AN Ounce of Prevention

During the recent mine disaster in Nova Scotia, every available resource was placed at the disposal of those attempting the daring rescue. The latest in drilling apparatus, the finest in aeroplanes, the magic of radium, the experience of years of mining. Not the least part of this campaign was the anxious care, even the prayers, of thousands of people who were acquainted with the ennobled men except by hearsay.

The incident demonstrated that citizens of Canada set a high value on human life when it is threatened by dramatic extinction. The sad side of the story will show up later. Thousands of men and women who all night long frantically ranged the air with their radios to get the least item of news from Moose River, who discussed the progress of the rescue work and who sent uncustomed prayers whirling into the Great Beyond for the safety of men whose only claim to their sympathy was that all men are brothers, will during the next few months break every variety of traffic rule and endanger not only the lives of those they do not know and do not care about, but will jeopardize the life and limbs of their nearest and dearest.

Before a man is allowed to operate as locomotive engineer, captain of a vessel, pilot of an aeroplane, driver of a street car, a motor coach or of a transport truck, he must be thoroughly trained to handle his vehicle expertly under all circumstances. Also, his sense of responsibility is developed to an acute degree. He learns all the rules, written and implied, so well that obedience to them becomes second nature. If these men were not so trained and disciplined, if they were allowed to operate their conveyances regardless of their fitness to do so, the great travelling public would not set forth so blindly and nonchalantly on its multifarious journeys. Old people and mothers with little children would not be confidently riding trolleys and ferries. Bread-and-butter women would hesitate to commute on the suburban special or motor coach. And their fears would be justified.

Yet, with a few words of instruction and a few hours of supervision, any person over 16 years of age, who is in indifferent possession of his (or her) faculties, may obtain a license to operate, on any of our highways, a motor vehicle with all the potential destructiveness of a high explosive projectile. And about the first thing some persons do is to demonstrate, by disregard of traffic rules and lack of consideration for public safety, their total want of skill to handle the vehicles they have purchased and are licensed to drive.

The man who tries to pass traffic on a hill is taking a bigger chance than the man who descends into an abandoned mine; for he not only imperils himself but runs a fearful risk of smashing up from one to five automobiles with their load of human freight. The person who cuts in a line of motor cars allows a selfish desire to obscure the rights of others. Anyone who drives a car that is not regularly overhauled and kept in a state of mechanical safety is a menace to his fellows. Faulty brakes have caused more deaths than guns, if the truth were known.

When next you are tempted to disregard what seems a trivial traffic rule, just reflect on the idea that the "open" road is the finest testing ground the present age has devised for determining the measure of our civilization. So far it has proved conclusively that we esteem highly the rights of others and that nothing short of a catastrophe awakens us to our neglect of our responsibility to our fellow beings.
IMPERIAL OIL REVIEW

Gasoline Molecules on Parade

By Gordon McIntyre, Chief Chemist, Imperial Oil, Limited.

Illustrated by Jack McLaren

PETROLEUM was first used by man for two widely divergent purposes. It was used in religious ceremonies to bolster up the prestige of the priestly hierarchy of the Fire Worshippers. The residue of pitch, however, was put to a more useful purpose. Most of the navigators of antiquity used it to keep the water out of their vessels. For fifty centuries priest and mariner accepted nature's gift of petroleum without evincing the slightest curiosity as to its composition. For the past fifty years, however, the habits of the hydrocarbon molecule have been studied by chemists, physicists and engineers, to such an extent that we are now able to select the useful molecules, remake the mishapen and out-sized ones and reform those which may have criminal tendencies.

In our elementary school days we were told that a molecule was the smallest possible subdivision of any substance which still retained the qualities of the original substance. This was usually explained by an analogy. A cake was considered as having a certain quality which we might describe as "cakeness". If the cake were sliced, each slice would have "cakeness"; if the slices were subdivided and reassembled it is conceivable that we might finally reach a point where the particles were no longer particles of cake but individual particles of flour, egg, and other ingredients.

If we take a pure substance (by this we mean one which contains but one kind of molecule) and subdivide it, we will finally have a particle of but one molecule; if we divide this further, the molecule loses its identity and we have nothing but its elements or the building blocks from which it was originally made.

Petroleum is not a pure substance, but is a mixture of thousands of components, each of which has its own physical and chemical characteristics intimately tied up with the size and shape of its molecules as well as their elemental make-up. Fortunately the elemental make-up is simple: petroleum products are hydrocarbons whose molecules are made up of hydrogen and carbon only. The shapes and conformations of the molecules are many, but when considering gasoline molecules, only one family of molecules will be discussed for the sake of simplicity because what we say about this family may be applied also by analogy to other families. The family which we will consider is the Normal Paraffin Family. This is sometimes known as the n-Alkane family because their names end in -ane.

The family is usually lined up as below:—

Meth-ane—The baby of the family. Exists as a gas.
Eth-ane—The next step up. Still just a child.
Prop-ane—Half grown and inclined to criminal practices.
But-ane—Adolescent. Sometimes hard to control, but if surrounded by the proper elders, can become a useful worker.

Pent-
Hex-
Hept-
Oct-
Non-
Dec-
Undec-
Dodec-

Are inclined to be corpulent and somewhat sluggish for gasoline work. Can do excellent work in other fields.

The older and larger members of the family are not slim enough for gasoline but can be "cracked" or swayed down to size by proper treatment.

DISTILLATION

Petroleum consists of thousands of components. Only those in a comparatively narrow range have properties which make them useful for gasoline. It was found early in the history of chemistry that components having different boiling points could be separated from each other by distillation. This process was applied for centuries to the potable spirits industry but as our ancestors considered spirituous essence more important than corporeal transportation, it was only some fifty years ago that distillation became an important process in the petroleum industry and only some thirty years ago that distillation and gasoline became related concepts. The sorting of molecules of different sizes is best done by distillation.

These separations could never have been made if all petroleum components had had the same boiling point. If pure water is put into a vessel and boiled, the temperature reaches a definite point and stops there throughout the boiling. If we put petroleum into a vessel and heat it to boiling point we find that as the boiling proceeds the temperature must be increased. To explain this, we must use the molecular conception. Petroleum consists of different components, each one of which consists of molecules of a definite size. The small molecules are quite nimble and get away with a very slight application of heat. As the small nimble ones get away, more heat must be applied in order to move the next larger sized group of molecules and so on until nothing is left but pitch or coke.

During the simple distillation era there was plenty of crude, and the demand for gasoline, although growing,
Page Four

Persistant Propane sentenced to Polymerisation.

Page Five

Nemesis!

In the assimilation of molecules of various sizes and shapes which go to make up gasoline; the process is too large and some are too small to fit into the comparatively narrow range which we want in gasoline. The first thing we do, therefore, is to shake out the ones of proper size and put them to one side. This we do by distillation. The oversized molecules are then dealt with drastically and made to conform. This is done by cracking. The under-size molecules are criminals; they kidnap the gasoline molecules and attempts to run away with them. This criminal procedure is frustrated by the absorption process. Finally, we pursue the criminals themselves and by proper treatment some of them can be reformed or polymerized into honest gasoline molecules.

We have shown that the molecules which we find in gasoline are not arrived at by chance, but are discovered by the intelligent application of the principles of distillation, cracking, absorption, and polymerization.
EDMONTON—THE GATEWAY TO THE NORTH

Few enterprises have attracted more wide-spread attention than the mining activities in Northern Canada, particularly the development of the North-West Territories. That vast expanse of country which only two decades ago was considered too remote to contribute materially to Canadian prosperity for at least another century is now, thanks to the aeroplane, only a day's travel distant from the progressive civic centres of western Canada. In the short space of twenty years the “Far North” has become the “Near North” whose ever-increasing population enjoys most of the comforts usually supposed to be the prerogative of city dwellers.

