TO EUROPE VIA THE ROOF OF THE WORLD

TORONTO JULY 26TH

EMPRESS SERVICE

Even The Horses Benefit By

Imperial Oil Limited
Another projected flight is expected to begin early in July, and will be a solo trip by Arthur Menken, a New York aviator, who plans to fly from New York to Scotland. His Menken will probably fly the same route as taken by the "Unsteiner Brouxer," and expects to land for supplies at Ottawa, Rupert House, Port Burwell in Ontario, taking advantage of the Imperial Oil, Limited supply depots at these places. Campbell and Mount Evans in New Zealand, Reykjavik in Iceland, whence he will proceed to Scotland, probably via the Faroe Islands.

The third flight will be undertaken by Bert Hassell who attempted to fly over the northern route last year. It has been estimated that Mr. Hassell intends to make a survey of this route, so as to determine as fully as possible its convenience and practicability. He, too, will set out from Chicago, and arrangements are being made so that he can refuel at Sault Ste. Marie, Cochrane, Moose Factory, Great Whale River, Port Burwell, Galt, the Imperial Oil Limited supply depot at these places. Campbell and Mount Evans in New Zealand, Reykjavik in Iceland, whence he will proceed to Scotland, probably via the Faroe Islands.

Radio has proved an important adjunct for this flight and by means of its transmitting equipment, the fliers have been able to maintain almost uninterrupted communication with civilization, making it possible for the public to follow the progress of the flight from day to day.

In Part 1 of this paper were described experiments illustrating how forces operate vertically or upward and gave rise to domed-like or anti-clinal structures. Using moving masses of molten and viscous volcanic rock, as well as plastic rock salt, were described as causing such upheavals in nature. Let us now consider the nature of the forces which cause the growth of folded mountain ranges and minor anticlines and synclines not directly related to the upward movement of molten igneous rock.

As already pointed out, the earth, which is essentially a sphere, is forever trying to adjust itself to a compact form. A crude resemblance can be made to an apple gradually shriveling up. The outer skin of the apple may be compared with the outermost zone of the earth (the zone of fracture as illustrated in Figure 1, part 1). As the inner part of the apple loses its moisture content it gradually dries up and becomes smaller in size. The outer skin tries to conform to the inner part, but being more elastic is moved by the growing shrinkage of the fruit. The shrinking of the inner part is due to loss in weight, and thus the surface of the apple develops all sorts of ridges and depressions. Although the same force of this wrinkling must be attributed to contracting forces working toward the centre of the apple, it can also be said that in reality the buckling of the skin is due to compressive forces acting tangentially to the surface. If an apple were as large as the earth these wrinkles would be of a magnitude comparable to our mountain systems, and in a limited area these tangential forces develop along lines of weakness in the earth's outer zone, and that these lines of weakness are usually confined to areas where there are great thicknesses of sedimentary rocks in the process of deposition. Therefore, even though the tangential forces were equal on all parts of the earth's surface, the region where buckling and wrinkling takes place at a given time will be at the locus of greatest weakness. Such a weak spot may be anywhere on the earth, and one day it may be somewhere else. More will be said about this subject in the concluding chapter of the article which will be described a short history of the Rocks and Mountains.

The most extensively employed apparatus to deform artificial layers of rock by compressive forces is pictured in Figure 14. Pressure is usually applied by means of screws which force a block through against the artificial strata. The nature of the deformation is dependent upon the kind of the material used; sediments and the amount of
Frequently, the geologist decided was best on the anticline. The only information available for observation to the geologist was the nature of the rocks shown above the broken and bunched line, and a fairly good log of Well "B" which was drilled some years ago. Anything below

that broken line is to be regarded as beneath the surface. At "X" the geologist records a dip to the left, and at "Y" a dip to the right, and these constitute the two flanks of the anticline. If he is a wise

awake man he may notice that there is something not just right at "Z", and he might actually indicate a "fault" or a "disturbed" zone at "Z". However, from the

what depth the oil horizon will be encountered. Drilling commences in bed "B", and the samples of the rocks encountered in the hole are examined by friend geologist. The part from the surface to 1,000 ft., is let us say, a green sandstone "A", "Just as I had figured," the geologist says. At 1,010 ft., is encountered layer (system "A"); a dark shale. The geologist gets all

states that the "Pay" will be struck not at 3,000 ft., but at 3,007 ft.

