"Put your confidence in us. Give us your faith and your blessing, and under Providence all will be well. We shall not fail or falter; we shall not weaken or tire. Neither the sudden shock of battle nor the long drawn trials of vigilance and exertion will wear us down.

Give us the tools and we will finish the job."

— Rt. Hon. Winston Churchill

YOU HELP TO SUPPLY THE TOOLS FOR VICTORY WHEN YOU BUY War Savings Certificates REGULARLY

SPRING 1941 - VOL. XXV. NO. 1

IMPERIAL OIL REVIEW is published periodically by Imperial Oil Limited, in the interests of shareholders and employees. Articles, photographs and news items dealing with the petroleum industry in general are welcomed. While THE REVIEW can assume no responsibility for return of unsolicited material, every care will be taken of material while in our possession. Correspondence should be addressed to The Editor.

EDITORIAL OFFICE
56 CHURCH STREET, TORONTO
IN THE TRANS-CANADA HIGHWAY

THE LAST LINK of the Trans-Canada Highway—a 155-mile stretch between Geraldton and Hearst in Northern Ontario—will be completed this year. Crews are already at work clearing the right-of-way, building tote roads and moving in heavy road-building machinery, and the highway is expected to be ready for traffic by Autumn.

Officially designated simply as Provincial Highway No. 11, the road is one of two alternate routes planned for the Trans-Canada through Northern Ontario. In addition to closing the gap which now exists in Canada’s 4,000-mile trans-continental highway, the Geraldton-Hearst road will provide a much needed link between the two northern communities.

Likely to remain uncompleted for some little time yet is the southern route around the northern shore of Lake Superior. Pushed westward from Sault Ste. Marie as far as Montreal River, and eastward from Port Arthur to Schreiber, this section of the Trans-Canada passes through an area so rocky and well-nigh impassable that it all but broke the hearts and pocket-books of Canada’s early railroad pioneers as they struggled westward with the C.P.R. more than 50 years ago.

New significance has been added to the Geraldton-Hearst link in recent months because of the war. Completed, it will add immemorially to the Dominion’s defense by providing an all-Canadian route for the transportation by road of military forces and supplies, and for the movement of raw materials from the farms, forests and mines of the North. It is because of this that the Ontario Government has expedited this project from its wartime policy of restricted capital expenditures “for the duration.”

About 30 miles of road at the western end of the gap, said to be the largest pioneer road job undertaken in Ontario in recent years, has been roughly prepared by prisoners from Burwash Industrial Farm. Housed in three camps, the men have been employed eight hours a day cutting timber and clearing the right-of-way. Timber cut by the men is sold by the Government and each man is credited with his share of the earnings which are turned over to him when he is released at the end of his sentence.

In addition to the highway work, prisoners have carried out improvements along the shores of the many lakes motorists will pass when travelling over the new route. This is in accord with the plan of the Department of Highways to provide abundant tourist and sporting attractions for the large number of American motorists expected to visit the northland when the highway is completed.

The remainder of the route is being built entirely under contract, the work divided into 15 sections of approximately 10 miles each. Contractors are faced with the problem of transporting heavy road-building machinery into an area where no roads now exist, and upon their success depends largely the number of men to be engaged in the work. It is estimated some 2,000 men will be employed.

Those firms working on the Geraldton end of the road will be able to take in machinery over 44 miles of tote road built by the government to permit operation of trucks. Other contractors are without tote roads and must take in their equipment over the C.N.R., which runs north and parallel to the Trans-Canada Highway. This equipment will be dropped beside the railway line and tote roads will then be constructed through the bush to reach each contract area. In this way, work will go on simultaneously on the 15 contracts and when all are joined together the last link in the Trans-Canada Highway will have been completed.

Cost of the 155-mile road has been estimated at $6,000,000, or $40,000 a mile, not a high figure considering the wild country through which it is being pushed, the gullies and streams to be bridged, and the numerous lakes to be skirted.

Awaiting the first motorist to cross the Dominion entirely by car is the A. E. Todd gold medal. Held by the Automobile Club of Victoria for about 80 years, the now historic trophy may shortly have a claimant.

SPRING NUMBER • 1941

3
From the original three products of 40 years ago the Petroleum "Tree" has grown until today hundreds of products and by-products are refined from crude oil. Some of these products are shown in the "Tree" on the opposite page, and the more common uses for these are listed below.

**Branch A**
- Heavy Fuel Oil - fuel for boilers, industrial uses, De-emulsifying Agent, Saponification Agent, Acid Sludge Oil - desalination.

**Branch B**
- Heavy Lubricating Oils - Journal Oil - lubricating railway journals, Motor Oil - lubricating internal combustion engines, Cylinder Oil - lubricating steam cylinders, Valve Oil - lubricating valves of steam engines, Transmission Oil - gear lubricant, Black Oil - vacuum lubrication.
- Grease - Compassing Oil - manufacturer of heavy gauge, highly pure greases, railroad switches, greases, elevator cable greases.
- Asphalt - Steam-Reduced Asphalt - roof coating, waterproofing asphalt, insulating asphalt, Oxidized Asphalt - bituminous asphalt, paving asphalt, stellite asphalt, paint bases, mastic flooring, roofing cutouts. Liquid Asphalt - road paving, road oil, emulsion base.
- Petroleum - Salve pharmaceutical, Cream - cosmetic, Gum Arabic - pharmaceutical, Petroleum Jelly - pharmaceutical.
- Metal Coating - anti-rust compound, Lubricant - steam-engine manufacturer, Cable Coating - electrical and mining industries.
- Sodium Sulfonate - preparation of water-soluble textile oils.