The gateway to this region—nearly one-quarter of the total area of Canada—is Edmonton, the capital of the Province of Alberta. Established as a fort and trading post in 1795, this ambitious community has become the wholesale distributing centre for 75,000 square miles of territory comprising the upper valley of the Saskatchewan and the great drainage basins of the Athabaska, Peace, Slave and Mackenzie Rivers. Comparatively close to other great centres—300 miles from the international boundary, 270 miles from Vancouver and 800 miles from Winnipeg—and served by two transcontinental railway lines, Edmonton needed but the addition of air service to consolidate the work of its pioneer citizens in establishing contact with and furnishing supplies to the entire north country, even to the shores of the Arctic Ocean.

The city is fortunately situated. Under the surface of the district lie rich beds of lignite and bituminous coal at a convenient depth to be worked easily. For a radius of over 100 miles in all directions the soil is a fertile black loam unsurpassed for agricultural purposes as evidenced by the fact that farmers from around Edmonton have many times won the highest awards in international grain growing competitions. Luxuriant pasture lands and an abundance of water provide excellent facilities for live-stock raising.

Edmonton citizens are not content with past achievements and circumscribed horizons. They look far into the future and prepare for coming events. Outstanding proof of their foresight are the airports. Nor for nothing has Edmonton been dubbed the most air-minded city in Canada. Back in 1919 when most of us considered the aeroplane an interesting, somewhat impractical object, remotely useful in case of war, Edmonton set aside for use as an airport a tract

of land 300 acres in extent. Schools of flying were opened and the Edmonton Aircraft Company erected a small hangar. Two years later this hangar was purchased by Imperial Oil Limited to house the two Junkers' planes which made the historic first commercial flight to Fort Norman, over practically uncharted territory.

In June, 1926, Edmonton Airport received its license, the first issued in Canada. By 1930 a modern hangar was erected, the field properly levelled and marked, night flying equipment installed and the airport given Class A rating.

Air traffic through the "gateway" increased to such an extent, especially during the summer months, that it became necessary to provide a summer landing place. A location was selected at South Cooking Lake, 19 miles south-east of the municipal airport, and in cooperation with the citizens of Edmonton the Dominion and Alberta governments proceeded to build there a land and sea "plane base. This base has a large slipway for loading and unloading, a passenger wharf and adequate fueling facilities similar to those at the city airport. There is a workshop where a crane and other machinery take care of the change-over from wheels to skis, even on the largest aircraft, and where minor repairs can be effected. An attractive hotel accommodates crews anxious to get off to an early morning start "down North". An open fire provides cheerful warmth as the returning crews fill in long reports and log their trips. Comforts seldom enjoyed as they swoop swiftly over aerial trails—shower baths, soft beds, blankets provided at the hotel. And aircraft companies and operators are gratified to know that at Edmonton's Cooking Lake Airport passengers and freight expeditiously discharged, their frail and expensive craft can ride off, shore in a sheltered bay.

Edmonton's seaplane base provides safe anchorage for bush aircraft.

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Checking Up on the Aerial Camera

By Lieut-Col E. L. M. Berns O.B.E., M.C.

What on earth, most of the Review's readers will exclaim, is a Stereogoniometer? It is a machine invented by Dr. Fourcade of South Africa, one of the pioneers of photo surveying and who is responsible for its name which means, literally, an instrument for measuring solid angles. The Stereogoniometer is used to facilitate the economical and precise utilization of air photographs.

For centuries the greater part of Canada's riches have lain untouched in regions which until recent years could be reached only after months of hard travel by dog sled and canoe. The aeroplane, besides facilitating transportation to these regions, has provided a way for making in the space of a few hours a permanent record on photographic film of the topography of these formerly inaccessible areas.

The advantages of aerial photograph survey are obvious and up to the present copious use has been made of air photographs for extracting general information about material resources and for making small scale maps without showing elevations. A small amount of accurate mapping has been accomplished by laying out the work on the ground. Air survey, by the way, seems to have been made to order for Canada, for when winter calls a halt to ordinary survey operations the surveyor who has spent the summer on air photography and ground work can utilize the winter for plotting maps and compiling the information gathered during the summer.

An uninformed person looking at a "vertical" air photograph—one taken with the camera pointed vertically downward from the aeroplane—probably considers it an exact equivalent of a map or plan. But of course, greater detail. The vertical air photograph, however, is not a map because it has certain grave defects from the surveyor's point of view. For example: an object vertically above another has the same horizontal position and in a true map or plan is plotted on the same point. An air photograph does not fulfill this essential condition. This is illustrated by Figure 2.
The buildings marked A and B in the upper left-hand corner are the Bell Telephone and the Royal Bank buildings in Montreal. In this photograph these are seen in perspective, roof, walls and foundation all occupying different positions on the plan. Difference in elevation in this case has resulted in a difference in plan position, the higher points being distorted outward from the centre of the photographs. Houses not so high and closer to the centre of the photograph are nearer to a plan representation, but distortion due to height, although more apparent in the tall buildings, also exists in the photographic images of all other objects rising above the general level of the ground.

The result is that an engineer making plan measurements on an air photo such as Figure 2, and not knowing the relative elevations of different points, is unable to establish the true distance between those points. Most of my readers have seen the air photo mosaics produced by joining together a number of air photos to make a picture of a very large area. If the area is a hilly one, a close examination of the mosaic will show that where the photographs join, roads, streams and similar details lose continuity. This, of course, is due to distortion caused by the different elevations combined with the effect of tilt, another difficulty in the way of air mapping. As more photographs are added, it becomes still harder to make them fit, gaps appear and a representation of the ground is hopelessly inaccurate.

Tilt may be defined as the deviation of the camera from true verticality at the time of exposure. The surveyor on the ground working with a theodolite is guided by the spirit level but the air camera operator, owing to the motion of his plane, has no such means of keeping "on the level." Even with the aid of the gyroscope it cannot be accomplished and therefore some tilt is sure to be in every air photograph. How much or in what direction it lies cannot be determined by mere inspection.

To get a clearer understanding of the effect of tilt, let us look at Figure 3, an extreme case. The photograph is so much off the vertical that it shows the horizon. This type of photograph is usually known as a high oblique. The image of the horizon (emphasized by a black line) enables the surveyor to calculate the direction and the amount of tilt which, combined with the altitude of the aircraft at the time of exposure, allows him to draw a perspective grid on the photograph. This grid simply represents imaginary lines forming squares, one mile to a side, on the ground. Note that in this photograph the scale grows smaller passing from the lower to the upper part of the picture and that instead of a square on the ground showing as a square on the photograph it appears as an irregular quadrilateral. When the tilt is small this fact is not so easily perceptible and adds to the perplexities of the map maker.

How then can we overcome these inconvenient characteristics of air photographs, height displacement and tilt, be overcome?

Suppose that it were possible to replace two cameras containing developed negatives at the same points in space and at the same tilt they occupied when those same negatives were exposed, as in Figure 4. Then if lines are drawn from an object "O" on the ground through each of the lens-centres "S" and "T," they will continue to the focal plane of the camera and fall where the image of the point "O" appears on the negative (small black dots) and, conversely, if the lines were produced from these images through the lens-centres they would meet at the object on the ground. This holds true for all objects and images in the picture.

Now suppose that instead of trying to put our cameras and negatives back into their original positions in the air we could put them into a machine which would accomplish the same results and so build up a model of the photographed area in which all points would be correct in plan and elevation. Tilt would be overcome, and the effect of distortion due to height instead of being a hindrance would enable us to perceive relative heights and to measure them. This idea occurred to surveyors and instrument makers several years ago and much ingenuity has been exercised in inventing and constructing dozens of such machines with names in most cases as long and dismaying as Bouguer's Stereogoniometer.

