MEN who do business in great waters have always been a hardy folk. None of other kind they can face with casual glance and shrugged shoulders the white anger of a winter gale and all the other evils that sea-luck may hold in store. In the good old sailing days of peace they would come ashore, perhaps after a stretch of 100 days or more of the same grumpy enemy.

But how much greater their perils in war-time! The tankers on which the virtual life of ships, aeroplanes and artillery depend are the special quarry of submarines and raiders of all the world around. One torpedo, even one shell, can set a fire that can burn without trace the crew, leaving men dying in a sea of blazing oil. At best some survivors in open boats may drift for days and nights on an empty and hostile sea.

Yet such men when brought ashore, faint from hunger and thirst, are no sooner restored to their usual well-being but they grin, spit brown and sign again on a tanker, travelling singly or in convoy to wherever, the world around, fighting men are clamourous for supplies. Like rugged, close-grained and indestructible teak-wood is the courage of these sailors with bearded lips who bring the life-stuff of victory to port, or die trying.

—From the Annual Report, Imperial Oil Limited, for 1943.

Slogging along at ten to twelve knots—carrying cargo as dangerous as high explosive—special prey of the U-boat—oil tankers have played a heroic role in a war in which shipping has played so great a part. Through the roaring heat of the tropics and the bitter cold of the mid-winter North Atlantic gales, they have carried a steady stream of oil to the world's fighting fronts.

Survivors leaving M.S. Calgicrolite after she was torpedoed and sunk in May, 1943. The Calgicrolite was one of four Imperial Oil tankers lost since the outbreak of war.

Many of the tanker crews who take their ships and the precious fighting fuel to wherever they are needed never knew overseas service before the war.

The ships of the Imperial Oil tanker fleet, for instance, plied the Atlantic and Pacific coasts, bringing crude from South America and United States ports to refineries in Canada. On the Atlantic, eight Imperial Oil tankers hauled an average of 100,000 barrels of crude oil per trip from Cartagena in Colombia, Carapito in Venezuela, Aruba in the Dutch West Indies and the United States gulf ports of Houston, Texas City and Baton Rouge, to the refineries at Halifax and Montreal.

On the Pacific the "Albertebelle" did shuttle service between California and the Refinery at Ioco in British Columbia. On the Great Lakes smaller tankers took cargoes of gasoline and lubricating oils from the refinery at Sarnia to ports on the Great Lakes from Kingston to Port William and from Montreal to St. Lawrence and Gulf ports.
It was a new experience for the Imperial crews—and it was hazardous. When France collapsed several of the ships were in French ports. The M.S. "Calgarolite" and the Panamanian vessel S.S. "Joseph Seep" were two of these. Both were bombed, and the "Joseph Seep" sunk. More fortunate, the "Calgarolite" sustained little damage and managed to escape—one of the last ships to leave Le Havre.

After the fall of France the submarine menace rose day by day. On one occasion the M.S. "Torontolite", carrying a cargo of highly inflammable casinghead gasoline and travelling in convoy saw the four ships immediately around her sunk by torpedoes. Then in March of 1941 came the capture of the "Canadolite", travelling alone, three days out of Freetown, her speed cut down because she had not been in drydock for months due to wartime demands, the "Canadolite" was easy prey for a German raider. The Germans put a prize crew aboard the ship and sailed her to Bordeaux where the crew was taken to Germany for internment.

After December 7th of 1941 and the entrance of the United States into the war, re-arrangement of tanker schedules permitted the return of Canadian flag vessels to Canadian service, and the Panamanian flag vessels were returned to the United States operating companies. Engaged in the coastal run once more, Imperial tanker crews found that the danger from submarines had not lessened. On the contrary, the entrance of the United States into the war was the signal for the submarine menace to rise in a deadly crescendo of sinkings. Coastal tankers were their special prey and from February to May in 1942 they sank more Imperial ships than ever before. Early in February, the M.S. "Montrolite", on route from Venezuela to Halifax, was sunk with a loss of 26 men. Twenty men managed to get to the lifeboats, and after three days in the bitter cold of the Atlantic they were rescued and brought to Halifax. Less than a week later the M.S. "Victolite" was sunk. En route from Halifax to Venezuela she was torpedoed without warning and the entire crew of 46 was lost with the ship. Then in May the M.S. "Calgarolite" was torpedoed and sunk. Fortunately, the entire crew was saved. Twenty-two men landed in lifeboats in Cuba and the remainder landed in Mexico.

Imperial's shore staff has played an active part since the outbreak of war. Various experts in the designing, operating and building of vessels were loaned to various Government departments. In the summer of 1942 the Company was asked to develop the possibilities of converting cargo vessels for the carriage of petroleum in bulk. In a few weeks, without (Continued on page 20)
and 94 women, respectively; and for toasting safety weather distresed Canadian ship." Before joining the Merchant Navy in 1940 Captain Dietz served as a Master with Imperial Oil Limited.

