.

The ship-to-ship telephone, always set on the listening range, came to life.

"Hello Imperial Leduc. Hello Imperial Leduc. Duluth calling on range two. Come in, please." "Imperial Leduc answering Duluth. Come in, Duluth; over," Capt. Knight replied.

The voice of Capt. Kelly, assistant manager of the marine department, who had flown to Superior, came in. Ice, he said, was blocking the Superior entrance and the tanker would have to come in the Duluth entrance and down the channel sheltered by an island and ice-free, connecting the two lakehead harbors. Tugs would be available for berthing the Imperial Leduc when she reached the oil dock.

Capt. Knight acknowledged and ended the conversation with the familiar "Imperial Leduc clear!"

Soon afterwards the ice-breaking car ferry Sainte Marie, stationed off the harbor to help ships through the ice, greeted the tanker with her whistle and Imperial Leduc replied. Passing under the Duluth lift bridge at 9:55 a.m., the tanker turned off to port and passed down the harbor channel towards Superior.

At 10:45 the tug Vermont took the tanker's bow line and the big ship eased into the pipe line wharf where crude from Alberts—over a thousand miles away—was waiting to be loaded. She was made fast at 10:57 and the pumps were started to take out the water ballast in her tanks. When it was removed the bow rose high, draft marks showing the ship drawing less than three feet at the bow and about 13 feet at the stern.

With loading hoses connected, oil began to flow into the ship's tanks at 3:10 p.m. At first it flowed by gravity only, for the pipe line's big tanks are set on a hill 600 feet above the level of the lake. About 10,000 barrels flowed through the lines in the first hour, but later pumps ashore were started up to increase the rate.

The tanker's capacity is 115,000 barrels on a 24-foot draft, but since she was forced to use the...
Superior-Duluth inter-harbor channel, with a depth of 22 feet, she could be loaded only to 21 feet. Hence, her cargo was cut to 57,000 barrels.

At 20 minutes after midnight on the Sunday morning the loading hoes were disconnected and the Imperial Leda's turbines were being warmed up. An hour later Capt. Knight rang "slow astern" on the engine room telegraph and the big ship backed slowly away from the wharf, turned and headed north up the channel to Duluth.

She retraced her course through the ice off Duluth, pulled off the track to let another steamer pass, and was back in the A. I. F. car ferry Sainte Marie, however, her fare in less than an hour.

By noon she was making an average speed of 13.82 knots having passed Two Harbors, Devil's Island and Outer Island.

With a westerly wind raining whitecaps, the tanker sailed eastwards in bright afternoon sunlight, rounded the tip of Keweenaw Peninsula and passed Manistee Island. Capt. Knight's plan was to make the Sault locks after daylight on Monday. At 8:15 the ship was in lock No. 4. Two deckhands had been put over the side on landing rafts to help handle her lines, and were back on the ship before she moved through the lock gates 45 minutes later.

Down St. Mary's River she went. Capt. Knight took her through the West Nishibish Channel, where a narrow rock cut demands expert handling, and out into Lake Michigan. He stood directly in front of the wheelman, looking out the centre window of the pilot house. The twisting river channel demanded a steady flow of orders, which he delivered without an extra word.

As the channel broadened into the lake, Capt. Knight rang the engine room on the inter-ship telephones.

"Seventy revolutions," and received the answer "Seventy revolutions, sir."

He hung up and the ship picked up speed as her propeller added 20 more revolutions per minute. She entered Detroit Passage shortly after noon and at 16:48 passed the squat lighthouse marking Detroit Reef at the entrance to Lake Huron.

The downbound course was clearly marked on the chart: Detroit Passage to Middle Island, 56 miles; Middle Island to Harbor Beach, 165 miles; a further run of 58 miles on a course of 189 degrees — due south — would take her right into the St. Clair River.

While their tanker sailed down the lake, the crew were settling into routine as the strangeness of a new ship wore off. Quartered afloat, not more than two men share a cabin and most of the rooms are singles. For get-togethers, they have a recreation room off their mess, and cards, reading and listening to the radio pass the off-watch time for those who aren't busy scrubbing socks or shirts in one of the two laundry rooms.

Others stretched out on their bunks or tilted their rooms. The rooms, heated by forced warm air, have steel furniture, washbasins and clothes closets, and are a startling contrast to the days when sailors lived in a crowded forecastle.

The officers too have their own recreation room with an adjoining pantry for eight meals of sandwiches and tea or coffee. The pantry is supplied from the galley aft. There, labor-saving devices help the steward-cook and his assistants to feed hungry men. An automatic dishwasher handles what used to be a dreary chore and an electric cake mixer whips up various dishes for the crew. Big refrigerators keep ample stores fresh.