![Figure 3](image-url) In this "high oblique" photograph the scale grows smaller passing from the foreground to the horizon—the effect of tilt.

![Figure 4](image-url) Shows the relationship, at the time of exposure, between the two cameras and the object photographed as reproduced in the Stereogoniometer, thus overcoming tilt and utilizing the effect of distortion.
Perhaps some of my readers remember the parlor stereoscope so popular in the 1890's. If they do, it will help them to visualize one of the main principles of the Stereogoniometer—an optical system which enables the observer to view both photographs at the same time, sighting images on each photograph by an appropriate aiming mark. By viewing one picture with each eye a stereoscopic impression is conveyed to the brain and the observer sees the ground in clear relief. Complementarily to the optical system is a mechanism in which two rods are made to take positions parallel (or in some other geometric relation) to the line of sight from the centre of the lens to the image on the photograph. The point of intersection of these rods fixes the position of the point of detail viewed. These principles are illustrated in a sketch of the Stereogoniometer Plotter, Figure 5. The lines of sight go from the binocular eyepiece through various prisms and lenses until they are reflected from the mirrors up into the camera frames “A” and “B,” in which the photographs are held. The rods “E” are so arranged that they move the camera frames and mirrors so that the line of sight passing through the lens in the camera frame bears a definite geometric relation to the direction of the rods. The equivalent point of intersection of the rods defines the position of the point of detail sighted on.

Setting the photographs in the plotting machine in the same position relative to each other and to the same reference plane as they were at the time of exposure involves knowing the tilts of the photographs and their position in space. This information may be deduced from the photograph itself in a roundabout way. It is in what he has done towards accomplishing this that Dr. Fourcade has made such a big forward stride. He was the first to realize the practical advantages of using the air-base line for reference instead of the horizontal plane customary in ordinary surveying, and practical experience has proved his theory. The motions of the machine he has designed provide the simplest means yet found for restoring two photographs to their relative position at the time of exposure. He has also found a simple geometric criterion for determining when two photographs are correctly oriented.

Air photo plotting machines have been in use in Europe since soon after the war and are being adopted by more and more countries such as Portugal, Roumania, Chile, Colombia, and Peru, countries on which some Canadians are inclined to look somewhat patronizingly in matters of technical development. But Canada has fallen behind in this newest branch of the art of survey. This backwardness is all the more regrettable when we recall that Dr. Deville, the late Surveyor General, was one of the world pioneers of photographic survey.

For this reason, the fact that Imperial Oil Limited has made it possible for Canada to acquire a Fourcade Stereogoniometer Plotter for experiment and research will elicit the heartiest appreciation from members of the surveying and engineering professions. This machine which is being built by Barr and Stroud, the well-known instrument makers of Glasgow, Scotland, will be used by the Geographical Section, General Staff of the Department of National Defence, in collaboration with the Survey Research Committee of the National Research Council. It is to be hoped that by means of this machine which is designed on principles theoretically superior to any other existing we shall be able before long to recover some of the ground and prestige we have lost.

A WELL was to be drilled at a point 33 kilometers, roughly 21 miles, northeast of El Centro, the hub of the Tropical Oil Company’s producing operations in Colombia, South America. Preparations began in January, 1935, and by the terms of the contract between the Colombian Government and the Company, the well had to be spudded in by the first of September that same year. To one unfamiliar with local conditions, eight months would seem to be ample time for starting any number of wells, but that in charge of the work realized that a large undertaking was ahead. Thirty-three kilometers of unbroken jungle, wild as any that ever served as a setting for a tropical novel, lay between El Centro and the proposed Lisana Well No. 1, at the foot of the eastern range of the Andes.

The geologists and engineers who had traversed the few trails by mules and afoot reported that the intervening country was full of treacherous swamps and of streams that became rivers after the torrential rains. Obviously it would not be possible to move in by mule transport the drilling machinery, camp equipment, and all the other materials needed for the drilling of a well.

Three methods of transportation were considered: the land route, the water route and the air route. To the right of way out of the unmapped jungle, build bridges, fill swamps and grade a road to the well site for the transportation of materials, the building of camps, the establishment of a water supply and electric, medical and sanitary facilities, a food and material storage—in time to allow for rigging up and spudding in a well within eight months—would be a gigantic task.

Although seemingly fantastic, transportation by aeroplane was quite feasible. By clearing landing fields at El Centro and the well site, it would be possible to transport materials and machinery, piece by piece, to the well in large aeroplanes. Similar undertakings had been successful in Chile and the East Indies. But the dangers of this method were apparent, particularly in view of the time element involved, and the idea was abandoned.

The water route would follow down the Magdalena River to the mouth of the Sogamoso River and thence up the Sogamoso to a point near the well site. A road
IMPERIAL OIL REVIEW

On January 21, 308 workmen, under nine labor contractors, began felling timber for the start of the road at Athabasca. By the middle of April the force was increased to 900 workmen, and 12 kilometers of road had been opened for traffic. Work was progressing on 12 additional kilometers to the half-way mark and the engineers and chainmen were about making preliminary surveys and setting stakes for clearing the grading of the remaining 24 kilometers, which were to be conducted under the supervision of Engineer Jorge Villas for completion by smaller contractors.

The system of performing the work by small contractors was found to be singularly effective in the enterprise. Each contractor, in charge of approximately 90 men, was paid, for distribution among their men, a fixed amount per acreage (100 square meters) for clearing the roadway. This gave the contractors and their men the incentive to complete the clearing in the quickest possible time, so that the work was thereby much more speedily accomplished and the workmen better accommodated than a fixed daily wage had been paid.

By the time work was begun on the second half of the road, the number of laborers had increased to 800. To provide quarters, food and medical attention for this army of workmen was no small undertaking, particularly when it is considered that the great majority of these men were working up ahead where they could be reached only by mule or horse. A field hospital was established in Camp "Zaral" at Kilometer 34, the half-way mark, with a staff doctor in charge, and "penicillium" (practical name) was stationed at the other camps along the route. Severe cases were taken to El Centro hospital for treatment. Those in charge of the construction work are to be especially commended for the very satisfactory health record established, for the excellent sanitary condition of all the camps, and for providing an abundance of good food for this army of workmen in the jungle.

Dr. Alfonsino Callejas and El Chacho inspecting the first bridge timber placed at Pardesí Creek.

A road would have to be built from this point to the well location. A thorough survey of the upper waters of the Sagamomo, however, proved that there was insufficient depth, even during high water, to allow for the draft of the river boat and barges that would have to be used.

A road would have to be, then, by what route? Only the incidental reports from geological and engineering parties gave any indication of the terrain to be traversed.

The Resident Manager, P. F. Shannon, knew who could be depended on to supervise the work of putting through the best road in the shortest time. This person was E. H. Austin, Chief Engineer of the Tropical Oil Company, who had built all the roads on the concession for the past fourteen years and who in 1931 and 1932 had supervised the Company construction of 42 kilometers of the San Vicente highway through the same country for the Department of Santander. Six Colombian engineers were added to the regular engineering staff, most of them graduates of the Medellin School of Mines. All of them worked with the regular staff on the problem of location of the road.

During January, various routes were considered and several appeared feasible until some major obstruction—generally a large swamp—intervened. A practicable route was finally discovered, leading north from a place called Albinas on the San Vicente Road. Albinas, 17 kilometers distant from El Centro, could be reached by motor, but the remaining 48 kilometers (90 miles) of country stretching between Albinas and the well site was unexplored. By this route, the larger swamps were avoided, but the jungle here, if anything, was more dense, and the broken nature of the terrain would tax the resources of the engineers in providing a road that would not exceed the limit of expense on curvatures and grades.

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The system of performing the work by small contractors was found to be singularly effective in the enterprise. The contractors, each in charge of approximately 90 men, were paid, for distribution among their men, a fixed amount per acreage (100 square meters) for clearing the roadway. This gave the contractors and their men the incentive to complete the clearing in the quickest possible time, so that the work was thereby much more speedily accomplished and the workmen better accommodated than a fixed daily wage had been paid.