** CAPTAIN H. L. THOMAS was awarded the Order of the British Empire. He served in the Mediterranean area carrying bulk petroleum and to and from important oil production centers in the Western Atlantic. Captain Thomas joined Imperial Oil Limited in June of 1926 as a seaman, serving in this capacity on a number of vessels. In 1929 he was promoted to 2nd Officer and from that date until February 1939 acted in all capacities from 2nd Officer to Master in various vessels in the Lake and Coastwise service. In February of 1940 he joined the M/S "Thalia" as Master, on the Panama service engaged in the importation of the Mediterranean area. Later when these vessels were returned to the Panama Transport Company he rejoined the Company's vessels at Master in the Coastwise service and remained in that capacity until recently when he joined the M/S "Willowdale Park" as Master.

** LIEUTENANT COMMANDER JOHN BULMER was also awarded the Order of the British Empire. His citation reads as follows: "This officer has served at sea in charge of the machinery of His Majesty's Canadian destroyers in the North Atlantic for a period of over two years. Through his zeal, efficiency, excellent leadership and unfailing good humor, under the most trying conditions, he has maintained the efficiency of his department at a very high level. Thus, due to his efforts, his ship has always been able to carry out the duties required of her in the Battle of the Atlantic." Lieutenant Commander Bulmer joined Imperial Oil in 1924, and served as Engineer on Company ships until he joined the R.C.N.R. in 1940.

** LIEUTENANT COMMANDER WILLIAM WOODS was also awarded the Order of the British Empire. His citation reads as follows: "This officer has served for over two years in command of His Majesty's Canadian ships in the Battle of the Atlantic. During the whole of that time he has displayed exceptional devotion to duty, cheerfulness and efficiency. He has proved himself capable of acting as Senior Officer of a Group and has, at all times, set an excellent example to those who have served under him." Lieutenant Commander Woods joined Imperial Oil in 1930 and served as Master on various Imperial ships until he enlisted in the R.C.N.R. in 1941.

** CHIEF ENGINEER R. D. KNOX was awarded the Order of the British Empire for war emergency service. Chief Engineer Knox joined Imperial Oil Limited as assistant Chief Engineer in 1927 and was promoted to Chief Engineer in 1928. He served in this capacity on Great Lakes and Coastwise service until the outbreak of war. Mr. Knox remained as Chief Engineer of the S/S "Imper- 
 oyal" engaged in Coastwise and International trade and is present in this capacity on the vessel.

** BOATSWAIN A. C. WATSON was awarded the British Empire Medal. His service was continuous during which his ship was sunk by enemy action. Alexander Watson joined the Company as a seaman in July of 1929 on the "Calgaroil". He was promoted to Boatswain in October 1929 and remained in this capacity on the "Calgaroil" until that vessel was sunk by enemy action. He later joined the M/S "Rogolite" in the same capacity and is still on that vessel.

** SEAMAN T. M. DEWOLFE was awarded the British Empire Medal for "long and meritorious service" during war emergency. Thomas DeWolfe joined the Company in March 1935 as a seaman and has served from that period until the present time on various vessels of the fleet. Most of his time was spent on the "Tahran- 
lite" and on several occasions he acted in the capacity of 2nd Officer. He is at present employed on the M/S "Nipiwav Park" engaged in Coastwise and International trade.

** STOKER PETTY OFFICER HUGH SCOTT, who was mentioned in despatches, joined the Company in 1935. He served as oiler and fireman until 1941 when he enlisted in the R.C.N.R. Mr. Scott's citation reads as follows: "...While his ship was in collision this rating, in spite of the severe damage incurred, assisted Engine Room Artificer D'Askin in trying the engines for damage, and in raising steam in order to attempt to reach port, setting an example by his courage and cheerfulness."

C. E. CARSON HONOURED AT PRESENTATION

MORE than 1,000 employees of the Imperial Oil Refinery at Sarnia joined with officials of the Company and leaders of the community in paying tribute to C. E. Carson on June 30. The occasion was the appointment of Mr. Carson, formerly general superintendent at Sarnia, as general manager of refineries.

Among the Company officials who attended were R. V. LeSueur, K.C., president of Imperial Oil Limited; G. L. Stewart, vice-president; F. W. Pierce, director; W. F. Pervangergast, assistant to the president; and J. R. Simpson, president of Montreal Pipeline Company Limited.

In the morning there was a presentation by the joint industrial council of the refinery. In the afternoon employees of the Company assembled at the plant to honor Mr. Carson and in the evening he was given a testimonial dinner by the chamber of commerce.

In the morning the joint industrial council presented Mr. Carson with a set of cut crystals. Making the presentation on behalf of the joint industrial council members, Hubert L. Baillie congratulated Mr. Carson on his appointment and assured him of the employees' best wishes for his continued success. Mr. Carson expressed his gratitude for the co-operation and good fellowship he had encountered during his 10 years of association with them and assured the delegates he would always have very pleasant memories of his stay in Sarnia.