Drilling is again resumed, in a bluish sandstone series "O", and at 2,002 ft., another marker "P" is encountered which causes the geologist to think of resigning from the company and to start in for himself. Anyone who can bit things on the head, as he has, is wasting good time and money by working for a mere salary. However, he decides to play fair with his company, and let things go even without a raise in salary. Besides, his

FIG. 24. Stereogram view of another model illustrating another miniature mountain range or anticlinal uplift. Pressure was applied as indicated by the arrows. The scale represents 6 inches.

FIG. 25 to 27. Illustrating various cross-sections cut through the model shown in Fig. 24. The position of the sections (as indicated by letters A-B etc.) correspond to those shown in Fig. 17, but apply to the model illustrated in Fig. 24. Note the difference between the corresponding sections of these two models. Line-work on both models are correspondingly indexed in these sections. The black dots are layers of water, while the grey material is sand mixed with water and cement. The anticlinal nature of the deposits are evident in some of the sections. The arrows indicate the amount and direction of pressure applied. The scale represents 6 inches. Note the difference from section to section.

FIG. 31. Illustrating how a borehole "A" may duplicate beds by passing through faults. The geologist can see at the surface only that portion of the model lying above the dashed line "A", not the entire location. "A" is the basis of such findings. The borehole is indicated by the black line "B", the vertical lines "C", "D", "E", "F", etc. The "d" represent the various beds or strata involved in this section. The hypsometric scale is indicated on the left in thousands of feet. "D" is an abandoned hole, the log of which is available to the geologist. By drilling either to the right or left of "A" he can dupli cate beds by passing through faults. When he drills to the right of "A" he is indicating a condition different from the first fault. He encounters another marker "P" after passing through the first fault. The geologist at once, comes out with the statement, "The hole will be very deep."
SAINT HUBERT AERODROME

With the completion of plans as already adopted by the Department of Civil Aviation at Ottawa, Canada will possess, in the St. Hubert Airport and airship bases, one of the world’s finest and most completely equipped airports.

The Airport is, to a certain measure, the outcome of Premier King’s promise at the Imperial Conference in 1926 that Canada would give wholehearted support to the development of a system of air communications within the Empire. The site of the Airport, about seven miles south-east of Montreal, was selected after exhaustive study and after recommendations approving of it had been received by two representatives of the British Air Ministry, Major C. H. Scott, in charge of airship developments in the Royal Airship factory at Cardington and Mr. A. R. Gibb of the Civil Engineering Staff of the Air Ministry. These gentlemen visited Canada in the summer of 1927 and after examining all likely areas in Eastern Canada reported that the site at St. Hubert, covering an area of 729 acres, was most desirable. It is expected that some time this year the giant British airship, R-101 will fly from England to St. Hubert Airport and back again.

To a visitor at the Airport the most impressive feature, apart from the general activity of incoming and outgoing planes, is the great mooring tower which has been erected in anticipation of the R-101’s visit. This mooring tower is equipped with the most efficient machinery obtainable. The tower head was built in England under Air Ministry supervision. A siloed hydrogen gas plant has been installed and the housing of the base, as will be noted from the photograph reproduced here-with, is now practically complete. The elevator installation has also been completed and the tower will be ready for the arrival of the R-101 at practically any time now.

The R-101 is by far the largest and most pretentious airship ever constructed. Her cost runs into millions sterling and her passenger accommodation includes one hundred state rooms—which, it is said, are quite as comfortable as state-rooms on the continental trains. Her saloon is as spacious as that of a large yacht. She boasts a dance floor and three promenade decks. As she is of size and capacity not previously attempted, her design incorporates a great number of new ideas, all of which will be very thoroughly and interestingly tested when she sails from England for St. Hubert Airport.

The ground plan of the Airport, which is reproduced with this article, affords some conception of its size and of the thoroughness with which it has been planned. With the completion of the drainage and the servicing of the three main runways the landing field will be unexcelled and will be one of the safest ever offered for fliers. A vast volume of work has already been done and much remains to be done before all plans are completed but even at this time the temporary aerodrome, which was cleared and graded in 1927, is a very satisfactory landing field and all air mail transport in Eastern Canada radiates from this point.