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What a scene of feverish activity would have met the eye of a tourist traversing the trail from Athabasca to the well site during the first part of June! Steam showboats, "iron Mules" (dump trucks) and graders were clearing part of the road on one and while gangs of men with their axes and machetes were clearing the side of the road at the camp. And in between, bridges were being constructed, camps being moved, trees down, or reconstructed, long lines of pack mules were constantly coming and going with provisions and materials, and the noise of this activity was accentuated at intervals by loud blasts of dynamite in stamp teornouts which would set the monkeys chattering and bring loud squawks of disapproval from giant macaws and dozens of green parrots.

As the night settled down with its unclouded stars, the myriad of insects, the roar of motorcycles, and birds provided an unexciting trumble while the rustling of the jaguars and the musculine waists of the giant sloths took ample care of the bare.

Add July 12 the first automobile crossed the road from east and end and arrived at the well site just ahead of two trucks bearing material for the denitril for and for the camp water pump at the well. Transportation to the well was now established, and although much remained to be done before spudding in the well, those in charge of the road construction would never lack for activity.

On August 11, exactly seven months after the first work was started, the road was completed, and nine days before the expiration of the time limit, Licencia No. 4 was spudded in.

Storage at mile 8, kilometer 6. The mulch are loaded into the road to prevent them sinking and taking side cuts on each other when passing on the road.

Storage at mile 8, kilometer 6. The mulch are loaded into the road to prevent them sinking and taking side cuts on each other when passing on the road.

Looking Forward

From George Rainey to, now residing in Scotland, comes the following letter, inspired by the story of Tom Murray in an edition of February-March issue. He was the man who gave Mr. Murray his start in the oil business.

FRM

A number of years I have received, at regular intervals, a copy of your humorous, Oh, Rainey, you don't have to worry about the names. I want to express my sincere thanks and appreciation of your kindness in providing me with the "Terror" magazine, which not only gives information as to the continued progress in matters pertaining to the oil industry but also contains personal notes from various sources.

These features are especially of interest to me when articles appear regarding the International Petroleum Company's oil fields in Peru. As it was general manager there from 1907 until 1913 and can realize the progress which has been made since that time. I note also, with great satisfaction, that the conditions of living have vastly improved for the native population as well as for others.

Looking back to 1907, it was difficult then to do all that one desired as it was necessary to practice rigid economy and this will be understood when I state that the Company was shipping, in their tank steamers, most of the crude oil produced in the field at the price of thirty dollars per ton, delivered at its destination, and refined products were sold in small quantities as they could be produced. Matters improved as production increased and later we shipped crude oil to California and also augmented the sale of refined products.

The Company built and equipped a small hospital and gave the native children better opportunities for acquiring education.

The vision I then had was of Talara as the centre of a large refinery, with a supply of fresh water from the river China in place of the unsatisfactory and expensive sea water distillation, and the fact that both of these advances have become realities is of assurance to me.

I am indebted to Mr. Alexander Fleming, who was with me in Peru before going to Toronto, for making the request to furnish me with your Magazine and I am glad to see in it the names of some whom I knew; in the last number I note with pleasure that Tom Murray is well and doing good work.

My sincere thanks and good wishes for the future of the International Petroleum Company and for the well-being of all associated with it.

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THE CONQUEST OF THE JUNGLE

SCENES taken in the oil fields of the Tropical Oil Company in Colombia, South America. That Company began to develop the property in 1916 and now on these concessions where once the jungle reigned supreme are excellent roads, bridges, railways, pipe lines, oil wells, refineries, storage tanks, camps, stores, dwellings, schools, hospitals and club rooms. The Colombians have been trained as workers in practically every department and handle their tasks with efficiency and dispatch. Needless to say, their living quarters are comfortable, their wages good and facilities are provided to make their hours of recreation more enjoyable.

Drill pipe is rushed to the well locations and steam boilers are installed to provide drilling power.

Oil is reached. The Colombian drillers have done a good job, and they move while the storm rages and the rain pours down from the sky.

Band wheel and crank lift the precious crude many hundreds of feet to the surface.

High above the drillers tower the derricks. The rotaries spin and the bits bore deep into the earth.

The last of the muddy water flows out, a grey fountain against the bright greenery of the jungle.

A central power, built by local labor utilizing discarded drilling material, pumps several wells at once.

Toil dresses keep the bits sharp and in good shape. These men, handsomely and expertly handling the white-hot steel, are Colombians.

Then, with a roar, the thick columns of oil leaps toward the sky. Soon the stream will gush in the flat impetus on its way to the refinery.

This system of multiple pumping lines radiating from a central power is said to have been first used near Petrolia, Canada.
ON THE ROAD TO HEALTH

The Saskatchewan Junior Red Cross Hospital, located in Regina, is the only children's hospital in the Province. The ambition of the Junior Red Cross and its tens of thousands of boy and girl members in Saskatchewan was realized in February, 1926, when the hospital was completed and opened for the treatment of children whose parents are unable financially to provide for the necessary surgical treatment and hospitalization.

During the ten years of its existence more than 3,500 cases have received treatment, most of the patients being crippled children. The number of cases is hardly a criterion of the extent of this institution's work, as many of the children are in the hospital for several months or, in some instances, over a year. Some truly pitiful cases have gone through this small hospital, children afflicted with infantile paralysis, spinal curvature, club foot, some with terrible burns, the result of accidents.

The hospital has three main wards containing 28 beds, all bright and tastefully decorated with frescoes depicting nursery rhymes. There is a small operating room. The building has no steps but a sloping ramp has been built instead so that little patients in wheel chairs can be easily taken out for an outing and so that those using crutches or lame will not fall as they might do if there were steps to climb.

This hospital is under the direction of Miss Jean MacKenzie and it is good to know that everything done that loving kindness can do. Cases that other institutions, for one reason or another, cannot take are made welcome in the Junior Red Cross Hospital. Many of the children leave completely cured, while the condition of the others is always improved.

The hospital is supported entirely by voluntary subscriptions, the chief source of revenue being the funds subscribed by the school children of Saskatchewan working through the organization of the Junior Red Cross. During the famine years, when the drought struck Saskatchewan, several districts experienced crop failures for five successive seasons. The hospital went through a trying time, but no child was ever turned away. There is no grant of any description from the Provincial Government, city or municipal bodies. Outside help, therefore, is welcomed and the donation of an electric refrigerator and two up-to-date ovens, made possible by the proceeds of a bond issued by Imperial Oil employees, was greatly appreciated. The hospital's refrigeration has been totally inadequate to the demands made upon it, and additional ovens were sorely needed.

Those Imperial employees who contributed to this fund collected for just such humanitarian uses will be pleased to know that they have aided in a wonderful work which gives less fortunate children brighter outlook on life and a reasonable opportunity to become healthy, self-supporting Canadian citizens.

THE CRUISE OF THE HORNET

By T. M. Reid, Imperial Oil Limited

From current statistics we learned that in 1935 mining ranked as one of Canada's leading industries with a production of $110,000,000 and that the amount of roller freight moved into the mining areas by air had increased from 4,000,000 pounds in 1933 to 14,000,000 pounds in 1934 and to 36,000,000 in 1935.

Our curiosity was aroused. We became ambitious to visit the country capable of producing so much wealth and to see the place where the aeroplane is regarded simply as a piece of equipment designed to transport people and things and where its arrival causes no more stir than do the regular trains of railway trains and motor transports in the more settled parts of the Dominion.