**Branch C**
- Residual Fuel Oil - Wood Preservative - impregnation of railroad ties, Boiler Fuel - firing boilers.

**Branch D**
- Naphthenic Acid - Emulsifier - manufacture of textile oils.
- Lubricating Oils - Printing Ink Oil - vehicle for printing ink ingredients, Floor Oil - dust coat for wooden floors, Tempering Oil - processing of metals, Turbine Oil - lubrication of steam turbines, Motor Oil - lubrication of internal combustion engines, Cutting Oil - lubrication of saws, light engines, saws, machine tools.
- Machine Oil - lubrication of hydraulic machines and domestic refrigerators, Compressor Oil - lubrication of air and gas compressors.
- Household Oil - general purpose lubricating oil, Motor Oil - lubrication of internal combustion engines and electric motors, Boiler Oil - textile machines.

**Technical Heavy Oils**
- Floatation Oil - mining and milling operations, Switch Oil - oil-immersed electrical transformers, Cutting Oil - metal cutting, Working Oil, Coal-mine oil - lubricating, cosmetic cream, wax (cosmetic) medical purposes, egg-packets oil, fruit-packets oil, crayfish oil, hatters oil, tobacco oil, tree-sap oil, Textile Oil - lubrication of textile fibers.

**Branch E**

**Branch F**
- Naphtha Soap - laundry work, Turpentine Substitute - manufacture of paint, Clay Oil - dry cleaning, Tanning and Paint Naphtha - varnish and paint materials, Lacquer Diluent - manufacture of lacquers, Fatty Oil Solvent - degreasing and extraction processes.
- Rubber Solvent - rubber cement, Aviation Fuel - high octane aviation gasoline, Drug Extractor - extraction of drugs from medicinal plants.

**Branch G**
- Hydrogen Sulfide - Sulphuric Acid - storage battery acid.

**Branch H**

**Branch I**

**Branch J**
- Fuel Gas.
COST-OF-LIVING BONUS FOR IMPERIAL OIL EMPLOYEES

A war-time cost-of-living bonus effective March 1st, 1941, will be paid until further notice to all full time employees of Imperial Oil Limited and its subsidiaries in Canada.

The bonus is payable regardless of basic salary or wage rates. For salaried employees it amounts to $2.40 a week. For wage earners it is 6c per hour for regular working hours.

Payment of this bonus is keyed to provisions of Federal Order in Council 7440 of December 16th last which in effect ties wage and salary rates to the cost of living as established by the Dominion Bureau of Statistics. This Order in Council recognizes that wage-rate levels established in the period of 1926-29, or higher levels established thereafter, are generally fair and reasonable. As a safeguard against impairment of the standard of living by increased living costs it states that a war-time cost-of-living bonus independent of basic wage rates may properly be paid. The amount of the bonus is to be determined by advances in the Cost of Living Index prepared by the Dominion Bureau of Statistics. The bonus should be determined at intervals not more frequent than quarterly and paid in the first instance only if the cost of living has risen to the extent of 5 per cent since August 1939 or subsequent to the time of any wage increase made after that date. Thereafter the bonus should be adjusted only if the cost of living has risen by an additional 5 per cent since the last previous determination of bonus payment. It is set forth that the bonus should be decreased only in case the cost of living has decreased by 5 per cent or more since the last previous determination of a bonus.

The amount involved in this bonus payment for Imperial Oil workers is approximately one million dollars per annum and so it represents a considerable increase in the Company’s operating costs. It has been made in conformity with the Company’s policy to pay wages and salaries in keeping with a proper standard of living.

PETROLEUM SIDELIGHTS

"TANK" PLANES TRANSPORT OIL

Airplanes not only fly on petroleum, but they also carry it into areas inaccessible by railroad or truck road.

In Central America there is a mine which operates its machinery on Diesel fuel, all of which is hauled in a specially built "tank" plane from the nearest railroad.

Facilities have been built at the dock so that the plane can take on gravity flow from an overhead tank a load of 600 gallons of fuel oil.

At the mining property, which is only 20 minutes away by air, the plane taxies to an underground tank and delivers its load in less than 2 minutes. By making as many as 10 round trips a day in the busy season, the airplane is able to handle the full supply of fuel oil demanded by the mine.

NATURE SCOOPED

Mother Nature was scooped at her own game recently. It took her several hundred million years and an endless variety of materials to make coal and oil, whereas a petroleum chemist has done the job in a couple of hours!

It is too early yet to know exactly what the experiment really means, but there will be changes, and big ones, too, if he proves that all kinds of vegetable matter—such as potato, sugar, molasses, seaweed, and cotton—readily can be transformed into cooking coals, asphalt, natural gas and petroleum.

Crude oil, produced in two hours as against 400,000,000,000,000 years, could be cracked into various products, such as gasoline, kerosene, and lubricating oil. The experiment was said to indicate a closer relationship between oil and bituminous coal, which now appears to be the child of carbohydrates.

BEAUTY FROM OIL WELLS

A new technique in skin care is predicted with development of a water-soluable cleansing cream having a "straight" petroleum base. The new cream requires only moistened finger tips for application. A creamy lather penetrates the pores leaving the skin soft and smooth that foundation creams are unnecessary.