But while the off-watch crewmen enjoy leisure, the bridge and engine room are at work. The officer of the watch is constantly on the move, watching through binoculars for markens ashore, trying the radio direction finder to obtain bearings, glancing at the tachometer which shows propeller revolutions or the electric log which records distance covered. To keep the ship on course the wheelman has both magnetic and gyro compasses, plus a helm indicator which tells how much the rudder is turned.

In the engine room the on-watch engineer is always busy at some chore or other designed to keep the big ship moving smoothly and safely. There are scores of dials, gauges, and indicators to be checked. The engine room even has a telephone booth, sound-proofed, so that a telephone call from the bridge can be answered without engine noise intruding.

Because the Imperial Leda was not due to pass under the Blue Water Bridge at Sarnia until 9.30 the next morning, she had time to spare. Speed was reduced to 10.5 and then to 8.5 knots as she moved through the night. At breakfast Capt. Knight wore his new uniform, with gold-leaved cap, and the officers wore white coversalls with uniform caps.

The lake was misty and a few drops of rain fell. The Lake Huron lightship, off the St. Clair River entrance, was passed at 9.08 a.m., and soon the outline of the Blue Water Bridge appeared.

At exactly 9.30 the Imperial Leda thrust her bow under the high, arched span over the river. At 10.30 a.m., again right on schedule, the ship, which had dropped anchor in the river and swung around, was secure at the new wharf below Sarnia refinery. She had sailed 1,928 miles to keep a date right to the minute.
Men of the Ships

Capt. T. K. Russell Knight smiles down from the bridge wing of the Imperial Leduc as his ship is berthed at Sarnia. On her maiden voyage from Superior she brought her into Sarnia on time right to the minute.

Chief Engineer William G. (Bill) Sinclair of the Imperial Leduc is in charge of the three steam turbines that can develop 4,000 horsepower.

Capt. E. A. Davies, a native of Halifax, commands the Imperial Redwater. A veteran of the war, he also served at sea during the war and for his performance in the cargo trade, he was made an Officer of the Order of the British Empire.

The Imperial Leduc and the Imperial Redwater are men of long service in sailing the Great Lakes for Imperial Oil. The Imperial Leduc's Capt. T. K. Russell Knight was born a stone's throw from Sarnia refinery and was made an Office by his father, Thomas Knight, who is a retired refinery still operator.

Capt. Knight's job was as an ordinary seaman and he later became a deckhand on the Royalite and three years later was a mate on the Isolite. His first command was the Sarcolite in 1929. He later became a chief engineer on the Valencia and this year he will retire. He has been with Imperial since 1928 and is retiring at the age of 65.

In the Chief's realm are complicated devices which control the dozens of pieces of equipment needed to sail her safely: pumps for cargo and water ballast, pumps for fuel; generators for electricity and dozens of other devices, including one which automatically adjusts the fuel and air mixture going into the boilers and "anticipates" what steam will be needed.

On the Imperial Redwater the engine room is in charge of John Maxwell, formerly of Imperial London. Born in Glasgow, he has been with Imperial Oil since he joined the Company in 1928 as a third engineer.

These are the men who have charge of the power plants which drive the world's largest freshwater tankers. They will play an important part in bringing Alberta oil to Ontario.

Evaporating 55,000 pounds of water an hour, which can go to 68,000 pounds if necessary. The ship uses about 250 barrels of bunker fuel a day and Chief Sinclair said he would regularly carry 1,500 barrels on the five-day trip to Superior and return—leaving a 250-barrel margin in case of delay.
The Steps Ahead

It is good reason to believe that Canada's oil industry—in many respects the country's fastest growing industry in the past four years—will continue its rapid progress. The oil companies are spending many millions of dollars on expansion and development in the west and on undertakings elsewhere in Canada.

Imperial is continuing its large-scale exploration and development program and in addition a number of major projects are planned or are already in progress. The Company intends to build a 190-mile pipe line to deliver oil products from Sarnia to London, Hamilton and Toronto. The final touches are being given to the Winnipeg refinery which has just gone "on stream", helping the prairie provinces to approach self-sufficiency in oil products. The equipment at Sarnia and Edmonton refineries is being expanded and modernized and at both plants fluid catalytic cracking units will be built to produce high octane gasoline. Another 625-foot tanker is taking shape in the Collingwood shipyard to join the sister ships Imperial Redwater and Imperial Leduc in moving Alberta crude across the Great Lakes to Ontario refinery ports.

Because of the tense international situation some expansion plans depend upon whether or not steel and other supplies can be obtained. But oil is needed for defense as well as in peacetime, and the essential character of the petroleum industry is generally recognized. Accordingly, it is expected that supplies will be made available for construction projects necessary for Canada's oil supply.

Demand for Oil Continues to Increase

Canadians are using more and more oil. At the Imperial Oil annual general meeting G. L. Stewart, president of the Company, said: "We expect that in 1951 we will further increase our output of crude and products and step up our activities in all departments. Our statistics have estimated that the volume of sales should increase by about 14 percent. Over the 1950 record, and reports for the first quarter suggest that this is a conservative estimate because we have had an increase of approximately 20 percent, or about 2,700,000 barrels, in our sales volume."