Last year the first permanent hangar, 80 x 120 feet, was completed and intermediate flood lights, tower obstruction lights and a flashing beacon have been installed so that night flying is now possible from the field. A Radio Station has been erected and weather reports are received regularly for the use of visiting fliers. A Meteorological Observation Station has also been established. A number of commercial aircraft operating companies are now using St. Hubert airport for passenger, freight and mail service and a school of flying is also conducted there. The Montreal Light Aeroplane Club has rented space for its operations. During 1928 there were 30,500 pounds of mail carried to and from St. Hubert Airport and the mileage of international traffic flown to and from the Port is estimated at 45,428.

Plan view of the airport at Saint Hubert, P.Q., showing hangar locations, workshops, mooring mast, runways and the other equipment which in the course of time will make this one of the foremost airports in the world.
Upper left-hand corner: Christening the Imperial. Prime Minister, The Hon. W. G. Van Horne, of Ontario, smashes the traditional bottle of champagne on the propeller boss.


Centre: CF-AAA, the Gypsy Moth plane which was presented by Imperial Oil, Limited to Major-General J. H. MacBrien, and christened the Imperial. Immediately below this is shown the arrival of the Imperial.

Lower left-hand: Departure of the first air mail from Hamilton. The Postmaster turns the mail over to Pilot Parkinson of the International Airways of Canada, Limited.


The winners of all events were using Imperial Oil, Limited products.
HAMILTON AIRPORT OPENING

HAMILTON, which is frequently referred to in the East as the "Ambitious City," justified this designation on June 6th, 7th and 8th when with very elaborate ceremonies the splendid new Municipal Airport was formally opened for public service. The event was one of the most notable on Canada's aeronautical calendar for the year, and drew thousands of people and a large representation of flying men and planes from Eastern Canada and many points in the United States.

The port was officially opened by Hon. G. Howard Ferguson, Prime Minister of Ontario, who was accompanied by the Hon. W. H. Price, Attorney General, and the Hon. F. E. Smythe, Minister without portfolio.

A feature of the programme on June 6th was the presentation of one of the latest models of the Gypsy Moth light aeroplane to the Aviation League of Canada, an organisation which has branches throughout the Dominion and which is very actively promoting the growth of flying in Canada. The plane was presented by Mr. Victor Ross, Vice-President of Imperial Oil Limited, acting on behalf of the company, and was received by Major-General J. H. MacBrien, C.B., C.M.G., D.S.O., President of the League. Immediately following the presentation, Hon. Mr. Ferguson christened the plane in the traditional manner by breaking a magnum of champagne on the nose of the propellor.

The plane presented to the Aviation League is a very striking machine finished in white with red stripes and with all metal parts chromium plated. It was flown from the De Haviland factory at Toronto to Hamilton by E. Leighton Caprose, test pilot for the De Haviland Company. The fuselage is all metal and is constructed in six sections built of square tubing. All joints of the tubing are welded to the star plates and each tube is sealed at both ends and specially treated as a precaution against corrosion. Other features of the plane are the new steerable tail skid, the super absorber split axle undercarriage, the retractable block mounting of the engine and the slotted wings. The plane has a top speed of 105 miles an hour and a cruising speed of 85 to 90 miles an hour and can climb 700 feet a minute to a maximum height of 18,000 feet. The "Imperial" will be used by Maj.-Gen. MacBrien in his travels throughout Canada in the interests of Canadian aviation. Following the opening ceremony of the Hamilton Airport Gen. MacBrien flew to Ottawa and thence back to Toronto en route to Detroit where he was the guest of Mr. Henry Ford at the Model Aircraft Tournament at Dearborn Airport. Gen. MacBrien then proceeded East to attend the openings of the Saint John and Halifax Airports. Following these ceremonies he intends to go throug the Pacific Coast, travelling all the way in the "Imperial," and stopping at numerous points to visit flying clubs and commercial flying organisations.

On the evening of June 6th a municipal banquet was held at the Connaught Hotel to celebrate the Hamilton Airport opening. Two of the guests of honour were the Prime Minister of Ontario and Major-General MacBrien, both of whom, in the course of their addresses paid tribute to the service which is being rendered to aviation in Canada by Imperial Oil Limited.