Oil derivatives in various forms have long been essential ingredients in creams, lotions, lipsticks, mascara and other cosmetics. The lighter oil derivatives, alcohols, ethers, aldehydes, acids and resins, are used in soaps. Petrolatum, derived from the heavy lubricating oil fraction of petroleum, is used in face creams. Paraffin wax is used in lipsticks.

TEMPO OF CANADA'S AIRCRAFT INDUSTRY RISES

TORPEDO bombers for coastal defence, Hawker Hurricanes and Handley-Page Hampden bombers, army co-operation planes, primary and advanced trainers, cargo freighters—more than a dozen different types of aeroplanes are now under production in Canada.

Employing less than 1100 men and turning out scarcely more than 120 planes in 1939, Canada's aircraft industry now has more than 17,000 men and women on its payroll, and a backlog of orders exceeding 110 millions of dollars. Last year more than $10,000,000 was invested in new factory buildings and equipment, and double or triple that amount may follow in 1941. As production facilities expand, new employees by the hundreds are being added.

Prior to 1939 Canada did little in the way of aero-plane manufacture. A million dollars worth of planes in any one year would have been a lot of business. Then came the war with its demand for planes—and the aero-plane industry in Canada began to assume new and greater importance.

All this expansion has not been without its problems. One of the most serious was caused by the collapse of France last summer. Most of the planes produced here were British in origin, and materials and parts were governed by British specifications. Faced with carrying on the war alone, Britain was forced to suspend shipments of materials and parts to this country, and Canadian manufacturers were like orphans in a wilderness. Canadian and American firms, accustomed to working to different standards on this continent, could not make head nor tail of British requirements, and it was
ALUMINUM, formerly used for peace-time goods, now goes into Canadian-made war planes. Photo, above, shows a sleek American Northrop Delta under construction in a plant near Montreal.

SOME CONCEPTION of the intricate construction of a modern war plane may be gleaned from this photograph showing electrically operated riveting machines operating on a Consolidated B-24 Liberator. Electrically operated riveting machines are being used in Canada to rivet the fuselage and wings of war planes.

necessary to literally educate sub-contractors to British specifications and standards before the proper kinds of parts and materials could be produced on this continent.

Today, several hundred firms throughout Canada who formerly made a wide variety of products for other than aircraft, are working to supply parts which go into Canadian-built airplanes, and, in some cases, are even shipping similar parts to the aircraft industry in Britain.

Having once "got the swing" of the way of building to British specifications, the industry readjusted itself to working more or less on its own. However, the trend will probably be toward making American-type machines since it is easier for plane makers in Canada to secure materials and the machine tools to turn out American design planes. Production of British machines, of course, will continue, but future expansion is almost certain to be closely geared with the American industry.

An event which may tremendously increase the output of the Canadian airplane industry occurred a few months ago when the Government purchased Canadian rights to the Vidal plastic-plywood process for the manufacture of airplane fuselages and wings in quantities as yet undreamed of.

A number of United States companies have been engaged for years past in experimenting with the production of moulded aircraft, and several types have been built, tested and found to stand up to all the stresses of flight. Vidal's process is considered one of the most successful. The Aircraft Production in the making of thousands of precision parts for Canadian-built war planes. Imperial Oil has been a vital part of the war effort, providing vital components for aircraft as well as other industries.

AMONG the large aircraft produced in Canada are giant British Handley Page Hampden bombers weighing nine tons. In the photo, above, the metal wing of a Hampden takes shape.

Branch of the Department of Munition and Supply is working closely with Vidal, has him building sample fuselages and intends subjecting them to exhaustive break-down tests, and at the same time the experts at the National Research Council in Ottawa are experimenting with plastic-moulded wings. The process involves thin layers of plywood, bonded together with a phenolic resin (plastic) and compressed in heat treatment to smooth, streamlined shapes in metal dies. Plastics would cut the production time on the average light or medium-sized aircraft to a fraction of the former man-hours and effect drastic savings in cost. It is quite likely that mass production plastics trainers may be used in the Commonwealth Plan by late 1941 or early 1942.

Until recently the need of the Commonwealth Air Training Plan has been for light trainer planes, and the industry has more or less concentrated on the production of planes of this type. The two largest plants engaged in building trainers are now turning them out at a combined rate of about 8 planes a day and production is well ahead of schedule.

Once the immediate demand for trainers has been taken care of, attention will focus on the production of larger and heavier craft for training and fighting purposes—fast pursuit ships of the Hurricane type, flying boats for coastal patrol work, medium and heavy bombers. Several of these larger ships already are under production, the largest built to date being all-metal Vickers "Stranraer" flying-boats with a wingspread of 85 feet, and weighing over nine tons!

MORE and more women are being absorbed by Canada's aircraft industry. Photo, right, shows women fabric workers completing wings for light trainer planes at a plant near Toronto.

SPRING NUMBER • 1941
MANY TYPES OF PLANES ARE NOW UNDER PRODUCTION


HAWKER "HURRICANE" single-seat fighter. Toes fast, hard-hitting fighters have played a leading part in holding the "flying line" against the Hun. Can fly at 335 mph and climb to a height of more than 20,000 feet.

AVRO ANSON light bomber. Used by the Commonwealth Air Training Plan mainly for twin-motor training, the Avro Anson is ideal because it spans the gap between light single-engine planes, and swift, heavy-hitting bombers. Carries a crew of three.