At the afternoon assembly of employees Mr. Carson was given a gold watch and chain and several speakers paid him high tribute.

In his remarks, R. V. LeSueur pointed out that the first refinery at Sarnia 60 years ago ran about 500 barrels of crude oil a day as compared with approximately 140,000 barrels daily, which is the current rate for all the Company's plants in Canada, and South America.

While at the beginning the Company had no oil production, it is now producing crude oil in Canada and South America at the rate of about 45,000,000 barrels a year.

In stressing the work that is going on to maintain and expand employment he said that the company has approximately 25,000,000 acres of land under survey and geological examination at this time in its search for oil.

Employment has increased from a few men at the beginning to approximately 20,000 men and women at this time. The employment is about equally divided between Canada and South America.

(Continued on page 24)
THE SEARCH FOR OIL IN SASKATCHEWAN

LIKE the late Sherlock Holmes, geologists practice the science of deduction. From things they see and know they form opinions about things unseen and unknown; and while they fall short of the great detective's fictional perfection they can estimate more or less accurately from their observations of the attitude and character of rocks exposed at the surface, the character, thickness, depths and contours of various formations underground.

Through their deductions, and knowing that certain underground conditions are favourable to the accumulation of minerals in recoverable quantities, geologists can advise on or against digging or drilling at any given point; but they cannot say definitely whether success or failure will attend the miner's or driller's effort because nature's aberrations often throw a monkey-wrench into the works. Nature may have concealed below ground strata that did not show at the surface; she may have eliminated below the surface strata that showed at the surface; she may have rearranged the order of the strata; she may have intruded great masses of molten material from the earth's seething interior thus not only displacing the country rock but substantially altering its character.

For example, in the foothills area of Alberta, nature gave the geologist a wealth of material on which to exercise his deductive faculties. There are deep river valleys in which the rock sections can be investigated in detail; there are mountain-sides which approximate geological diagrams; there are the evidences of age to be calculated from rile fossil evidence. But the joker in the deck is the varied anamnesis of faults and thrusts which make a jigsaw puzzle of the underground geology, a puzzle which even the multitude of deep tests already drilled has not completely solved.

In Saskatchewan, however, the geologists' complaint is not that nature misleads him; she more or less ignores him. These same processes which gave us the "Good Earth" and made the Prairie Provisos the Bread Basket of the World, beset such an overburden of soil, clay, gravel and assorted detritus over the landscape, and to such depths, that a geologist is practically denied the makings of a deduction, good, bad or indifferent, and the scant exposures of rock, in situ, are merely an aggravation. An occasional stream may get down to bed-rock; an isolated bluff may furnish a section, but the geologist who tries to reconstruct the underlying picture of Saskatchewan purely by masses of rock, outcroppings and without the assistance of the core-drill, seismic instruments or other remote control tools, is akin to the fiddlers making bricks without straw.

Such was the situation which confronted Imperial's geological parties when they trekked over the meridian between Alberta and Saskatchewan in 1939. It was not, by any means, their first visit; rumours and alarms in previous years had brought them a-running to no avail, but this was the forerunner of a comprehensive, long-term effort to determine Saskatchewan's possibilities as an oil-producing area.

In 1939 and 1940 operations in Saskatchewan were carried out from various temporary headquarters before the present permanent central headquarters was established in Moose Jaw. The field work in 1939 was largely preliminary. One party worked the Sarsi Valley and the other went further afield. Early in the campaign it was recognized that the surface geological information must be limited by some other exploratory tool before final locations could be made for deep drilling operations. Before the end of 1940, therefore, the geological parties had been joined by a core-drill party, double shift gravity meter crew and a magneto-pottery party.

Gravimetric surveying is one of the more rapid of geophysical methods and with the double shift crew working throughout the field season and a single-shift crew carrying on into the winter, nearly 11 million acres were examined during the year. Part of this area was re-worked in the following season, but it was ultimately recognized that Saskatchewan's subsurface was somewhat allegic to the gravity meter and this method of reconnaissance was discontinued.

The core-drill then became the eyes of the geological parties in Saskatchewan. Hundreds of holes were put down, not to find oil, but merely to find rock. These holes varied in depth from a few feet to nine hundred feet, and from the cores recovered the geologists gathered information as to the particular formations encountered and its relationship at the point drilled to a possible oil reservoir. An additional staff of four men was utilized constantly on the examination of these cores and two laboratory assistants were...
charged with making a microscopic search for minute fossils which might aid in establishing the age and correlation of the rocks.

An interesting side-light was an attack, by what might be termed "remote control", on the problems confronting the geologists. At Ottawa representatives of the Geological Department made a thorough search in the archives of the Water Supply and Boring Section of the Department of Mines and Resources of the logs of many thousand water-wells put down in Saskatchewan. They carefully noted the locations of all wells which had penetrated bed-rock and the depths at which the rock was encountered. These records went to the field to be fitted into the geologists' maps and augment his data.