Because of the continuing rise in the demand for oil products one fact is all too evident. Although Canada can produce about one-third of her present oil requirements, still greater reserves of crude must be found. For this reason, the expenditures on the continued search for oil tops Imperial's list of plans. Last year the Company spent more than $36 million on exploration and development. This year expenditures may be even greater as the search reaches out further into untapped territories.

Imperial's marketing department requires expanded facilities for the distribution of the Company's products. The department has drawn up a construction program that will cost more than $12 million in 1951. This includes building new bulk warehouses and storage tanks as well as the improvement and modernization of existing retail facilities.

Products Line from Sarnia to Toronto

To help ensure the steady flow of supplies to the heavily populated and industrialized areas of central Ontario, Imperial intends to build the 190-mile products line from Sarnia to Toronto. The planes have reached a point where it is reasonably sure the project will be completed and go into service in 1952. The line, costing between $8 to $10 million, will be of 10-inch and 12-inch diameter pipe and have an initial capacity of 59,000 barrels daily. With additional pumping facilities it will be possible to increase the capacity to 49,000 barrels daily. The Sarnia to London, Hamilton and Toronto line will operate year-round. It will move gasoline, diesel and furnace fuels, kerosene and gas oils. The increased demand for these products in central Ontario could be met by building more tankers and extra tankage but the pipe line will be more practical.

In addition to requiring less steel, the pipe line will enable the Company to make more flexible supply arrangements. Using tankers, the winter consumption of the various products would have to be estimated in advance and brought in before the close of navigation. A pipe line, however, can deliver the season's products and can be pumped through as needed. The new line will not result in reductions in product prices, but transportation costs will be about the same as they are now.

Product pipe lines are not new to Imperial. The Company built its first such line in Canada in 1957, and an 11-mile stretch near Port Norman. Large deliveries of petroleum products from Norman Wells to Port Radium and other mining points on Great Bear Lake are being blocked by the rapids on the Bear River. The oil is transferred to the pipe line, travels underground, misses the rapids and then is picked up by other ships to continue on its way. This trans-

portation operates only during the brief sub-Arctic summer.

The newest addition to the crude oil transportation system in the west is in the Excelsior field, 12 miles north of Edmonton. Here the Company, through its subsidiary, Imperial Pipe Line Co., has just completed a gathering system in the field which is linked with Interprovincial's Redwater-Edmonton line by a nine-mile feeder line of six inch pipe.

The gathering system required five miles of two to four inch pipe and the network has seven pumping units at present. At the "Gateway to the West" Imperial's new Winnipeg refinery is now processing Alberta crude brought in through the 75-mile Winnipeg pipe line from a take-off on the Interprovincial line at Gretna, Man. Construction of the 10,000-barrel-a-day plant was started in April last year.

This 810 million refinery, located on the east side of the Red River north of downtown Winnipeg, is turning out gasoline, kerosene, tractor, diesel and stove and furnace oils and heavy products like bunker fuels and asphalt. The refinery's products will be distributed not only in Manitoba but also to some areas of northwestern Ontario.

Recently Imperial announced that contracts totalling $8 millions have been let for the construction of new units at Sarnia refinery. An additional $5 millions will be used to increase the water pumping and steam generating facilities at the plant.

Sarnia's new units will include an atmospheric and vacuum distillation unit, a light ends recovery plant and a fluid catalytic cracking unit. Additions to the Edmonton refinery also include a fluid "cat cracker".

The first fluid catalytic cracking unit in Canada was completed in 1949 at Imperial's Montreal East refinery and has proved a success. The process is the modern desulfurizing and reracking of crude oil and increasing its yield of gasoline.

"Cat Crackers" for Sarnia and Edmonton

Both the Edmonton and the Sarnia "cat crackers" will be of an improved design, the first of their kind in the world. They were designed by Standard Oil Development Co., after exhaustive tests. The result is a catalytic cracker which is simpler to operate and more efficient. It enables refineries to balance product requirements and anticipates the future demand for higher quality motor fuels.

The Sarnia "cat cracker" with 33,250 barrels daily capacity and the distillation unit, with a capacity of 46,200 barrels per day, will be the largest of their kind in Canada. They are being built as part...
The new tanker will cost in the neighborhood of $41.5 million and will have the same dimensions as her sister ships: length 629 feet; breadth 68 feet; speed 13 knots; capacity 115,000 barrels. It will be able to move about 5,000,000 barrels of oil in a season and will carry a crew of 36.