BRISTOL BOSWORTH medium bomber. A Canadian version of the British Beaufort, redesigned for operation on floats, skis or wheels and fitted with 480-hp for coastal reconnaissance and general defense. Carries a crew of 3 and can fly 2,000 miles non-stop.

NORTH AMERICAN "HARVARD"—a fast two-place advanced trainer used in Commonwealth Training Plan. Powered by a 220 hp "Wasp" engine and can climb to 1000 feet in the first minute. Similar to the NA-65 trainer used in U.S. Air Corps.

AVRO ANSON light bomber. Used by the Commonwealth Air Training Plan mainly for twin-motor training, the Avro Anson is ideal because it spans the gap between light single-engine planes, and swift, heavy-hitting bombers. Carries a crew of three.

IMPERIAL OIL REVIEW

SPRING NUMBER • 1941

FLEET "FINCH" primary trainer. For several years made in Canada for flying clubs and commercial schools, these sturdy biplanes are being built for the Commonwealth Plan at a rate of more than 60 planes a month. Top speed 130 mph, landing speed 40 mph.

TIGER "MOTH" trainer. A Canadian version of the sturdy veteran of the skies is being turned out for the Commonwealth Training Plan at a rate of more than two planes a day. Wings are of wood, the fuselage of welded metal tubing, fabric covered.

FLEET "VO" advanced trainer. Canadian designed and Canadian built, this swift, low-winged trainer is highly rated for its performance. Has a top speed of 191 mph and can land as low as 500 feet per minute. Body covered with metal "skins" except the ailerons.

VICKERS SUPERMARINE "STRANRAER"—a general reconnaissance flying-boat used for submarine-spotting and escorting convoys off the Atlantic coast. Has a range of 1,000 miles, carries crew of 6, and is fitted with cooking pantry and sleeping berths.

WESTLAND LYSENDER army co-operation plane. Designed especially for duties like observation, transportation of staff officers, and conveying supplies to beleaguered garrisons, this versatile aircraft can fly as low as 600 feet or as high as 20,000 feet. Carries a crew of two.

NOORDUYN NORSEMANN. Originally designed for cargo and passenger-carrying in the north country, these all-Canadian planes are finding a place in the Commonwealth Air Training Plan as "flying classrooms" for student wireless operators. Accommodate six in addition to the pilot.

—Official Canadian and British Phones.
More aid from the south

Employees of International Petroleum Company Limited, and Tropical Oil Company form “Spitfire” Funds.

Participating actively in Red Cross Work, War Savings and in the establishment of two “Spitfire Funds”, the employees of the International Petroleum Company in Peru and Ecuador, and of the Tropical Oil Company in Colombia, are setting an example of patriotic activity to their fellow Canadians at home.

The Peruvian “Spitfire” Fund originated with the employees of a British firm, Lobitos Oilfields Limited. They had started a Fund to purchase one half of a “Spitfire” plane, and asked the employees of the International Petroleum Company in Peru if they would be interested in joining them in order to make up the balance of the money needed.

The reply was instant and enthusiastic, the employees pledging themselves to donate amounts totaling $16,142.50.

Because many of the employees had pledged themselves to make up their donation by monthly subscription, the International Petroleum Company offered to advance a sum of money equal to the amount pledged, in order that the fund might be available to Britain immediately. Accordingly a cheque was sent to England from the Company.

That this patriotic effort was greatly appreciated is evident in the following extract from a letter to Mr. G. H. Smith, President of International Petroleum Company, Limited, from Mr. H. C. R. Williamson, Chairman of the Board of Directors of Lobitos Oilfields Limited:

“I received a letter two days ago, dated 26th ultimo, from your Assistant Treasurer, enclosing a Bank Draft for $3,613.5.11, being the equivalent of $16,142.50 Canadian, which amount has been subscribed by your employees at Talara and Negritos. At the same time, I received the sum of £2,000 from the British, Canadian and American staff of Lobitos.

“These two sums, making in all £6,111.5.11, I have today handed personally to Mr. R. E. Bennett, who is assisting Lord Beaverbrook at the Ministry of Aircraft Production. Lord Beaverbrook and Mr. Bennett both expressed their extreme appreciation of this wonderfully patriotic effort on the part of the employees of both our Companies in Peru.

“Lord Beaverbrook, I believe, will submit the respective field manager, and at my request is to have a reference made to the gifts in the South American broadcast at an early date.”

The employees of the Tropical Oil Company in Colombia, with the employees of the Andian National Corporation, have started a “Spitfire” Fund of their own. At the end of January, they had sent $4,850.30 in U.S. currency to the British Embassy in Washington, D.C.

These Spitfire Funds have not stopped with the initial donations, as many employees have pledged themselves to donate indefinitely on a monthly basis.

In addition to the “Spitfire” Funds, the employees of the International Petroleum Company in Peru and Ecuador and of the Tropical Oil Company.

Travelling Petroleum Exhibit Brings Story of Country’s Industry to Venezuelans.


Oil fields on tour

Cleverly combining a huge mural map done in natural colours with animated models, relief maps, motion pictures and pieces of actual equipment, the Venezuelan Petroleum Industry Exhibition on tour in Venezuela has brought the story of their country’s industry to thousands of Venezuelans.