With three geological parties and the core-drill crews employed, an area of more than 20½ million acres was covered in the years 1939-43 and the effort still goes briskly along.

During the 1940 season, a double-shift seismic crew entered the arena. This method of sub-surface investigation proved more effective than the gravity meter and has been used continuously since. In all some 5 million acres had been seismically surveyed to the end of 1943 and the parties are still in the field.

These united efforts, representing an examination of over $6,000 square miles or 35,000,000 acres of the Province in three years, brought to light a number of areas where structural conditions were favourable for the accumulation of oil, but that was as far as the geologist and the geophysicist could go; the "$64,000 question" as to the presence or absence of petroleum must always be answered by the driller.

Late in 1940 the Saskatchewan government took steps to encourage the raising of capital for an extensive oil search on a systematic basis and to assure efficient scientific development of any oil or gas field that might be discovered in the search. The government withdrew from ordinary leasing regulations a large area of land in southern Saskatchewan and provided that any interests willing to risk the large amounts of capital needed for detailed geological study, geophysical work and drilling could make a contract for a sizable reservation in the area and in consideration of their work and capital expenditures could within three years lease areas that were considered desirable. Norcanola Oil and Gas Limited, was one of the companies that took on this challenge. The shareholders in this Company include the Canadian Western Natural Gas, Light, Heat and Power Limited; Security Assets Limited; Oshel, Hammond, and Nanton Limited; and Consumers' Co-operative Refineries Limited, with Imperial Oil subscribing the largest part of the capital. Subsequently, Imperial Oil entered on its own account in the search for oil in the southern part of Saskatchewan.

Within the perimeter of these reservations there were thousands of acres on which the mineral rights had previously been alienated from the Crown and it was necessary for Norcanola and Imperial to secure reservations or leases from railway companies, land companies and private individuals to protect their operations. Of approximately 12½ million acres held by the two companies, roughly 80% is represented by Crown Reservations, the remainder being leased from, or reserved by private interests.

A start was made in May 1942 with the testing of the more promising structures by drilling, Norcanola's Radville No. 1 being spudded in. Rotary equipment was used and the hole was extensively cored, so that no promising horizon would be undetected. A certain amount of oil saturation was observed, but the well was ultimately abandoned in January 1943 at 7958 feet as a dry hole and a second test drilled nearby. It, too, failed to find oil.

Since Radville No. 1 Norcanola has also drilled Ogema No. 1, 9400 feet; Parry No. 1, 9437 feet; and Wilcox No. 1, 6372 feet; while Imperial drilled Dahinda No. 1, 5208 feet; and Lawson No. 1, 6420 feet. In no instance was production obtained, although there were, in some cases, those will-o-the-wisp indications which encourage drillers to keep trying. Accordingly, Norcanola drilled Radville No. 2 and is proceeding with Buffalo Gap No. 1.

Meanwhile the geologists continue to scour the prairies, delve into the coolness and gaze at the far horizons for every isolated rock exposure on which to morass; where outcroppings are not available, the core-drillers piece the over-burden for cores, which are given a scientist Third Degree to make them talk; the seismic crews manipulate their synthetic earthquakes to discover structural "highs" and the rotary drillers go about their appointed task of "making holes."

We have become so accustomed to astronomical figures that they perhaps fail to impress, but Norcanola's and Imperial's balance sheet for Saskatchewan is something like this:

| Area geologically surveyed and core drilled (1939-43) | 20,797,440 acres |
| Area surveyed by Gravity Meter (1940-41) | 10,897,920 acres |
| Area surveyed by Seismograph (1940-43) | 5,091,849 acres |
| Seven deep tests drilled by Rotary | 49,600 feet |

The geological and core drilling parties operate at a cost of around 11½ cents per acre; gravity meter surveys cost 5½ cents per acre and the seismic crews required about 7 cents an acre. Deep drilling and coring are rather expensive at approximately $29.00 per foot.

So far there is no definite answer to the question of Saskatchewan's oil possibilities; it is a gamble for high stakes, but the cost of sitting in on the game is also high.

Below——

More than 5,000,000 acres were surveyed by seismograph crews during 1940-43. This method of mapping sub surface structures by measuring reflections from boundaries on the surface proved most effective in Saskatchewan and parties are still in the field.

Above——

To provide geologists with samples of rock underlying the Saskatchewan prairie, hundreds of holes were put down varying in depth from a few feet to 900 feet. Portable core-drilling rigs of the type shown above were used.
THIRTY-FOUR MEN WHO LEFT THEIR WORK WITH IMPERIAL OIL LIMITED TO JOIN THE
ARMED FORCES HAVE GIVEN THEIR LIVES IN THE SERVICE OF THEIR COUNTRY

"... that from these honoured dead we take increased devotion to the cause for
which they gave the last full measure of devotion... that we here highly resolve
that these shall not have died in vain..."