To achieve our ambition it was necessary to resort to the favorite Russian pastime of "making a plan". This was to hire from the De Havilland Company a Hornet Moth aeroplane equipped with skis and tour the various air bases and mining camps throughout Northern Quebec, Ontario and Manitoba. At the same time we would test, under operating conditions, Samia Refinery's latest production—Stanaway Aviation Oil 50 Special, an oil designed to eliminate to a great extent that light wear of winter flying operations in the north, the draining and pestering of oil and engine.

Our plan was approved. Gordon Scott, industrial engineer for Toronto Marketing Division, was elected to look after the minor end of the business and the "expedition" was assembled at the De Havilland airport on Friday, March 28. Having convinced Gordon that because he weighed 10 pounds less than the weight limit he was not entitled to take along 10 pounds more baggage than ourselves, we finally got our load down to regulation weight, took off and headed for the great open spaces at 11.20 a.m.

Cruising along comfortably at 4,000 feet we arrived at Sudbury some four hours later, having backed a fairly strong head wind most of the way. We stopped at Sudbury overnight and had the pleasure of meeting Phil Sauve who operates the air base for Capreol and Austin Limited. That air base is certainly an oasis to transient airmen, and the word "oasis" applied to winter flying in Northern Ontario indicates warmth, a hearty welcome and willing, efficient hands to tend the aeroplane. It is not to be confused with a few
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palm trees somewhere in the middle of the Sahara. While we there we also met Ben Claggs who operates an air service between Sudbury and the Alberta mine for the Consolidated Mining and Smelting Company. Ben keeps the mine supplied with equipment, dynamite, good food and cooks—indeed everything that's wanted in a hurry and that will go into his machine. A crucial moment occurred next morning. We had told the boys at the base that it was not necessary to drain the oil, to cover or to preheat the engine of the Horntet and we arrived at the scene of operations in a state of jubilation lest our theories regarding low pour point, high viscosity index oils might not work out. When aeroplane engines have been standing idle in low temperatures the oil congeals and causes piston and valve rings to adhere to the cylinder walls. The usual procedure is to place a tent-like cover over the engine and thaw the oil with a blowtorch—thereby avoiding the unnecessary work of mixing which is necessary. Aeroplanes come to an untimely end, usually as the result of a few drops of gasoline or oil getting to the flame of the blow torch. Testing the Horntet's propeller we found that it moved quite freely and to our great joy the engine started at the first attempt, giving a perfect demonstration of the advantages of using Stanavo 60 Special.

Our next boarding place was Sault Ste Marie, particularly noted as the headquarters of that brood of flying merchants, the Ontario Provincial Air Service. Under the efficient direction of George Ponsford they patrol and protect the forest reserves from Sudbury to the Manitoba boundary. In their hangars and workshops, during the winter, the machines, engines and instruments of the fleet are completely dismantled, inspected, overhauled, re-assembled and tested by skilled specialists so that when they leave for their bases after break-up each machine is equipped to meet the demands of the most strenuous fire hazard season.

Our stay in the Soo was prolonged four days by squally weather and although our machine had been left exposed to extremely low temperatures it was started without difficulty the following morning.

Leaving the friendly Soo behind, we had a pleasant and uneventful flight as far as Massey where we were forced to land on the Spanish River because of a storm and poor visibility, thereby providing an object of interest for local children and grown-ups who flocked to the river to get a close-up view or a snapshot of the Horntet.

In a couple of hours the weather cleared and we were once more on our way. Stopping at Sudbury just long enough to refuel the aircraft and ourselves, we flew over to the Alberta mine situated in the heart of the Timagami white pine reserve. Here Gordon spent a couple of hours discussing technical problems pertaining to the operation of mining equipment, after which we headed for Hailshamery, landing on the frozen surface of Lake Timiskaming. After landing, the strong wind made taxiing difficult, so Gordon got out to assist by hanging onto one wing tip. As his feet were not visible from the pilot's seat he did not seem to be moving very fast as he trotted alongside holding onto the wing, so we speeded up the engine slightly and quickly covered the last half mile to the base inside the harbor. On getting out of the machine we were surprised to find Gordon in a state of semi-exhaustion and when he had recovered sufficient breath he abused me soundly for five minutes and said I had run too fast as since he'd left school or was overset, we forget which.

The next morning we experienced our first disappointment. The engine refused to start without preheating. However we discovered this was due to the impulse magneto mechanism becoming sluggish and failing to give a proper spark. Stanavo 60 Special was vindicated.

Leaving Hailshamery, we flew to Noranda, lunched, and took off again for the Beatty mine. There Gordon expounded the superior qualities of the new Imperial Rock Drill Lubricant to Mr. Rosal, the "drill doctor," who attends to all the pneumatic rock drills when they get out of sorts or are otherwise indisposed to work.

On the way back to Noranda we dropped in at the Sturgeon mine and were very hospitably received by an old friend, Clare Conners. Next day we flew to Senneterre. From this point Fred Bone of Canadian Airways Limited had just completed a freight contract which included the transportation to one of the mines of such items as a complete steam boiler, 16-foot lengths of railway line and several tons of heavy mining machinery and equipment, the last cargo of the world one would expect aircraft to be capable of transporting.

From Senneterre we flew to the Sullivan mine on Lake Montigny where we found that landing would be difficult due to newly fallen snow and an overcast sky. The approach procedure under such conditions is to fly close to the shore and gauge the height of the aeroplane above the snow, from objects on the shore or to land with just sufficient engine to maintain the aircraft in the controll. We chose the latter alternative and to our great dismay found that we were travelling across the lake about 20 feet in the air with our aircraft almost stalled one instant and climbing rapidly the next as we joggled with roughness and joltiness. After covering about two miles in this unorthodox fashion we came to rest in a series of bumps which dispelled any doubts as to the safety factor of the Horntet's landing gear.

From Sullivan we travelled by motor to Shawky, Green Stubbell, Sigma and Lameque mines. En route to them we passed through Quebec's newest mining town, Val d'Or, where everyone was busy constructing houses, stores, etc. One day they see a lot of people saving wood and hammering nudes and by the next day such places as the Palladium Royale Hotel, the Bijou Theatre and the Universal Department Store have sprung up like mushrooms. Already Val d'Or has its own newspaper and we have no doubt that the town's inhabitants are being entertained nightly on bridge and afternoon tea than on the ancient and honorable mining town pastimes of drinking moonshine and shooting crap. Such is progress.

Bourlamaque, a few miles east of Val d'Or, is the company-built town of Lameque Mines Limited. Unlike similar towns which like Topsy "just grew", Bourlamaque came into being in accordance with a scientifically and artistically conceived plan. Its streets are properly laid out, all homes are solidly built and well designed, while a complete and modern business block caters to the needs of its citizens. That afternoon we flew over to the Sticeau mine, on an island in the middle of Lake Montigny, and then back to Senneterre. The next morning we headed down the track to Osclerario, where we found the Canadian Airways just about to leave for Chiougoujau with a lumber machine and one of our more remote ports of call, lying across

unsettled country, we beseeched him to hold his horses until we put a crew aboard in the Horntet when we'd stick to him closer than a brother. Besides being unfamiliar with the terrain our emergency equipment was limited to one ax, a box of matches and a pair of snowshoes and, in the event of a forced landing and a walk back to civilization, the arrangement was to split the box of matches and draw to see who should have the snowshoe and who the ax. This way we would make the best time, it being tacitly understood that whoever won the snowshoes was to break trail and keep well ahead of the axman if he wanted to hang onto the snowshoes. So we felt much better with a great big Junkers hovering alongside to see that we didn't stray from the straight and narrow nor fall by the wayside.