LEGENDS OF OLD QUEBEC

WHEN Jacques Cartier sailed up the St. Lawrence some four hundred years ago and established his headquarters at Hochelaga, the history of Canada as recorded in books began. Little did that intrepid explorer dream of the vast territory he was introducing to the world, of the mountains and rocky fastnesses rich in minerals; of the prairies, now a rolling sea of golden grain; of the forests fed into the saw of huge machines to make a fair white paper for the world's insatiable demand for waterfalls trained to light myriads of lamps and turn wheels without number; of hidden pools of petroleum, that strange substance thrown as potent as gold; of his little fortress grown into a great city linked by smooth highways and the gossamer of the telegraph to thousands of other municipalities. The lonely wilderness has in less than four centuries become a country important in the economic scheme of things. Where the Indian hunted wild animals for his food and clothing, and waged his tribal wars, representatives of every nation under the sun take part in industries as varied as their nationalities.

But this transformation came slowly at first, and the handful of Frenchmen, and later their wives, braved many a lonely winter, hemmed in as they were by the hungry animals and restless savages, cut off from civilization.
The Magic Napkin

St. Lawrence itself created strange impressions, and many new legends were added to the ancient folk lore and handed down from generation to generation.

The “Magic Serviette” is another naturalized story and tells of Jean, the youngest of the king’s thrones, who was left stranded on an island while exploring his father’s kingdom. Naturally he

(Continued on Page 16)
Making Mountains

Guaymas differ from all other coralline in that they host exclusively by sight from the air, like hawks, the location of the schools surface swimming to which rises before descending to take the water to catch them. These are about 20 inches high, and when fully grown weigh approximately 12 pounds, and a half-pound in, a green, the spiny heads have a glossy green and blue-black neck and back, a white throat, a red and yellow ventral, and a set of fine, almost invisible, pink fins. On the shining sandy coast of Peru, dense masses of guaymas forming large rafts, press along the sea, a good life fish in their path, the hinder parts of the rafts continually rising into the air and pouring over the sun in some cases as if as the waves over a sandy beach. The sower pigeons are said to have once roamed through open North American forests. At other times, when they are moving toward distant right above the ground, the black-backed, flocks, but rather as a solid river of birds which streams in a typically marked, unbroken column, close above the waves, until an observer is actually wearied, as a single formation takes four or five hours to pass a given point.

Legends of Old Quebec

Our Front Cover

The birds shown on the front cover are some of the most interesting and important birds that inhabit the many lands of Peru. They are strictly creatures of the Humboldt River and the Humboldt Gulf, on the Pacific coast, and are the oceanic stream that washes the Peruvian coast. These birds belong to the family Laridae, and are known as the Larus paradoxicus bousquetii.

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a year later was invalided home, and was still under observation when he began his university work.

Mr. Huggett matriculated at the age of 16 years, but did not renew his studies until his 21st year. His academic record is a fine one. In his first year at university he was awarded a Soldier Scholarship. In 1924 he received the degree of B.A. Sc., with honours. After a year of post-graduate work in applied science he won his M.A. Sc. with first-class honours, and also the "Nichol" scholarship which gave him three years of further study in Paris, France. In 1933 he received the degree of Doctor of Science from the University of Paris which he won with first-class honours and distinction.

This young man has now begun his career as a scientist, and by all indications should make an enviable reputation for himself.

CALGARY

The same way as the sales force are on the job with Marvelles, so the athletes of the Calgary Division have worthy upheld the honour of the organization.

The Marvelles—Calgary's Imperial Oil Limited hockey team—owed no uncertain manner to be the winners of the Calgary Mercantile League. The boys put up a fine brand of hockey, winning nine straight out of the first ten, and after a tie at the end of the third game in the playoffs, moved out in front after twenty minutes overtime play.

This is the first year that Imperial Oil Limited has been represented by the Calgary Mercantile League in a definite way with a whole company team. Willing players were recruited from the office, the refinary and warehouse. The team worked together in perfect harmony, managing to finance themselves without any outside assistance, under the leadership of Wm. Speck, Captain, W. J. Campbell, Manager, and George McKeown, Sec-Treasurer.

TORONTO

56 CHURCH STREET CLUB

The struggle for the Victor Ross Trophy is on, and every Wednesday and Friday, weather permitting, the Babe Ruths and Walter Johnstons of the 56 Church Street Club Softball League will be seen Descriptor themselves in Ramsden Park, Toronto.