Flight Sergeant Gordon Forbes Alger was reported missing on May 15, 1942
when his plane crashed into the sea while attacking a Nazi cruiser off the
cost of Holland. For official purposes he was declared dead on January 31,
1943. Flight Sergeant Alger was for-
mrly with Valley Pipe Line Company and enlisted in the R.C.A.F. on Septem-
ber 11, 1940.

Pte. Frederick Rushlow was killed at
Cears in Normandy on July 8th of this
year. Formerly with the Service regiment
Private Rushlow enlisted in the Kent Regiment on August 11, 1942.

Flight Sergeant I. G. Campbell was killed while on operational training in
England on February 13, 1942. Flight Sergeant Campbell was born in a
Statistical Clerk in the Winnipeg Office of
Manitoba Division. He enlisted in the R.C.A.F. on March 30, 1941.

Pilot Officer J. S. Bladen was killed while on an instructional flight at Dehli,
Mombasa, on July 29, 1942. Pilot Officer Bladen was formerly with the
Regiment Warhouse of Saskatchewan District, and enlisted in the R.C.A.F. on
June 23, 1941.

Lieutenant Commander W. F. Campbell died when H.M.C.S. "Lemhi"", a
corvette which he commanded, was sunk by enemy action in the Mediterranean in
February of 1943. Lieutenant Comman-
der Campbell, who was mentioned in
despatches, was formerly with Saskat-
chewan District at Regina, and enlisted in the R.C.C.R.V. on September 2, 1920.

Pilot Officer John Ronald Colman was killed while on operational over
enemy territory on December 6, 1941. Pilot Officer Colman was former-
ly with the Imperial Oil Limited in the R.C.M.F.R. on March 1, 1940.

Leading Aircraftman E. R. Crump was killed in a training flight at St. Johns, on
February 5, 1942. Leading Aircraftman Crump was formerly Senior Plant Clerk
at the Regina Warehouse of Saskatchewan District, and enlisted in the
R.C.A.F. on December 16, 1941.

Leading Aircraftman D. P. Found was killed in an aircraft crash over the
Franklin River, British Columbia on December 23, 1941. Leading Aircraft-
man Found was formerly with the Saskat-
chewan District at the Regina Ware-
house, and enlisted in the R.C.A.F. in
May, 1941.

Pilot Officer Richard B. Ives was killed on April 25th of this year while on
an operational flight near Garden River. Formerly Agent at Brandon, British
Columbia, Pilot Officer Ives enlisted in the R.C.A.F. in September, 1939.

Private Allen Lewis Keddy was killed in Italy on May 22 of this year. Private
Keddy was born in Manitoba and enlisted in the R.C.A.F. on February 11, 1943.

Pilot Officer W. J. Oliver was killed in action near Kama on October 6, 1943. Pilot Officer Oliver was formerly with the
Service regiment and enlisted in the R.C.A.F. on October 6, 1941.

Pilot Officer W. J. Rogers was killed on
service in England on January 30th of this
year. Formerly with the Technical and Research Department of
Imperial Oil Limited at St. John's, Pilot Officer Rogers enlisted in the R.C.A.F. on
July 20, 1941.

Flying Officer George M. Milne was listed as missing on January 19, 1942, in a
train crash in England. He officially declared dead on October 4, 1942. Flying Officer Milne was formerly with the Valley Pipe Line Company, and enlisted in the R.C.A.F. on May 30, 1941.

Sister G. C. Mollie died of disease at
Winnipeg on December 9, 1942. Sister Mollie was formerly nurse and
matron of the Ladies Office of
Dundurn Division, and enlisted in the R.C.A.F. on February 20, 1942.

Pilot Officer H. Paul Morris was killed on December 24, 1943 when his plane
crashed in England when returning from a bombing raid on Berlin. Formerly with the Service regiment Pilot Officer Morris enlisted in the R.C.A.F. on July 10, 1943.

Leading Aircraftman W. F. Rees was killed when the bomber on which he was
second pilot failed to return from a
flight over enemy territory on the night of November 9, 1943. Squad was later reported missing. Leading Aircraftman Red Cross was buried on the Isle of Lewis, North Uist. Leading Aircraftman Rees was formerly with the Regina regiment, and enlisted in the R.C.A.F. on October 6, 1941.

Flying Officer W. J. Rogers was killed on service in England on January 30th of
this year. Formerly with the Technical and Research Department of
Imperial Oil Limited at St. John's, Pilot Officer Rogers enlisted in the R.C.A.F. on
July 20, 1941.

Flying Officer Victor Rizzuto was killed in April of this year while on an oper-
atonal flight between Victoria, B.C. and Seattle, Washington. Leading Aircraftman Rizzuto was formerly with the Victoria office of the
Service regiment, and enlisted in the R.C.A.F. on April 26, 1941.
Sergeant F. E. B. Staines was reported missing June 2, 1942, on an operational flight over lower Germany. For official purposes he is presumed dead. Sergeant Staines was formerly a Cadet in the Winnipeg Office of the Regina office of the Saskatchewan Division, and enlisted in the R.C.A.F. on February 14, 1941.