Finally we arrived at Chiougoujau, the property of the Consolidated Mining and Smelting Company. A complete mine shaft equipment is installed there, including hoists, cable, boilers, engines, etc., all of which was delivered by air from Osclerario. Here, too, are modern counterparts of Pegasus in the form of a team of very fine oxen which had been flown to the property. We spent a pleasant couple of hours with H. G. Gage, the mine manager, while our escort, the Junkers, moved a complete diamond drill crew to a new location. Unfortunately when he returned for us, there was a sticky condition of the snow we had to make two turns before we succeeded in getting off and our escort had almost disappeared before we were in the air. We finally caught up with him and arrived back in Osclerario just before dark.

During the next two days we were grounded on account of fog and rain. We discovered in that time how efficiently the interests of Imperial Oil are looked after in Osclerario by John Millidge and Son. The future of Osclerario is in even more efficient hands than that of Mrs. John Millidge and we expressed our appreciation of that good lady's cooking in no uncertain terms.

Our next flight was back to Noranda where we were very capably looked after by the staff of General Airways Limited. From there we flew across to Timmins where Gordon visited all the mines in the area. Here, through the good influences of Duke Schiller, who flies for the McIntrye Porras Company, and the courtesy of the mine manager we were taken
underground 3,500 feet. Being underground in a modern mine is a wonderful experience. While we were particularly struck with the precautions taken to ensure their safety and well-being, we still have the greatest admiration for the courage of the engineers and miners who wrest the gold out of the depths of the earth 5300 feet below its surface. Frankly, we were quite relieved to be above ground again.

One of the most enjoyable flights as far as weather conditions were concerned was our trip from Timmins to Long Lac where we stopped just long enough for gas and a pleasant lunch with our old friend George Reesor of the Forestry Branch and were off again to Little Long Lac Mine.

As soon as we landed there we realized that the snow was pretty soft and only by keeping the engine running full out were we able to get within 300 yards of shore where the Homet finally dug her skis out of sight and quiet. Off steering the engine nonchalantly out to look the situation over we slowly but surely sank into three feet of soft snow the bottom foot of which was very slushy and very wet. Accordingly “a plan was made” that Gordon would proceed ashore on snowshoes to interview the officials at the mine and send back a colophon and the snowshoes for the baggage to retrieve. In this way our expedition was landed on the shores of Little Long Lac and the Homet left in its tracks.

Next morning we assembled a salvage crew complete with skis, snowshoes and shovels to dig out the Homet but as fast as we'd dig her out of one spot we'd get stuck in another. We eventually discovered where the snow was sufficiently firm to carry the weight of the machine but unfortunately it was not in long enough stretches to allow us to get up flying speed. We therefore

went galloping up and down the good patch of snow following the same ski tracks each time until at the sixth attempt we finally staggered into the air over the trees and power line and were on our way to Port Arthur. This was another of our good weather flying days and after we got through some local snowstorms around Lake Superior, we had a most enjoyable trip along the north shore of Lake Superior. Port Arthur was Gordon Scott’s last port of call and there we took aboard the newest “co-pilot” in the person of H.H. Wilson of Imperial Oil's Technical Service Division at Regina.

Two days later we headed north and west and arrived at Sioux Lookout via Ignace where we landed to take on a little fuel. Sioux Lookout is a very important air transportation centre as well as being the western headquarters of the Ontario Provincial Air Service. It has been the main aerial jumping-off place for the mining areas of Red Lake and the Patricia District.

Bright and early on Monday morning we left for Pickle Lake and Central Patricia mines. Having had the good fortune to participate in the earlier developments of the Pickle-Crow mines, back in 1929, we naturally looked forward to the great change wrought by the intervening years. From the lake we rode in four miles to Central Patricia on a horse-drawn sleigh over a reasonably good road to find a fully-equipped production mine complete with stores and residences, Central Patricia and its neighbor, Pickle-Crow, have a joint monthly output of approximately $200,000 where three years ago they had but passed the stage of some diamond drill holes, a few log buildings and surface development work. All the necessary equipment was either flown in or hauled in by tractor through the bush in winter.

Once again the weather held us to the ground for two days, first through a sleet storm which put a quarter of an inch coating of ice all over the surface of the machine, then the following day it snowed steadily so we spent most of the day de-icing the machine. Next day

the weather cleared so we went bright and early to Argosy mines. From there we left again for the Jackson-Mansfield. Here we encountered a few snowstorms we were forced to land at the Forestry Camp at Swiss Lake. Here we got stuck again in the soft snow and spent a couple of hours paddling down a runway with snowshoes before we were able to get off. We just managed to sneak near our destination under a snowstorm, landed about two miles away and promptly stuck fast again. Harry was elected to snowshoe to the mine and send us word out the machine while he interviewed the mine officials. In due course help arrived and we hauled the machine out of the slush. Unfortunately snow conditions still made it impossible to get off so we decided after two fruitless attempts to abandon the trip to Sioux Lookout for the time being, hoping that the weather would turn colder during the night and make the cheeks of the snow sufficiently firm for us to get off in the morning. Reluctantly we started the truck back to the mine, the third time for Harry to cover the distance on snowshoes. Despite the fact that we'd flown about 160 miles, Harry insisted that if his feelings were anything to judge by, he must have walked twice that distance! We were hospitably received and accommodated for the night by the staff at Jackson-Mansfield and also had the pleasure of accompanying Mr. Thompson, mine manager, underground.

The weather turned cold during the night so we had little difficulty getting off and arrived at Sioux Lookout after a very uneventful flight. From there we hopped into Winnipeg in two hours and ten minutes, a distance of 240 miles. Two days later we set out for Sioux Lookout accompanied by F. E. Gallagher, assistant manager of the Central Manitoba’s Winnipeg Division.

This time we were helped along by a forty-mile-an-hour tail wind and ideal flying conditions—all of which we felt was too good to last. Sure enough we soon ran into a snowstorm and by the time we reached Neidrie the visibility was down to a point where we felt it inadvisable to push on any further; so picking out a suitable lake we camped for the night with the very hospitable owner of the settlement’s only store. Next day we reached Sioux Lookout and the following day flew into the Howy mine at Red Lake. The town of Red Lake is an outstanding example of how civilization alters the landscape even in remote places. Discovered in 1915 by the
numinous and damnumed such frequent fueling and oiling that the oil business grew apace. Ontario was too large a territory to be handled from one city and was divided into east and west with the western head- quarters at Hamilton under P. W. Gordon. Miss Bell went with him to organize a stenographic staff there and Miss Pennington became head of the sales stenogra- phers in Toronto.

The offices on Bay Street were outgrown by 1916 and the different departments of the Company which had been variously housed were gathered under the roof of the new and imposing building at 56 Church Street. The new quarters were more pleasant and Miss Pennington settled down to work harder than ever. Many girls have come under her kindly and helpful influence. Her method of training is so strict and tactful that a new girl feels at home immediately and starts off "on the right foot."

Four men have headed Toronto Division since Miss Pennington's advent. J. F. Sharford retired in 1918 and was succeeded by G. H. Hamley who was followed by Colonel E. A. Oliver in 1921. Ten years later Colonel Oliver retired and D. S. Bell became Manager. Each contributed to Miss Pennington's business education. She says that no two of them have been alike, but their methods of work have been interesting and that she enjoys working for men of the calibre of her "Big Four."

Miss Pennington has an unusual flare of understand- ing. She gets along equally well with men and women. This trait probably accounts for the pleasant atmosphere which she creates, with a twinkle in her serious blue eyes, has always existed in her relations with her associates in Imperial Oil. She is liked and respected by all who know her, by the men she serves as well as by the girls under her charge. Her recreations are golf, tennis and bowling and she is an active member of the Business and Professional Women's Club.

THE CRUISE OF THE HORNET

(Concluded from page 21)

faq to Detroit and Toronto, all right for some pilots but not by any means our idea of good flying weather."