The Interprovincial Pipe Line Co., has its own expansion program and already has taken steps to increase the capacity of the line that carries Alberta oil eastward. Last fall when the flow valves were officially turned on the 1.126-mile pipe line the initial capacity was 85,000 barrels a day. That there is an increased demand in Ontario for western crude six new pumping stations to increase the input capacity to 146,000 barrels a day will be installed.

Four of the new stations will be built in Canada and two in the United States. These will be located at: Hardisty, Alta.; Leedborn and Glenavon, Sask.; Glenbow, Man.; and Deer River and Viking, Minn. At the same time additional storage tanks to accommodate 2,000,000 barrels of crude are being erected at Superior, Wis., terminus of the Interprovincial line. This will bring Superior’s tankage to 4,000,000 barrels. Work is also progressing on the installation of 20 new storage tanks at Sarnia. They will have a capacity of 3,000,000 barrels.

Commenting on Interprovincial’s program Mr. Stewart said, “Our people have estimated that if the Interprovincial pipe line is able to get the materials for carrying through with its program for increasing deliveries to lakehead, about 17 million barrels of Alberta crude will be moved into the Ontario market.”

“This is of course important to us because we are large producers of Alberta crude and will share on a pro rata basis in the Alberta production.

“But, however, it does not follow that there will be a correspondingly increased consumption of western crude at Sarnia refinery. This is so because Imperial Oil will not be the only user in Ontario of western crude. It is expected that our competitors will also want Alberta crude and they will be as free as anyone else to buy crude from the producers and to share in the pipe line capacity. For that reason, although we believe total movements to Ontario may be enlarged, our Sarnia deliveries may not increase.”

The plans of Imperial Oil and of the Interprovincial Pipe Line Co., are only a part of the great expansion program being undertaken by Canada’s oil industry. Other companies have major refinery and other construction projects on the drafting boards or in progress. Pipe lines for the export from Alberta of natural gas and crude to the Pacific coast are being discussed by a number of interested companies. The search for oil is reaching new peaks.

In short, Canada’s oil industry is growing rapidly and day by day new facilities are being added for future service.

PERSONALITIES IN THE NEWS

S. B. Scott Retires as Assistant Comptroller

Stuart B. Scott, assistant comptroller of Imperial Oil since 1944, retired recently after 32 years’ service with the Company. Mr. Scott, who was born in England and came to Canada in 1906, is a former deputy treasurer of the city of Regina. In 1916, he left this position to serve with the military headquarters’ staff in Regina. He joined Imperial at Sarnia in 1919 and held various accounting positions before becoming assistant secretary-treasurer in 1943 and assistant comptroller and assistant treasurer in 1944. He has been active in community affairs in Sarnia and was manager of the Sarnia Imperial team when they were Dominion champions in 1924 and 1926.

Irving McGrath Receives New Appointment

Following the retirement of S. B. Scott, J. H. Spence who has been with the Company since 1926 became senior assistant comptroller. Two new assistant comptrollers have also been appointed. In his new position Irving McGrath will be responsible for marketing accounting operations throughout the Company, working from Toronto. Born in Sarnia, Mr. McGrath joined Imperial in 1913. He worked in many phases of refinery operations before joining the accounting group at Sarnia in 1927. In 1936 he joined the comptroller’s department and before his recent appointment was office manager of the department.

A. P. Mochin, Assistant Comptroller at Sarnia

A. P. Mochin, an assistant comptroller of Imperial Oil with headquarters at Sarnia, will be in charge of the general accounting division of the comptroller’s department. Mr. Mochin was born in Brougham, Ont. He went overseas with the Canadian Army in 1917, and on his return joined Imperial in the accounting department at Halifax refinery and later was moved to Sarnia. In 1942 he was loaned to St. Clair Processing Corp. and later Polymer Corp. as manager and later assistant to the president. He left this position in 1947 to return to Imperial Oil as assistant to the general manager of refineries.

E. W. Shaw, Geological Advisor

E. W. Shaw, geological advisor of the producing department at Toronto, was born in Cardale, Manitoba. He graduated from Brandon College in arts and science and in 1935 obtained a Ph.D. degree at the University of Toronto. He worked as a geologist with several mining companies and from 1941 to 1945 was with the Inspection Board of the United Kingdom as a technical officer. Mr. Shaw joined Imperial in 1945 as a geologist in the production department, Calgary, and later was appointed division geologist, serving in that position until his transfer to Toronto.

D. B. Laver, Division Geologist, Western Producing

D. B. Laver, formerly with the research department, western producing, has been appointed division geologist at Calgary. A native of Winnipeg and a graduate of the University of Alberta, Mr. Laver joined Imperial’s producing department in 1945. He worked as a geologist on wildcat wells until 1947 when he was appointed to the subsurface department, Calgary. Two years later he transferred to the research department.
Dr. R. K. Stratford Appointed Scientific Advisor

Head of Imperial Oil's technical and research division for the past 22 years, Dr. R. K. Stratford has now been appointed to the newly created position of scientific advisor to the Company. He was born in Brantford and attended the Ontario Agricultural College at Guelph, Massachusetts Agricultural College, and the University of Lyon, France. At Lyons, he became interested in hydrocarbon research and prepared a thesis dealing with the cracking of pure hydrocarbons for which he received his doctor's degree. In 1924 he joined Imperial as chief research chemist and two years later was appointed head of the technical and research division. Dr. Stratford was awarded a Doctor of Science degree (honoris causa) in 1949 by the University of Toronto.