Pilot Officer James R. Shanks was killed while on an instructional flight at Rockcliffe, Ontario, on October 31, 1942. Pilot Officer Shanks was formerly with the Technical and Research Department of Services and joined the R.C.A.F. on November 20, 1941.

Squadron Leader James G. Brown was reported missing on June 14, 1943, on a flight over the Bay of Biscay on which he was flying a Sunderland. His whereabouts remain unknown. Squadron Leader Brown was formerly with the Technical and Research Department of Services and joined the R.C.A.F. on May 19, 1940.

Sergeant Pilot Leslie Gordon Sutherland was reported missing on June 24, 1943, after air operations over Germany, and he was officially presumed missing on May 17th of that year. Formerly with the Services, Sutherland joined the R.C.A.F. on March 12, 1940.

Squadron Leader Lawrence Taylor and five others, were reported missing in England on August 17, 1943, while returning from an operational flight. Formerly with the Royal Air Force Company, Sergeant Taylor joined the R.C.A.F. on November 25, 1940.

Lieutenant L. C. R. Tucker died of injuries received while on a training flight in England in September 1940. Tucker was an Aircraftman 2nd Class in the Royal Canadian Engineers on September 14, 1939.

Squadron Leader R. S. Wray was killed in action over France on August 6, 1944. Squadron Leader Wray was formerly with the Industrial Sales Department of Imperial Oil and enlisted in the R.C.A.F. in August of 1940.

Flying Officer Kenneth White lost his life in a mid-air collision with another North West Germany territory. For official purposes he is presumed dead. Flying Officer White was formerly with the Winnipeg Office of Manitoba Division, and enlisted in the R.C.A.F. on May 6, 1940.

Warrant Officer R. S. Wrayley lost his life while on air operations over Germany on February 25, 1943. Warrant Officer Wrayley was formerly with the Montreal Office of Quebec Division, and enlisted in the R.C.A.F. on November 4, 1940.

Sergeant Pilot Leslie Gordon Sutherland was reported missing on June 24, 1943, after air operations over Germany, and he was officially presumed missing on May 17th of that year. Formerly with the Services, Sutherland joined the R.C.A.F. on March 12, 1940.

Flight Sergeant R. Fraser Thompson was killed after bombing operations at El Alamein, Egypt, on June 27, 1942. Flight Sergeant Thompson was formerly with the Inspection Laboratory at Regina and enlisted in the R.C.A.F. on July 9, 1940.

Lieutenant L. C. R. Tucker died of injuries received while on a training flight in England in September 1940. Tucker was an Aircraftman 2nd Class in the Royal Canadian Engineers on September 14, 1939.

The history of artificial illumination began with man's first use of fire. Probably a burning brand from a camp fire first carried light into the darkness. In time more efficient torches were discovered. The body of a fat bird or fish impaled on a stick and held too close to the fire may have burst into flame producing a smoking, sputtering but longer lasting and more brilliant torch. Other torches were made from resinous gum wrapped in leaves or from fibers and rushes soaked in grease or fat.

The candle and lamp developed from the torch. A fiber wick wrapped about a mass of fat on a stick was probably the first candle. The first lamps were used in the bronze age. These were essentially shallow vessels of stone, pottery or bronze containing a liquid fat or oil. Wicks of moss or pith arranged on the edge of the saucer or placed in pinched up gutters drew the oil to the flame. In time the open saucer was closed and the gutter became a wick-holding socket. Not until comparatively recent times were the luminaries of smoked, small light power and food operation overcome by the addition of chimneys, wicker wicks and other features of modern oil burning lamps.

The fuels for lamps have been any oils that would burn in them. Fuels used extensively from the 16th century to almost the 20th century were whale oils, known in the 19th century as "Tung Oil" and "Spermac Oil". About the middle of the 19th century it became apparent that whales could not supply the demand for illuminating oils, and many efforts were made to discover other sources of oil for lamps. In England, Dr. Young developed a method of producing an oil from coal itself called "rivalling sperm oil in readiness and brilliancy of combustion". Another lamp oil was "Camphene", a redistilled turpentine. In 1855, Dr. Abraham Guerier of Nova Scotia patented a process for producing a lamp oil from coal. This coal oil was given the trade name "Kerosene". Many companies used Dr. Guerier's and Dr. Young's patents to produce illuminating oils from coal.

Then in 1859, Drake send the oil well that made it possible for everyone to "burn the midnight oil". In the years immediately following, petroleum meant oil for lamps and nothing else, and the first refiners sold their illuminating oils under the name "Kerosene", adopting the trade-name used by the manufacturers of illuminating oil from coal.