Put on with the co-operation of the Ministry of Pomento of Venezuela, the exhibit takes visitors as though by fast moving planes on a trip over the northern end of Venezuela. Looking down on the exhibit, they can see at a glance all the way from Lake Maracaibo to the Orinoco delta. Here and there across the vast expanse of jungles and mountains, lakes and rivers, plains and swamps, the visitor glimpses oil derricks, pipelines, tank farms, refineries, tank steamers, towns, roads – all the evidence of the country’s petroleum wealth. And evidence, too, of the tremendous labour and money that has been poured into Venezuela by the oil companies to make this wealth real.

From this fascinating cross-country hop the “tourists” can make inspection trips through the industry’s varied operations and properties. They follow crude oil through a refinery and watch it transformed into familiar refined products; look down into the earth and see a rotary drill bit chew its way deeper and deeper to the hidden oil; or look on as a flowing well pours petroleum into the gathering tanks. They can follow new roads and highways built by the industry, vast comfortable oil camps (Continued on page 27)
Oil field roads have tamed the jungle of the Tropical Oil Company's De Mares Concession in Colombia.

Mares Concession, one of the world's important oil producing fields, could not have been developed.

Building the first road from the river port on the East Bank of the Magdalena to Well No. 1 of the Independencia field was a Herculean task. At first all the road clearing and grading was done by hand. The jungle swarmed with timber men wielding axes and machetes, and shovels to the explosions of tons of dynamite. Earth-moving gauges followed, using picks, shovels and wheel barrows to grade the road.

To speed up the work a narrow gauge track was laid, along which dump cars moved the excavated earth. After months of work, the narrow road was finished complete with wooden culverts and bridges.

But the engineers' troubles were not over. For the first 11 kilometers of the road, no grades exceeding 15% were encountered, but then the road suddenly descended into the "Paso del Diablo" ("Devil's Pass") on a grade of 29%, much too steep for anything but tractors to traverse. In the rainy seasons part of the road frequently was flooded.

The engineers were called in again, to take out the sharp curves and to raise the grades, and the tractor road was converted into an all-weather road over which automobiles and trucks could be driven with safety.

As the De Mares Concession was developed further, the need for road-building equipment became apparent. In 1921, the Tropical Oil Company purchased a one-half cubic yard steam shovel. As time passed more equipment was secured until today the latest and best of road-building equipment, such as bull dozers, graders, carryalls, power shovels and oil spraying machines, are pushing roads through the jungle in the quest for oil.

In all, over 330 miles of oil field roads have been built by the Company in the past 20 years. Many bridges had to be built, of which 19 of steel construction span the rivers and larger streams, while scores of smaller wooden bridges carry the roads over the creeks which cross the Concession.

The jungle isn't tamed easily. Gangs of men are constantly at work on the roads, swinging their machetes to fight back the fast-growing tropical vegetation. In the summer, or dry season, fires are a constant menace. In the rainy seasons rivers and creeks frequently rise over their banks, flooding the surrounding areas. But to the best of man's ability, the jungle of the De Mares Concession has been tamed.

In the space of twenty years' time, the tortuous mule trails have been converted to good serviceable roads over which cars and trucks pass with ease. While they cannot compare with our modern high-speed roads, these jungle highways serve well the purpose for which they were intended—providing efficient and economical oil field transportation. Where in the old days it took a good rider an entire day to travel 50 kilometres of a trail by saddle mule, autos now can travel the same distance safely and comfortably in little more than an hour.

The work of improving the road system goes on continuously. Below—A power shovel widens the road.

(Below, right) Modern tractors and earth-moving machines have greatly simplified operations for the jungle road-builder.

(Right) Combating the rapidly-growing tropical vegetation is a year-round job.
THE GASOLINE TAX provides the Provinces with more than 1/3 of their Revenues from Taxation.

Gasoline Taxes are for Calendar Years. Other Taxes are for Fiscal Years, which in most cases are not Calendar Years.

References: The Dominion Bureau of Statistics.

EACH COIN REPRESENTS 5 MILLION DOLLARS

1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

31.5% 31.3% 31.3% 31.5% 34.9% 54.9%* 36.0% 32.6% 31.3%

MOTOR VEHICLE OPERATION provides the Provinces with 1/4 of their Total Ordinary Revenue.

Motor Vehicle Revenues are for Calendar Years. Other Revenues are for Fiscal Years, which in most cases are not Calendar Years.

References: The Dominion Bureau of Statistics.

EACH BILL REPRESENTS 20 MILLION DOLLARS

1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

22.5% 22.8% 23.6% 25.0% 25.4% 28.8% 34.0%* 26.3% 24.0% 25.0%
HAVE just flown with a man who once, for more than a week, was given up for dead. His “death” happened in December, 1929, when snow and ice and howling winds were sweeping down from the Pole. Word came through that an American sailing ship was caught in the grinding grip of the ice pack off the bleak Siberian coast, some 200 miles north of the Arctic Circle. The crew urgently needed supplies and medicine.

Carl Ben Eielson, whose flight with Sir Herbert Wilkins over the North Pole to Spitsbergen had made him famous, flew to the relief of the trapped schooner. Eielson disappeared into the North and days passed without word of him. Finally, the Aviation Corporation of America in New York accepted the offer of T. M. (Pat) Reid, aviation manager for Imperial Oil Limited, to search for the lost flyer.