The teams forming the league are Marvelles, Premiers, Ethels, Royalties and Interpes, and if the players are half as good as the products enblazoned on their sweaters, some real ball should be served up.

The opening ceremonies were conducted by Colonel E. A. Oliver, assisted by Mr. G. W. Mills and President Jimmy Pope of the 56 Church Street Club. In charge of last year's champion Marvelles.

A large number of fans saw the double-header which inaugurated the season, and, from the peppy exhibitions staged, there is every indication of a real fight for the silverware.

Golf is not a game, it is a disease and some of the golfing enthusiasts of the Club found it almost a fatal malady at the St. Andrew's Course where the first monthly competition was staged.

Strange tales have filtered back from the battle-field, of strong men shedding tears in the bunkers, of putters shattered against unoffending but convenient trees, of knees-high crouper on the fairways, of lost balls, kidsy puts and the need for a reliable adding machine at every green.

As the sun sank low beyond the horizon, the firm of accountants who were auditing the score-cards announced that, to the best of their knowledge and belief, Jimmy McPhee, the celebrated Scottish professional, had won first prize, but that only a trial balance had been struck for the Ladies’ section which indicated a deficit of four balls a head.
IMPERIAL OIL REVIEW

Protest has been made that one member of the Marine Department used a Mariner's Compass to keep on the fairway, but it transpired that he had not made allowance for the "magnetic variation" and had lost eight balls. The secretary was instructed to write him a letter of condolence.

These monthly tournaments threaten to become popular and the full should see keen competition for the trophies promised by Mr. G. H. Smith for both ladies' and gentlemen's sections.

At four centres throughout the City the devotees of Tennis are enjoying the facilities provided by the Parks Commissioner. There is still room for many more players in this section of Club activity and, if the patronage warrants it, a city-wide tournament will wind up the season.

OTRIBUTARY

GEORGE H. OKE, an old employee of Imperial Oil, Limited and for forty years past an annuitant under the Imperial Oil Annuities Plan, died in Port Huron on March 18th last. Mr. Oke, who was in his sixty-fourth year entered the service of the Queen City Oil Company in 1886 in the Accounting Department. He became an Imperial Oil employee in 1914 when Imperial Oil Limited took over the Queen City Oil Company, and he continued to serve the Company until the end of March 1925 when he retired to enjoy the annuity which his long and faithful service had earned for him.

THE tragic death of Mrs. Margaret Casterton, wife of John Ward Casterton, formerly Purchasing Agent for Imperial Oil, Limited, has occasioned a general regret among Imperial Oil executives and employees to whom Mr. Casterton is well known. Mr. Casterton resigned his position with Imperial Oil, Limited, in 1921 to accept an appointment in New York and made his home at South Orange, N.J.

During the night of June 9th the fire broke out in Mr. Casterton's home and he and his two children, Robert, aged twelve years, and Jean, aged ten, were rescued with difficulty. By the time the firemen reached Mrs. Casterton's room she had been overcome by smoke and prolonged efforts at resuscitation proved unavailing.

To Mr. Casterton and his family Imperial Oil, Limited extends condolences in their sad bereavement.

SALVAGE KING EFFECTS HAZARDOUS RESCUE

When the tug SALVAGE KING berthed at her pier in Victoria (B.C.) Harbour on April 26th, she had completed a voyage outstanding in marine history on this continent. Starting from Dutch Harbour on March 12th with the disabled Japanese freighter HAYASHI in tow, the sturdy submersible captain by J. M. Hewson and manned by a splendid crew of fine seamen fought her way across the Pacific to Osaka and thence to Yokohama through a series of terrible gales. Such able seamanship was displayed on this perilous trip that the tow line used to link the vessels never once broke nor lost its firm grip. The SALVAGE KING is a regular and welcome visitor at Imperial Oil, Limited marine supply depots on the Pacific Coast.
In flying togs—Major-Gen. J. H. MacBrien, C.B., C.M.G., D.S.O., one of Canada's most distinguished soldiers and formerly President of the International Airways of Canada, Limited, who has relinquished his private interests to devote his time to the promotion of civil aviation in Canada. General MacBrien is seen standing beside the aeroplane presented to the Aviation League of Canada by Imperial Oil, Limited and which he is using to visit flying clubs and commercial flying organizations throughout the Dominion.