REFINING

While kerosene is the name frequently used to describe oil for lamps, it is only one of several petroleum oils used for illuminating purposes. The general term for such oils is "illuminating oils". The illuminating oil fraction is distilled directly from the crude in the crude bubble tower. The boiling range of the fraction obtained may be adjusted by changing the operation of the distillation unit or by redistillation. The fraction is a side stream product which is passed through a steam stripper to remove unwanted lower boiling point components. It may then be sent to temporary tankage before further treating.

TREATING

The further treating may consist of (1) Chemical treating, or (2) Catalytic treating. One of the methods of chemical treating is carried out in essentially the same way as nitrobenzene is lead-benz treated, as described in article No. 7 in this series. If hydrogen sulphide is present, the treating medium is a base solution. If mercaptans are present a lead-acid solution is required. If unwanted aromatics as well as sulphur compounds are present other treating substances such as sulphuric acid must be used. Usually after lead-benz treatment, and always after acid treating, the product is redistilled.

As in the case of asphalt, lye or lead-benz treating of illuminating oils may be carried out in a continuous fashion or in batch agitators. Acid treating of illuminating oils is carried out in much the same manner as described for lubricating oils.

In catalytic treating the illuminating oil fraction is heated to a temperature higher than necessary to
FUEL OILS

ALL petroleum fractions, from gas to asphalt, may be heated to produce heat; the fractions up to and including gas oil may be burned for either heat or power. The gas in a gas engine generates power and heat while the gas in a gas stove produces heat only. Gasoline is the source of power for gasoline engines, and is the source of heat in a Primus Stove. Illuminating oil may be used as power kerosene in a tractor or as the source of heat in an incubator. Similarly types of gas oils may be used as Furnace fuel oil to produce heat, or as Diesel fuel oil to generate power. In this article the term “Fuel Oil” refers to the liquid petroleum products that are burned to produce heat.

The production of gasolines and illuminating oils, which may at times be used as fuel oils, has been described in previous articles. Stove oil is obtained from crude and follows illuminating oil in the distillation series. It is a fuel oil used in the so-called “Coal Oil Stoves” so familiar in summer cottages. This product is produced in the same manner as illuminating oils, and differs only in having a somewhat higher boiling range.

The products usually considered as fuel oils are Furnace Fuel Oil, Gas Oils for gas making and water-gas enrichment, Light Industrial Fuel Oil, Medium Industrial Fuel Oil, and Diesel Fuel Oil. In general, these fuel oils must produce a maximum amount of heat with the least inconvenience to the user.

In the lighter grades of fuel oil boiling range is important in that it determines in part the ability of the fuel to burn readily without excess carbon formation. Sufficient “front end” or low boiling hydrocarbons must be present to permit the oil to be ignited easily. Too much “tail” or too many high boiling components will tend to form carbon. The poor point and volatility of the fuel oils are also important since these control the ability of an oil to flow. The gravity of the fuel oil is an indication of its heat content.

FURNACE FUEL OIL

Furnace fuel oil, also known as domestic fuel oil, is the source of heat in home-heating plants. In order that domestic oil burners give trouble-free service with a minimum of maintenance, the furnace fuel oil must be carefully refined. The starting point in the refining operation is the withdrawal of a gas oil side stream from the crude bubble tower. The operation of the tower is adjusted to yield a side stream product with a boiling range of approximately 400°F to 650°F.

The fraction as obtained from the crude bubble tower frequently contains corrosive sulphur compounds, such as hydrogen-sulphide, which must be removed. This is done by pumping the furnace fuel oil into an agitator where it is mixed with a dilute lye solution. The agitator and the manner in which it is used is similar to that described in previous articles. After an hour’s agitation the spent lye solution is allowed to settle. It is then drawn off, and water is introduced to wash the furnace fuel oil by further agitation. When chemical tests indicate the oil is washed free of impurities, the water is withdrawn and air blown through the oil until the last traces of moisture are removed. When all moisture is removed the oil is said to be “bleached bright”. The oil, now chemically stable, dry, clean, and non-corrosive, is pumped to storage.

LIGHT INDUSTRIAL FUEL OIL

Light industrial fuel oil is used as the source of heat in bake ovens, pottery furnaces, heat-treating furnaces, and other industrial heating units where precise control of the temperature is necessary. This fuel oil is a gas oil usually obtained from the bubble tower distilling the products from the cracking coils. The production of this fuel oil was described in the second article of this series “Production of Fuels for Internal Combustion Engines”.

As a rule, the fraction as withdrawn from the cracking bubble tower is used directly for storage as a finished product. Since it is a cracked product, it differs chemically from furnace fuel oil, but resembles it in heat efficiency. The inclusion of higher boiling components gives it a wider boiling range, thus making it a heavier fuel oil.

MEDIUM INDUSTRIAL FUEL OIL

Medium industrial fuel oil is a still heavier fuel oil. It is used essentially for the same purposes as light industrial fuel oil, but is used in burners of a different type. It is made by blending light industrial fuel oil with a relatively small amount of residual fuel oil.