As their plane climbed up into the Arctic twilight from Fairbanks, Alaska, Reid and his mechanic knew that dirty weather lay ahead. But it was not until jagged mountain peaks were reaching up beneath their skin that it started to snow. Gently at first, then faster the heavy flakes dashed against the windshield until the mountains were blotted out and gusts of icy wind rocked the plane.

Finally, with the altimeter dancing crazily and visibility zero, Reid, fighting the controls, eased the plane lower, straining anxiously through the white curtain for the sign of a landing place. At any moment a mountain peak might loom up in the heavy swirl ahead. Then, through a rift in the snow, the flyers saw a narrow valley. Reid knew that the deep snow was a deceptive landing field but he had no choice. The skis touched, hit hard, and then the plane was bouncing along the ground. A wingtip, tossed by a sudden blast, dug in, crumpled and swung the plane to a stop.

A week passed before repairs were completed and the flyers could resume their journey. During that time they were unreported, as it was not surprising that the northern papers carried the news of their death.

Unaware of their supposed demise, Reid and his mechanic pushed on to Nome and out over Bering Strait, flying low. The sun, hanging just above the frozen horizon, exaggerated the shadows of piled up ice floes. The mechanic pointed ahead to a black silhouette. It was the trapped schooner. Reid altered his course but a moment later barked sharply, his eyes riveted on the ground below. He had spotted something that was casting a strangely long shadow. It was the wing of a plane sticking up out of the snow. Flying on to the ship Reid learned that Joe Crosman, a fellow flyer, had already sighted the wreckage. They enlisted the ship’s crew and flew them back. Beneath eight feet of snow they uncovered the tragic ending of Eielson’s heroic flight.

Pat Reid would be the last to tell this story. But his friends are legion and not so reticent about describing his exploits. Their testimony bears out the belief that Imperial’s aviation chief has flown over more Canadian territory than any other pilot and that his engine’s roar was the first to break the dreary silence of thousands of miles of desolate wilderness.

To fly with Pat Reid is a real thrill.

MINING COUNTRY

We had left Toronto behind, and Imperial’s trim, red, white and blue Beechcraft was now flying over gently rolling country patched over with brown and tan fields and scattered wooded areas. The first lakes appeared, their pale green shallowly clearly visible stretching out from shore to the dark green of deep water. Meandering streams snaked lazily through swamplands and when they had passed our

Night falls on a fleet of air “freighters” lined up on Lost Lake.

‘PAT’ REID.

The tale of Imperial Oil’s Pat Reid and His Fellow Aerial Pioneers in Their Conquest of Distance and Freezing Weather, Opening Up the Resources of Canada’s North Country.

The flying “freighters” of the north carry an amazing assortment—demolished Diesel engines and mining machinery, dynamite and food, beds and blankets, oil and gasoline in heavy drums, fresh fruits and vegetables, and even that luxury of luxuries—the daily paper.

SPRING NUMBER • 1941
shadow skinned out onto the blue green water of big Lake Simcoe.

After that the character of the ground beneath our speeding wings changed abruptly, and the air was bumpy. We were over glacial country, looking down on earth which had been scoured and gouged by the ice cap that ages ago had extended as far south as Lake Ontario. When the ice retreated north, it left behind the hundreds of lakes stretching in a seemingly endless chain. Through the thin skin of soil, ribs of gray rock cropped out, and here and there through the trees touched of red, orange and yellow betrayed Jack Frost's early visits. From Toronto north this system of lakes provides a series of convenient "landing fields" for planes both in summer and winter.

It was noon when the pilot pointed ahead to a great cloud of yellowish-white smoke.

"Sudbury, and International Nickel's big smelter at Copper Cliff," he explained.

We were crossing the southern edge of the fabulous Pre-Cambrian shield, the Dominion's storehouse of mineral wealth. Minutes later we could make out the towering twin stacks that mark the source of Canada's supplies of nickel, and a considerable portion of her copper, not to mention gold, silver and platinum. The nearer we approached, the more amazing was the sight of that tremendous mining and smelting plant and the thriving modern city, both rising out of the seemingly endless stretch of lakes and forests over which we had been flying. It was as though some magic carpet had dropped industry and civilization in the wilderness.

As we climbed out of the ship alongside the dock on Ramsay Lake, a little stiff after nearly four hours in the air, a youngster of about twelve ran up and declared breathlessly, "I know you as soon as you came over the lake, Pat."

Reid ruffled his tow hair. "Jimmy, your eyes are getting better every day. Some day I'll fool you and fly a different plane."

"Oh, you can't fool me. You always circle the lake before you start down."

Pat laughed and turned to greet two men who came along the dock.

"Bill, meet Bob Jenkins, Imperial's resident manager for Northern Ontario, and Frank Liddle, who does most of Bob's work. We'll let these boys buy our lunch and then take Bob north with us."

Two hours later we were 2,500 feet up and flying straight through the thick yellow smoke that poured out of the Nickel stacks. The pungent smell of sulphur filled the plane, then we were through and heading straight north for Lake Oshawooway, and a brand new gold mine.

GOLD

An hour and a half later the plane was drifting quietly up to the dock as two broadly smiling, flannel-shirted young fellows grabbed a winch and eased us in. They led the way up a rough path, past some cottages (and believe it or not) a tennis court on which two girls in shorts were volleying.

The superintendent was a tall, lean engineer clad in heavy flannel shirt, corduroy breeches and scuffed, high-cut boots topped with scarlet socks. Bob introduced him as "an educated geologist who has spent three-quarters of his life underground."