Dr. George Gurd, Manager of Imperial's Research Dept.

Dr. George Gurd succeeds Dr. Stratford as manager of Imperial's research department. Born in London, Ont., Dr. Gurd received his B.A. and M.A. degrees from the University of Western Ontario. In 1932 he obtained a Ph.D. degree from McGill University. The following year he joined the Company as a research chemist. In 1936 he transferred to Calgary as technical advisor to the western refineries, returning to Sarnia in 1938. He was appointed assistant research director in 1939. During World War II Dr. Gurd was on loan to the Department of Munitions and Supply as assistant to the Director of the Chemicals and Explosives Division. In 1947 he was appointed a M.B.E., for his wartime services.

Bernard Goulston named Chief Staff Chemist

Formerly assistant manager, technical service division, Bernard Goulston has become appointed chief staff chemist of the Company's research department at Sarnia. Born in England, Mr. Goulston graduated from the University of London in 1921 with an honor B.Sc. degree. He joined Imperial in 1925 as a chemist at Montreal East refinery. Three years later he went to Talara, Peru, as chief chemist with International Petroleum Co. Returning to Canada in 1927 he was made chief chemist at Imperial's Ioco refinery in B.C. In 1938 he was transferred to Sarnia refinery. He was appointed assistant manager of the technical service division in 1941.

C. C. Bimel, Western Manager, Crude Oil Purchasing, Supply Dept.

C. C. Bimel has been appointed manager, crude oil purchasing division of the supply department, Edmonton. Born in Shreveport, La., he came to Canada at an early age and attended St. Andrew's College, Aurora. He joined Imperial at Sarnia in 1934 and for the next 10 years held various refinery jobs. From 1944 to 1946 he served with the U.S. Navy and became officer in charge of procurement and distribution of packaged petroleum products for the forces in the Pacific area, with headquarters at Pearl Harbor. He rejoined Imperial in 1946 in the economics section of the supply and economics department. When this department was divided in 1947, he became head of the programming section of the supply department.

H. H. Wilson Heads New Department

H. H. Wilson has been appointed manager of the newly-created product standards department. Born in Hagersville, Ont., Mr. Wilson attended McMaster University and the University of Toronto. He served with the Royal Flying Corps in World War I and then returned to the University of Toronto, where he obtained a B.Sc. degree in 1919. After graduation he joined Imperial as a chemist at Sarnia. Later he transferred to Sarnia to learn refinery operations. In 1924 he was appointed chief chemist at Regina refinery and in 1933 became western manager, technical service department at Regina. During the next few years he held various jobs of increasing responsibility with both the marketing and manufacturing departments. In 1940 he was appointed assistant manager of the technical service department.

Alan C. Harrop, Manager, Department Of Employee Relations

Alan C. Harrop, formerly general superintendent at Montreal East refinery, has been appointed to the newly created position of manager of the department of employee relations. Mr. Harrop joined Imperial as an assistant chemist at Calgary refinery soon after he graduated from the University of Toronto in 1933 with a B.A.Sc. degree in chemical engineering. He became chief chemist at Calgary in 1939 and the following year went to Talara, Peru, with International Petroleum Co. Ltd. He was appointed superintendent of the Talara refinery in 1941. In 1943 Mr. Harrop returned to Canada as superintendent of Regina refinery. Subsequently he became superintendent at Calgary refinery, superintendent at Sarnia refinery and in 1946 general superintendent of Montreal East refinery.

L. H. Frazer, Assistant Manager, Employee Relations

Lyman H. Frazer was born in Toronto and is a graduate of the Royal Military College, Kingston, and of the University of Toronto, commerce and finance. In 1935 he joined Imperial's Ontario marketing division and later spent three years at Sarnia refinery. After a brief period in the general marketing department he became industrial sales representative, first in Toronto and then in the Windsor area. During World War II he served overseas as the general staff of 182nd Canadian division and HQ 21st Army Group. On returning to Imperial he entered the department of employee relations. Before his present appointment he was co-ordinator of management development.

D. S. Simmons Becomes General Superintendent At Montreal East

D. S. Simmons, formerly manager of the engineering division, Sarnia, has been appointed general superintendent at Montreal East refinery. Born in Sarnia, he was educated there and at Queen's University where he obtained a B.S.C. degree in mechanical engineering in 1923. After graduation Mr. Simmons joined Imperial as a draftsman in the engineering department at Sarnia refinery. In 1943 he was loaned to St. Clair Processing Corporation as technical superintendent and later became assistant manager. In 1946 he returned to Imperial as chairman of the manufacturing technical committees. The following year he was appointed assistant manager of the engineering and development division, and manager last year.