Thus ended the cruise of the Hornet. We had been in the air just over sixty hours, visited over 20 im-
portant and almost inaccessible mining properties and as many air bases as possible. Valuable contacts were made and data collected on our experimental winter grade Stanavo Aviation Oil. And we discovered the truth of the adage that one half of the world does not know how the other half lives. Those who live in the cities know little of the lives of the people who pioneer, who carry on one of the nation's most vital industries in the remoteness of the northern mining areas. These people are too busy doing things that

PETER FISHER'S TEN YEARS

The writer of this letter has been the Imperial Oil Agent at Roseburn, Saskatchewan since 1926. His letter is typical of many received by the Secretary's Office from those who have earned them by long and

I BEG to acknowledge receipt of your ten-year service button which I received recently and also express my appreciation for this same token of service. I assure you that the time I have spent in serv- ing Imperial Oil Limited is a period that will always be included in my fondest memories as one of the most pleasant periods of my life. It has always been a source of personal pride to me to know that I was serving one of the largest and also most human business organiza-

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that old contraption, if Miss Pennington wanted to check up on the accuracy and neatness of her work, she had to lift up a big cover, elevate the roller mechan-

ism and peer into a dark cavity. To erase an error was a major operation.

It wasn't very long before this quiet-mannered, pleasant-voiced, capable girl became secretary to the Manager, J. F. Sharford. Under his guidance, she began to learn a great deal about the business. She was interested in everything that went on and various other responsibilities were added to her stenographic duties. Some of these extra were quite unusual for a girl, such as looking after the Division's horse-drawn equipment. Miss Pennington became quite an authori-

ity on the appetites, dispositions and vagaries of the harshest, powerful steeds which added so much to the impressiveness of the Imperial Oil retail delivery system.

Then occurred an event which not only relieved Miss Pennington of her worries over horses but heralded a new era in transportation and necessitated drastic improvements in road building. A motor truck truck was sent to Toronto from Halfton where it had been more or less of an afterthought. The experiment was successful. Trucks and automobiles were becoming so

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FROZEN FREIGHT

By A. J. Dalrymple

Carl Welwyn was hungry. He was hungry for the sight of food for himself and for his horses. Carl, the "Swing" boss, who had always come through in spite of bad weather and hard luck, was staring defeat right between the eyes. He was a stocky little frontiersman, a blazer of trails of the Northland and was in charge of a "swing" of four teams of horses hauling as many sleighs of supplies into the trading posts beyond the "steel". His job was first to get the goods to their destination and then to return to load up for the city markets.

He had delivered the goods. Three weeks of breaking trail through the deep snows of the bush and the drifts on the lakes had been the price of victory. He had arrived at Whipping Post a week behind schedule. That was bad. It meant short rations for horses and a return haul. Carl was a horseman and if the thought burned deep, he didn't make much of it. There was no use surveying the scene he knew so well—nine miles of lake with a low range of rocky hills topped with evergreens. No hope for feed on that horizon. Tough as he was, he looked hopefully upward for help. And out of the heavens help came!

A distant pattering, like the sighing of a freshening breeze, hit his ears. It increased and became the familiar sound of aircraft. The 'plane flew closer, circled and re-circled. Then it dropped, glided and came to rest a hundred yards away.

Welwyn walked over. The cabin contained six bales of hay and two bags of oats. There were no outward signs of rejoicing.

"Tough going," queried the pilot in a matter of fact voice.

"Yeh, tough. We sure need the stuff," answered the "Swing" boss. "It's been the worst winter in 20 years."

"The weather was so bad," began the airman with hesitation, "that the big boss figured that since you were overdue... maybe you could stand a little more feed. If this will carry you to Mink Portage, I'll drop down a cache there tomorrow and we'll keep contacting you until you get to the railroad. Here's a grub box for yourself and the men."

"Oke. thanks."

The hay and oats and a case of food were tumbled into the snow. With a swift survey of the approaching dusk, the flyer was on his way.

On either side of a desk in the office of the Spruce Lake Freighting Company, sat "Big Bill" James and his brother Fred. They gazed out of the half-frosted window overlooking the settlement of Spruce Lake.

"The plane costs us $100 an hour," said Big Bill.

"How many trips do you figure it will have to make to get those horses out of there?"
A COOK'S TOUR OF THE GODS LAKE COUNTRY

By Frank Athey

The author of this article is a student in Engineering at the University of Manitoba. Like many of his fellow students, he prefers to spend his vacation working and acting as look-out for the geological survey party of which he speaks. His home is the Imperial Oil agent in Dysart, Saskatchewan.

Last summer saw a great number of young Canadians in the North country, practically all of them students working on the great geological survey in northern Canada. They spent a busy summer and accomplished a lot of work in connection with mapping various areas.

Aside from its geological possibilities and as a good place for a summer holiday, they came to realize the importance of this country from other viewpoints. Untold wealth lies there for those who have the courage and energy to venture into new lands.

Canada is a young country, and the history of her development has been a history of work and man's determination to conquer Nature at whatever cost. We go further north the task becomes increasingly difficult. More power and steam are needed with the result that more and more gasoline and fuel oil are consumed to project man and his whirling wheels into the deeper sanctuaries of the pulp of the North.

Aviation is playing a great part in this development, especially in watercraft and mail service and in the assistance it gives to the medical profession. Fuel bases are established usually at mining centres or Hudson's Bay Company outposts. The fuel is brought in during the winter not by the traditional dog teams but by "cat" trains. The cat train is not a feline competitor of the husky, but is the short for caterpillar tractor train. These gigantic tractors drag huge sleighs carrying tons and tons of freight over the ice and snow. If "husky" and "mushing" sound romantic, "cat" is more so to the modern ear.

Romantic as it may sound, however, this transportation is very expensive because the prices of fuel and food in the northern wilds are much higher than in the larger centres of population.

Gasoline can be regarded almost as the liquid gold of the North since such large quantities of it must be brought in at such high cost. Gasoline, kerosene and fuel oil are used not only for transportation but in mine construction and operations. Even the Indians realize the value of petroleum products. It is very Indian's lifelong ambition to buy a "one-lung engine and a gallon of gas" and take his family for a ride in the canoe, or canoes if his family is large.

Gasoline is transported usually in the well-known 45-gallon steel drums. Sometimes, when it is to be carried by plane or canoe, it is put up in four-gallon tins, two such tins being packed in a sturdy wooden crate.

In this form it is easily handled and makes a convenient tump load for portages. These cases must be handled very carefully lest the tin be damaged—a leak is very expensive. One learns much about the careful handling of petroleum products on such trips. A slow leak might allow gasoline to trickle down a man's back, and burn his skin. Leaking gasoline might also damage precious food and it is always discouraging when a "kiddie" gives a spurt and dies for lack of petroleum nourishment, obliging one to paddle the last 50 miles or so.

Even one summer in the North brings a realization of its vastness and possibilities. The old timers have a saying to the effect that a good woodman can never starve in the North. But he can run out of fuel. If there is a shortage and it cannot be bought at any price, Nature chuckles up one for her side.
OBITUARY

JOSEPH WILLIAM LAXTON

It is with deep regret that we report the death of Joseph William Laxton on January 25 last, at the age of 38 years. Mr. Laxton started with the Company in Regina in 1919 and when Brandon was opened as a Division he was transferred there as recap clerk. On the closing of Brandon in 1933 he returned to Regina office as statistics clerk which position he held till his death. "Joe," as he was known to his friends, was of a reserved disposition, always confidential in his own business, performing any task he undertook in a very thorough and efficient manner. He applied to his work in the office and to his hobbies outside the office. During his 17 years service with the Company he held the positions of recap clerk, station inspector in charge of farm credits and statistics clerk. He was a member of the Regina Boat Club, taking long interest in sailing. Two years ago he built a 28-foot racing cat boat, which had the reputation of being the best on Wascana Lake. He was also accomplished in commercial art, having won a valuable prize for an illustration he made in a competition in the U.S. The making of moving pictures was another of his hobbies. Besides his relatives and friends outside the organization, "Joe" will be missed by scores of Imperial Oil employees in different parts of Canada.