He laughingly denied Jenkins' further claim that his hat was used to muffle dynamite blasts, but did admit that he had not been "outside"—that is, away from the mine—in two years.

"But I'm going out day after tomorrow and those bright lights sure will look good."

He picked up the malignly fast and took us off on a tour of inspection. The Jerome property was discovered in 1858 by a lone prospector and was being developed by two of Canada's larger mining companies. Fifty men, a few with their families, were working the property and had taken on enough ore to make it worth while to build a stamp mill and smelter next spring.

The super bent down and picked up a piece of the heavy, grayish-white rock.

"I can't show you any fine gold. The ore's content is only one-twelfth of an ounce per ton. Which meant that six tons of rock had to be treated before they could get one ounce of gold.

Suddenly there came a strange tapping underfoot. It felt as though we were standing on a thick floor and someone underneath was tapping against the soles of our shoes with a hammer.

The superintendent laughed. "That's the blasting—500 feet down and under the lake."

The did not take much. A northwester had bent in and a sky lighter of Christine Lake Territory.

We stood for some time in the hoist house watching the thick, greenish cable wrap itself around a giant drum as it brought the elevator and a car of ore up the shaft. In the engine house next door a giant blower set the acrid wing with its steaming exhaust.

In an adjoining shack a roaring oil furnace turned drill bits cherry red for reshaping and sharpening. The super pointed to two elevated tanks across the clearing.

"Our oil and water. And you'll notice that the oil tank is larger. We burn a lot in the Diesel. We get it from Imperial, along with lubricants and kerosene for the heating stove in the cottages and

SPRING NUMBER # 1941
bunkhouses. Bob, here, ships it in as far as he can by rail and we unload it onto tractor trailers for the forty mile haul into camp."

The shadows were lengthening, and a chill wind blew off the lake as we returned to the plane. Shaking hands goodbye the superintendent pointed down to the pontoons.

"Next visit, Pat, you'll better have your skis on. So long." The propeller blasted spray across the dock and we were off for the return trip to Sudbury.

HOW BUSH FLYING STARTED

Pat Reid began flying in 1915 when he joined the Royal Naval Air Service. He served through the Dardanelles campaign, transferred to Salonica, and wound up in France. In 1918 he entered the North Sea Patrol and won the Distinguished Flying Medal. When the war ended he signed up with the Handley-Page Transport flying the first Trans-Channel service.

Coming to Canada in 1924, he flew forestry patrols for three seasons. Later he became pioneer partner in the First Air Service, and later still he started the Harnessed Airways, a flying school in Miles Canyon. He died in 1931.

The story of the oil development at Fort Norman and in the Northwest Territories is a large one; and in the following years was made the company's aviation representative.

With the return of her war pilots, Canada's commercial aviation got under way. At first the war flyers confined their activities to barnstorming. But by 1920, one man after another reluctantly abandoned the air and turned to other occupations. It was then that the Canadian lumber companies and the government began to use planes for forestry patrol and aerial mapping. Instead of battling through miles of heartbreak swamp and muskeg, sighting myriads of black flies and mosquitoes, on foot or by canoe, men could cover the same territory from the air in a fraction of the time.

As early as 1919 an Imperial Oil expedition headed by Donald W. MacKinnon had explored Great Slave Lake and Fort Norman on the Mackenzie River and at the latter point found indications of oil. There was no air service into the North then and the decision to develop Fort Norman's possibilities required tedious travel by dog team.

Here is a page from MacKinnon's diary—"Got up at 4 a.m. Temperature about 42 degrees below. Cooked breakfast, bacon, beans, moose meat, banana, tea. Harnessed Airways plane started 6 a.m. Trail badly drifted, making slow going. Travelled all day, stopping every three or four hours for an hour's rest of dogs. Had to walk ahead of team with candle in order to stay on trail. Made 40 miles by midnight."

The story of the oil development at Fort Norman and in the Northwest Territories is a long one, and in the following years was made the company's aviation representative.

FLYING THE FREIGHT

Bush flying in Canada bears little resemblance to the sleek airliners and well-equipped airports in the States. The Dominion's flying freight cars operate from "the end of steel" and carry an amazing assortment. Dismounted Diesels and air compressors, guano and oil in heavy drums, dynamite and feed, lumber, beds, blankets, roofing material, cement, foodstuffs, drills, lamps, mail house catalogues, fresh fruits and vegetables and even the luxuries of life, daily newspapers. The planes carry passengers, too, prospectors going in to that location they found last year just before they were driven out by winter, miners going out for a whirl. (Continued on page 27)

MORE AID from the South

(Continued from page 12)

in Colombia. This work has increased, rather than abated. Similar work is being carried on in Colombia. Baskets are sent frequently in order to raise money for Red Cross Work. The Colombian Oil Company employs send contributions regularly to the Red Cross in Bogota. Many knitted articles as well as other types of clothing have been sent to England for distribution to the men on active service, and for distribution by the Red Cross overseas.
BUSH FLYER
(Continued from page 22)
in the sky spied of the big cities, missionaries, writ-
er, and Mounties, sometimes accompanied by a grum
prisoner.
This dramatic development has given birth to almost unbelievable stories. One pilot, landing at Lake Windega, was told that an Indian at Rainey Lake had gone berserk and shot two men, who were desperately in need of medical attention. The near-
est doctor was at Wagazima, 150 miles away, and the temperature was 35 degrees below, and a blizzard
was on the way. The pilot took off, picked up the doctor, and then headed north through driving snow to Rainey Lake.