R. W. Dunlop, Manager, Engineering Division, Manufacturing

R. W. Dunlop has been appointed manager of the engineering division of the Company's manufacturing department, succeeding D. S. Simmons. Mr. Dunlop was born in Hamilton, Ont., and received his early education in Calgary. He attended the University of Alberta and later the University of Toronto where he graduated with a B.A.Sc. degree in mechanical engineering. In 1927 he joined Imperial's manufacturing department at Calgary. In 1928 he returned to the engineering department at Sarnia and the following year returned to Calgary as assistant engineer. In 1934 he was loaned to St. Clair Processing Corp. as mechanical superintendent, returning to Imperial in 1946 in the engineering and development division and became assistant manager in 1948.

F. D. Kingsbury, Assistant Comptroller Of Taxation

F. D. Kingsbury, assistant comptroller of taxation, was born and educated in Toronto. Upon graduation in 1934 from the University of Toronto as a Bachelor of Commerce, he joined Imperial as a clerk in the tax department. During World War II he served with the R.C.A.F. and after his discharge returned to the same department where he was corporation tax accountant and analyst until his appointment as assistant comptroller of taxation.

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D. H. Cooper Appointed Manager Of Saskatchewan Marketing Division

D. H. Cooper, formerly assistant to the general manager, marketing, has been appointed division manager, Saskatchewan marketing division, at Regina. A graduate of McGill University, Mr. Cooper joined the Company in 1928 as a statistical clerk in the Quebec division. In 1939 he transferred to the marketing department in Toronto and three years later became regional assistant, industrial relations, marketing department. In 1942 he enlisted in the Royal Canadian Artillery, returning to Imperial in 1945. He was appointed management development co-ordinator in 1950 and later in the year became assistant to the general manager, marketing.

Gordon McIntyre Heads Technical Division, Marketing

Manager of the former technical service department, Sarnia, Gordon McIntyre has been appointed manager of the technical division of the marketing department, with headquarters in Toronto. A graduate of McGill University and a veteran of World War I, Mr. McIntyre joined the Company in 1921. He conducted experimental work on vacuum stills and in 1923 was appointed chief chemist at Sarnia refinery. In 1927 he became manager of the technical service department. During World War II, he served overseas with the Royal Canadian Engineers and later was technical advisor on petroleum matters to the deputy quartermaster general. He returned to the technical service department in 1945. Dr. W. W. Stewart, formerly technical advisor, marketing department, has been appointed assistant manager of the technical service department.

Frank A. Hagan Retires As Manager Of Asphalt Sales

After 31 years as manager of Imperial's asphalt sales department, Frank A. Hagan has retired. Born in Sydney, N.Y., Mr. Hagan studied engineering at the University of Syracuse. Before joining Imperial in 1916 he spent 10 years with asphalt companies in the United States. His first job with Imperial was to help in the construction of Montreal East refinery—the first refinery in Canada to produce asphalt. In 1919 he was transferred to Toronto as head of the Company's asphalt and road oil department and continued as manager of this department until his retirement.

K. D. MacDonald Succeeds F. A. Hagan

Kenneth D. MacDonald has been appointed manager of the asphalt sales department. Mr. MacDonald joined the Company as asphalt sales engineer when the department was formed in 1918. He holds a B.A.Sc. degree from Toronto University and before his employment with Imperial he was engaged in technical duties with the C.P.R., the Dominion Government Geological Survey Branch and the Military Hospitals Commission. He served with the Canadian Field Artillery during the First World War. Mr. E. L. Paterson succeeds Mr. MacDonald as assistant manager of asphalt sales.

B. A. Valde Named Manager, Construction & Maintenance Dept.

Following the appointment of H. F. Stevenson as operations co-ordinator of the marketing department, B. A. Valde has been named to succeed him as manager of the construction and maintenance department. Mr. Valde graduated from the University of Saskatchewan in 1926 with a B.Sc. degree in civil engineering. Three years later he joined Imperial as junior engineer, construction and maintenance department. In 1939 he was made field engineer, Ontario division, and the following year became assistant division engineer, Quebec division. From 1941 to 1945 he was assistant to the manager, Newfoundland division. He was appointed division engineer, Maritime division in 1945.

E. A. Taylor Appointed Manager, Service Station And Dealer Development And Merchantizing Co-Ordination

E. A. Taylor, formerly manager, cost and operating department, has been appointed manager, service station and dealer development and merchandising co-ordination. Mr. Taylor joined Imperial in 1929 in the former Hamilton division. He progressed through various positions in Ontario division and later Quebec division where in 1944 he was appointed cost and operating manager. He transferred to Toronto in 1947 as marketing cost assistant and two years later was appointed manager, cost and operating, marketing.