GEORGE A. WOODLAND

By Alex. G. Run

After an illness of several weeks, George A. Woodland passed away at the General Hospital, Prince Rupert, B.C., on April 7, 1936. Mr. Woodland, who was well known and highly esteemed in Prince Rupert and vicinity, had been manager of the Company’s bulk plant there since its establishment in 1913. Mr. Woodland was born at Halfax, Nova Scotia, in 1876, and like most boys in garrison towns, was attracted to army life. He enlisted as soon as he was old enough, and when war broke out in South Africa, in the autumn of 1899, he was sent there as a member of the King’s Eighth Liverpool Regiment. He was throughout the famous siege of Ladysmith, serving under Sir George White, Commander of the garrison.

Eventually he returned to Canada, and finally located in Vancouver, where he came in touch with C. M. Rolston and joined the Imperial Oil Company Limited as a salesman in 1911. For two or three years he served practically the whole of British Columbia, and in 1913, when it was decided to establish a large station at Prince Rupert, the Western terminus of the Canadian National Railway, he was chosen for this responsible position. He was a man of many interests and active in various local organizations. From time to time he contributed to the Review articles dealing with subjects of the best track. Those of us who have worked with him for many years realize that we have lost a real friend, and his ever ready guidance and advice will be greatly missed. The Review joins his many friends and associates in extending their sympathies to Mrs. Woodland in the loss of one who was so greatly and deservedly respected and loved, and whose passing is so deeply regretted.

VINCENT D. DOWNEY

By W. B. McGrath

The Company suffered a great loss when V. D. Downey, Calgary City Salesman, passed away at his home in LaCrosse, Wisconsin, on May 22. Mr. Downey had been on sick leave since June 1, 1935, and after regaining his health to a certain extent, underwent an operation on May 19, from which he did not recover. " Vince" joined the Company in 1910. He was born in Owen Sound and was the Company’s agent there until 1921 when he retired under the provisions of the Company’s Pensions Plan. Mr. Cox was liked and respected by all who knew him and our sympathy is extended to his sons and daughters in their loss.

GEORGE A. WOODLAND

By Alex. G. Run

36 CHURCH STREET CLUB

By John Ness

The winter activities of the 36 Church Street Club have ended in a blaze of glory. As a matter of fact, the Drama League was not satisfied to leave the stage in any metaphorical blaze but put on their most realistic performance in the "Work Shop" with the Toronto Fire Department as supermundane.

Fortunately the conflagration occurred in the dead-watches of the night so that no lives were endangered and the "Work Shop" has now risen Phoenix-like from its ashes amid looking for new worlds to conquer.

Not being a dramatic critic, it is, perhaps, unfair to dwell at length on the performances staged by the Guild at the large Eaton Hall. Whether "Ow'ard Bound" or "Dear Beatus" was the greater success in a dramatic sense, a mere low-brow dare not say; but, in vulgar parlance, both were swell. We have always admired the ability with which some of our members can scintillate in the role of hard-working wage-earners, but in the presentation of these two plays we certainly had proof that this does not exhaust their histronic attainments and to see them strut the stage with all the suave-faire of Garbo and Barrymore was a revelation.

Not all of the praise should be lavished on the principals, because the performances reflected great credit on those who were behind the scenes in whatever capacity. When next the Dramatic Guild appears in public, we feel safe in predicting that the Margaret Eaton Hall will once again accommodate its hosts of admirers.

The Annual Dance has come and gone and 344 paid admissions gave evidence of the growing popularity of this outstanding event in the social whirl. Thanks to the efforts of the Committee, the evening passed without a hitch or a discordant note, providing that one takes a tolerant view of the music. Sean St. John and his orchestra provided the incentive for the dancing. Wes and Lisa Adams delighted the company during the interval, and the Royal York management excelled themselves in their supper service. That everyone entered into the spirit of the occasion was manifested by the crowded floor as the saxophone wailed out "Good Night Ladies" as a fitting ending to a memorable and pleasant occasion.

In the starrier field of winter athletics, the Bowling League completed its schedule after twenty weeks of strenuous effort. Whilst we are not in the habit of handing out personal bouquets, it is but fitting that Bob Woods should be señalized out as the man who put bowling back on its feet for the Club. His
modus operandi, backed by the driving force of Frank Whyte and his Committee, made the competition a real success and the interest was maintained until the last ball was delivered.

After a close and at times hectic contest, the Duncan C. Team (Princess Street Works) composed of Misters. H. Archeson (Captain), J. McDouglas, P. Davis, H. Brown, E. Wilkie and E. Krier won the trophy and the miniatures presented through the kindness of F. J. Wolfe. The winners had a total of 67 points and they were chased over the finishing line by the Trons' 62 points, Motoblocks 60, and Atlas 59.

The individual prize winners were as follows:


Prizes were also awarded to the high average man on each team.

Another indication of the revival of interest amongst the Bowlers was the competition for the G. O. Stilman Trophy. Eighteen teams, with two ladies and three gentlemen on each, played a "sudden-death" game for custody of the Trophy and the miniatures provided by the Club. After a close finish, the silverware was annexed by Misters. M. Pennington and R. Lacey and Misters. T. Haws, R. Polson and H. Carey.

The Mixed League will function next season if the enthusiasm manifested in this competition is any criterion.

The Badminton Section brought its activities to a close for the season by staging a very enjoyable social function at the Old Mill.
Miss A. Hamilton presided at the dinner and was supported at the head table by J. R. Simpson, J. A. Cameron and C. D. Crichton, representing the donors of the various trophies.

In the "A" Section, Captain Flanagan's Trophy for Ladies Doubles was won by Misters. A. Goggins and L. Wickett; the Mixed Doubles and custody of the G. H. Smith Trophy was secured by Misters. A. Goggins and Mr. W. R. McAllister, whilst the Men's Doubles and a new trophy presented by Mr. John McNeil fell to the prowess of Misters. J. N. Fitzgerald and A. A. Rowan-Legg Foremost amongst the "B" Section were Misters Marjorie Paterson and Jean Hughes (ladies doubles), Miss A. Hamilton and W. Rough (mixed doubles) and Misters G. Ferguson and M. F. Brown (men's doubles).

Following the distribution of the silverware, the remainder of the evening was spent in dancing.

On behalf of the employees of Imperial Oil as a whole, the 56 Church Street Club donated $150.00 to the Red Cross Moose River Rescue Fund. This was augmented by private donations and a total of $234.85 was forwarded to the Committee who are administering this tangible expression of appreciation to those who took part in the raise of Dr. Robertson and Alfred Scadding.

The Club's plans for the summer are well advanced. Already the cry of 'Fore', along with sundry other expletives, has been heard on the fairways and in the rough of the neighbourhood courses, and the players have had an opportunity of finding out what the golf school has done for them (or to them) over the winter.

The Softball League has organized and will take the diamond shortly with at least four strong teams contesting for the Victor Ross Trophy.

What is more important to the family man is the fact that on Thursday, July 9, cares will be thrown aside and we will proceed to Lakeside Park, Port Dalhousie, for the Annual Picnic.

**KEEPING THE WHEELS TURNING**

The requirements for service in the age of gasoline and oil are well illustrated in the annual report of Imperial Oil Limited, which has just been made public, while a decline in net earnings in the face of improved demand for petroleum products reflects, no doubt, the effects of selling competition in this tremendous field of "big business." Net profits from all sources in 1935 amounted to $3,175,600 or 95.73 cents in 1934.

Few people realize, perhaps, the world-wide extent of Imperial Oil operations, Mr. G. H. Harrison Smith, President, pointed out that only 19 per cent. of the total production of the company's foreign subsidiaries was brought into Canada, the balance being sold in Europe.