HE GETS HIS MAN
Pausing only long enough to drop the doctor off, the pilot and policeman took to the air on the trail of the murderous native. They spotted him, judged his course and flew ahead. The Mountie landed, and from the air the pilot watched the hunter and
hunted close. He saw the Indian lift his rifle to his shoulder, and a second later the Mountie crumpled into the snow. Without hesitation, the pilot put his ship into a dive, landed at a reckless speed and actually taxied into the fugitive knocking him un-
conscious with a blow from one wing. Then he be
hunted both men and the Indian's dog team into the plane, and flew back to Rainey Lake.

The next time you grind your battery dead try
starting a cold auto engine, think of the routine
Canada's bush flyers go through in winter flying.
Daylight is scarce and nights long, so two hours be-
fore sunrise, the pilot and his crew are usually up
and doing. The first chore is to stir up the stove
on which sit large cans of water and in them is the
full of the lubricating oil that was drained hot from
the plane's crankcase the night before. Next on the
program is breakfast, probably coffee, flapjacks
and porridge. Then one of the crew steps outside
into 40 degrees or more below zero, drapes a queer
heavy canvas hood over the plane's engine and
reaches to the ground, and inside it sets a roaring
blowtorch. By the time breakfast is over the en-
gine is nicely warmed.

A COLD TASK
Everybody pitching in to break camp, then climb
into heavy fur-lined flying clothes, fill up the oil
bunks, start the engine and inspect the plane. The
skis may have frozen so fast to the snow or ice that
even full throttle won't budge the plane. If that is
the case, some of the crew must rock the tail up
and down, not a pleasant assignment when the
propeller blasts them with a 100-mile-an-hour gale
of wind filled with particles of ice and snow. Eventu-
ally the plane gets off, and another load of freight
is on its way.

One of the more amusing stories told by Pat Reid
concerns a pilot who received a pleading letter from a
trader up on Hudson Bay. It ended: "— and please hurry along with a few bales of hay. Molly
(the horse) is kicking her stall down and eating the
splinters." A few hours later the bales were delivered.

"How much do I owe you?" the trader asked.
"You know the rate," the flyer answered, "—a dollar a pound, 400 pounds of hay—440 dollars."
The trader paid, and the pilot climbed back into
his ship, gave it the gun, but at the far end of the
lake he dug both skis into an airhole in the ice.
He trudged back to the post, borrowed Molly and
pulled his plane back on the ice. He turned to the
trader and asked how much he owed him.
The trader's eyes twinkled. "Four hundred dollars."

There are names that will live forever in Cana-
dian aviation history.—C. H. (Punch) Dickens, who
flew the first mail down the Mackenzie River from
Waterways to Ft. Simpson; W. R. (Wop) May, who
helped the Mounties capture Albert Johnson, the
demented trapper who shot and killed one constable
and wounded several others; Leigh Brinell who flew
LaGinne to Eldorado.

BUSH FLYERS' PARADISE
The passing years, of course, have brought with
them aids for the bush flyers. Fuels and lubricants
are specially made for Arctic flying, and keeps high
flying planes in touch with the ground, and
weather reports minimize one of the greatest dan-
gers of all. Despite all these improvements, bush
flying is still an exciting trade. It will be, as long
as King Winter holds sway nine months of the year
and man pushes his industries farther and farther
north.

OIL FIELDS on Tour
(Continued from page 13) and admire the modern schools and hospitals, all the
result of Venezuela's black gold. To explain what
they see a young Venezuelan petroleum engineer,
with the aid of a microphone, briefly describes all
operations and points out places of interest. Walk-
ways some three feet in diameter, they allow the various ex-
hibits insure full view of every detail.

Probably the most popular part of the exhibit
is a motion picture, shown every hour, which por-
trays the stages of successful operations, from
the geological party in the field to the ultimate con-
sumer.

SPRING NUMBER • 1941

RED CROSS ACTIVITIES AT ICCO

On the Red Cross at the Imperial Oil's ICCO Research Laboratory the Red Cross committee
with part of their work, which includes sewing
a great deal of hospital material as well as gathering clothes for
orphaned and knitting garments for the men in service.
IMPERIAL OIL SEAMEN DONATE TO RED CROSS

From out on the high seas, members of the crews of the Imperial Oil Shipping Company’s Motorships MONTREALITE, ONTARIOLITE and VANCOLITE, have sent donations to the Red Cross in Canada. To date, these donations amount to $100.00 from the MONTREALITE, $250.00 from the ONTARIOLITE and $321.00 from the VANCOLITE.

These donations were unsolicited, and these men have set a fine example to those at home in their unselfishness and generosity.

"WEATHERING" WITH OIL

Pioneer manufacturing depended to a large extent on the weather. Present-day engine aircraft manufacturers can remember the time when aluminum-alloy castings were stacked outside foundries for long exposure to the elements. Weathering drew the molecules in the aluminum together, producing a metal of sufficient hardness.

The same process is accomplished today in a few hours with oil treatment in giant vats which turn out crankcase castings superior to the old-time weathered product.

An interesting camera study of the oil loading dock at Puerto La Cruz in Northern Venezuela. One of the most modern loading docks in South America, it is the terminal of the pipe line from the Officina, San Joaquin and El Noble fields, in which International Petroleum Company is interested.