C. J. Reed Succeeds E. A. Taylor

C. J. Reed has been appointed manager, cost and operating department. He joined Imperial's manufacturing department at Sarnia in 1923 and in 1929 moved to Windsor as plant superintendent in the marketing department. Later he became plant superintendent at London and assistant plant and equipment superintendent of the Hamilton division. In 1939 he was appointed sales agent, Toronto, and three years later became distribution manager for Ontario division. In 1944 he was made delivery and distribution assistant, cost and operating department, the position he held until his recent appointment.

R. G. Murray Heads New Section

R. G. Murray has been appointed head of the recently-established product prices section of the marketing department. A graduate of the University of Toronto, he joined Imperial in 1935 and held various positions in the Ontario division office until 1938 when he became a member of the sales research staff. During World War II he served in the Royal Canadian Artillery from 1942 to 1946. He returned to sales research upon his discharge and soon afterwards was made senior assistant.

Ronald S. Ritchie, Assistant Manager, Co-Ordination And Economics

Ronald S. Ritchie, now assistant manager of the co-ordination and economics department, was born near Chatham, Ont., and graduated in political economy from the University of Western Ontario in 1938. Later he did postgraduate work in economics at Queen's University, and then taught there for a year at the Ontario Agricultural College, Guelph. During World War II he was with the Wartime Prices and Trade Board. He joined Imperial in 1947 and was head of the economics and statistics division of the co-ordination and economics department before his appointment as assistant manager of the department.

Samuel M. Blakely Retires

Holder of a 40-year service button, Samuel Milligan Blakely, of the Vancouver marketing division, retired recently. Born in Boston, Mass., Mr. Blakely joined Imperial in 1908 as a stock clerk in the Winnipeg office. In 1913 he transferred to Vancouver in the same capacity. He served overseas during World War I and after his discharge returned to the Company as a barrel clerk in the Vancouver office. Subsequently he became assistant cashier, ledger clerk and journal clerk and collector.
40 Years Service Buttons

John H. W. McLellan, Sarnia

John H. W. McLellan, who holds an Imperial Oil 40-year service button, was born and educated in Sarnia. He joined the Company in 1910 in the storehouse at Sarnia refinery. In 1919 he became a helper in the boiler-makers department and later transferred to the refinery department where he worked as a tube cleaner on the old pressure stills. When the stills were dismantled in 1939 to make room for modern cracking coils, he was transferred to the pipe fitting department.

T. H. Hawk, Toronto

Thomas H. Hawk, manager of the insurance and real estate department, has been presented with a 40-year button for service in the oil industry. Born in the U.S. and educated in England, he joined the Anglo-American Oil Co., in London in 1911. In 1918 he enlisted with the French Army in France. The following year he was transferred to the U.S. Army as commissioned second lieutenant in the gasoline branch, quartermaster corps. After World War I he was brought to Canada in 1919 as Imperial’s assistant manager, Toronto division. In 1939 he was appointed operations manager, Ontario division and later in the same year was assigned to special duties in the general sales department. In 1940 he became co-ordinator, real estate and insurance department, general administration.

Charles Wickes Loomis, Toronto

Born in Attica, N.Y., Charles Wickes Loomis, Toronto, joined Imperial in 1911 in the marine department at Sarnia. In 1910 he transferred to Toronto with the traffic department as a car record clerk. Subsequently he became rate clerk, and assignment clerk. His present position is statistician in the rate section of the traffic department. Mr. Loomis has always been interested in athletics and while in Sarnia played and later managed the Sarnia Independents and the Sarnia Intermediates.

Alexander Forbes, Sarnia

Alexander Forbes, fire marshal at Sarnia refinery, has received his 40-year service button. Born in Sarnia, he joined Imperial in 1908 in the cooper shop. In 1910 he left the Company to work for the Grand Trunk Railway but returned to the refinery two years later. In 1920 he was made head pumpman on shift in the refinery pumphouse. In 1943 he was assigned to the fire protection group and later became fire marshal.

LeRoy Miller, Sarnia

LeRoy Miller, clerk in the Sarnia time office, has completed 40 years of service with the Company. Born in Dresden, Ont., Mr. Miller came to Sarnia in 1908 and became an Imperial employee the following year starting in the cooper shop. During World War I he served overseas with the 4th Division Trench Mortar Brigade. Returning to Imperial after the war, he worked in the cooper shop until 1930 when he transferred to the time office.

“Oil is hard to find”

There were a number of encouraging oil discoveries during the first half of 1951 but also a long list of dry holes.

Inclined activities in the search for oil in Manitoba and Saskatchewan, as well as in Alberta, have highlighted the first six months of the Canadian oil industry’s 1951 program of exploration and development. An estimated $200 million will be spent on the program this year.

Drilling in Manitoba has been intensified since the January discovery of oil at Virden. In Saskatchewan, seismic and other preliminary exploration work has been widened, encouraged by discoveries in the United States near the international boundary. In Alberta the rapid development of the existing fields has continued and new finds by a number of companies have been added to the list of known Canadian oil-bearing areas.

While some of the results in the six-month period have been promising, the number of dry bores drilled—almost 140—proves once again that the old saying “Oil is hard to find” still is true.

Imperial has been active in all three prairie provinces and has had a share of the discoveries and of the disappointments. One of the latter was Imperial Birle No. 1, the Company’s first Manitoba wildcard.

The Birch well was located 45 miles north of the California Standard strike at Virden, where wells are producing small amounts of oil. Drilling was aban-
doned at Birtle when no oil was found even after the well had gone down 4,259 feet through all formations to the granite bedrock. A second Manitoba wildcat, near Madeline about 80 miles northwest of Brandon, also was unsuccessful and the Company now is drilling at Foxwarren, about 15 miles northwest of the Birtle site. Imperial has two seismic parties on exploration in the province. Other companies also are active in Manitoba.

With a bearing on oil possibilities both in Saskatchewan and in Manitoba, several strikes by United States interests have been reported from North Dakota. One of these is only 45 miles from the Saskatchewan border, on a geological structure which extends into Canada.

Eleven drilling rigs are operating in Saskatchewan, nine on exploration and two on development work. Imperial has two seismic parties on exploration in Saskatchewan at present.

Alberta remains by far the most active oil area in Canada. In that province Imperial is currently operating 30 rigs in established fields, and drilled 164 development wells in the first six months of the year. Of these 162 produced oil and two were dry holes. A maximum of eight rigs has been employed by the Company in wildcatting and 23 exploratory wells have been completed. Thirteen of these, including Belloy No. 1 and Halfway Lake No. 1, both mentioned in the preceding issue of the Review, were abandoned as dry holes. Sturgeon Lake No. 1, about 10 miles northwest of Edmonton, was completed as a probable oil producer. Six wells came in as gas producers and one of them, Morinville No. 3, also found some oil in the Viking sand.

Early in July drilling was in progress on three other Imperial wildcats: Jarvis No. 2, 65 miles north and west of Edmonton, Little Egg Creek No. 1, 15 miles north of Edmonton, and at Belloy No. 2 in the Peace River district.

Discoveries by other companies this year have been chiefly in the general area of Edmonton. Two discoveries were made near Feriela, a few miles south of the Alberta capital. Of these Armisie No. 1, found oil in the lower Cretaceous formation and Terra Petroleum's No. 1, located a few miles away obtained production from the Viking sand.

Texas Wizard Lake No. 2, located southwest of the main Leduc field, found gas in the Viking sand and oil in the Cretaceous and D2 and D3 formations. Camrose No. 3, a well drilled by a group of companies near Camrose, found oil in the Viking sand.

Activities in the Golden Spike field attracted particular interest. Golden Spike, discovered in 1949, is the field that has the thickest "pay" zone found in Canada so far—extends for over 600 feet in one well. In May this year Imperial Golden Spike No. 11, a half-mile east of the field's discovery well, found oil in the D1 and D2 zones as well as in the D3 zone which is the main producing horizon in this field. The well is the first triple zone Devonian well in Alberta. It was placed on production from the D3 zone.

Month by month exploration activities in western Canada reached new peaks and in June a total of 130 geophysical parties were in the field. Of these 16 were Imperial parties: 12 in Alberta, two in Saskatchewan and two in Manitoba. Drilling by the industry as a whole also reached an all-time high; 165 rigs were drilling with 70 rigs on wildcats and the rest operating on development of existing fields.

In the first half of the year 441 development and 86 wildcat wells were completed. Of the total 365 were oil wells, 29 were gas wells and 133 were abandoned as dry holes. Wildcat drilling in search of new oil fields resulted in five oil and 20 gas discoveries and there were 61 dry holes.

Because of the wider market that was opened up when oil started to move to Ontario refineries, there was a great increase in oil production in the west. For the week ending June 19, daily average production was a record 167,004 barrels, with 2,234 wells capable of producing. Imperial's 877 wells produced 86,707 barrels of this total.

Main street of Birtle, Manitoba. This small prairie community had high hopes of becoming an oil center but Imperial's first Manitoba wildcat, drilled nearby, turned out to be unsuccessful.

Scrubbing the decks is a job as old as maritime shipping itself. Here Imperial crews string out bunks down the decks while the vessel long range from Superior to Bunka with a cargo of crude.

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Wearing life preservers, Imperial Leduc crewmen hold a lifeboat drill on the after deck as their ship sails westward into a Lake Superior sunset.