RESIDUAL FUEL OIL

Residual fuel oil may be reduced to crude or cracked residues. The residues from all other fuel oils, that is, they are products that have been distilled overhead. A residual fuel oil as produced from a crude is reduced from the crude the gasoline, kerosene and sufficient of the gas oils fractions to yield a residual material with the viscosity character-istics required in a heavy fuel oil.

The distillation of cracked gasoline and cracked gas oils from the total product produced by the cracking coils leaves a residual material similar to the residual fuel oil produced from crude. Residual fuel oil is used by industry for steam generation, blast furnaces, heat-treating, etc. It is the fuel used to a
large extent in petroleum refineries for heating stills and similar purposes. It is the usual fuel for oil-burning steam driven ships. The use of residual fuel oil for ships was developed prior to the many industrial applications which are now common, and it was this primary use which gave to residual fuel oil the general name of “Bunker” fuel oil.

WAXES

THE term “wax” describes several substances very different in chemical composition but all more or less resembling the first known wax—beeswax. The so-called “waxes” are essentially chemical combinations of large alcohol molecules with large organic acid molecules. Such chemical compositions are found in beeswax, which makes up the honey comb of bees; carnauba wax, which is exuded from the leaves of the carnauba palm tree (Brazil); and montan wax which is extracted by means of volatile solvents from brown coal. Among the many wax-like substances to which the term “wax” is applied are Japan wax, which is a hard fat from the berries of the lac tree (Japan, China); ozokerite or earth wax (refined ozokerite is called ceresin) which is a naturally occurring hydrocarbon wax (Poland); and paraffin wax which is obtained from crude petroleum.

WAXES IN PETROLEUM

The occurrence of wax in crude oil depends on the geographical source of the crude. Naphthenic crudes such as Colombian contain only a trace of wax. Lubricating oil distillates from mixed base crudes such as Mid-Continent and paraffinic crudes such as Pennsylvanian contain from 7% to 15% of waxes. Certain crudes contain exceptionally large amounts of wax. For example, lubricating oil distillates from San Joaquín (Venezuela) and Talang Akar (East Indies) crudes contain 30 to 55% commercial paraffin waxes; a crude from a field near Palenbang (Sumatra) yields a lubricating oil distillate containing 45 to 55% paraffin wax.

The waxes in petroleum boil at the same temperature as lubricating oils and thus occur as components of the gaseous lubricating oils. There are many different wax hydrocarbons, each with its particular boiling point. Thus the waxes that distill over with light lubricating oil distillates are different from those that distill over with intermediate or heavy lubricating oil distillates. Waxes with still higher boiling points than those occurring in heavy lubricating oil distillates remain with the oily constituents of the asphalt bottom product obtained by vacuum distillation of reduced crude.

Although there are many kinds of waxes, they can be roughly divided into two chief groups known as “Paraffin Waxes” and “Amorphous Waxes”. The most distinguishing difference between them is the size of the wax crystals that are formed when they solidify. Paraffin waxes are composed of relatively large crystals while amorphous waxes are composed of exceedingly small crystals. Actually, no sharp distinction can be made on crystal size since waxes, depending on the hydrocarbons concerned, have crystals varying in size from relatively large crystals to no crystals at all. Actually only non-crystalline waxes are truly amorphous.

The term Paraffin Wax refers strictly to all the members of the normal paraffin hydrocarbon family that are solids at ordinary temperatures. These hydrocarbons are the large members of the family that starts with methane, ethane, etc. They contain from 16 to an estimated 70 carbon atoms per molecule. Until recently, the only wax hydrocarbons of this family that were recovered on a commercial scale were those occurring in light lubricating oil distillates. These waxes contained from about 20 to 31 carbon atoms per molecule. As a result, the term Paraffin Wax frequently brings to mind only this relatively small group of hydrocarbons.

The introduction of solvent dewaxing as described in Article No. 4 made possible the commercial separation of the waxes from intermediate and heavy lubricating oil distillates as well as from light lubricating oil distillates.
eating oil distillate. These waxes are relatively new to the wax market and differ considerably in their properties. The wax from intermediate lubricating oil distillate known as “Pare Wax” consists of approximately 40% normal paraffin hydrocarbons averaging 35 carbon atoms per molecule. The wax from heavy lubricating oil distillate known as “Dark Wax” consists of about 20% normal paraffin hydrocarbons averaging 43 carbon atoms per molecule.

The term Amorphous Wax is more or less a catch-all for waxes not composed of normal crystalline paraffin hydrocarbons. They make up the rest of Pare Wax and Dark Wax. They also are the wax components of petroleum which is a naturally occurring mixture of these waxes and heavy lubricating oil obtained in the dewaxing of cylinder oils.

As described in Article No. 4 wax is removed from raw lubricating oil fractions or distillates by solvent dewaxing. In this process the wax oil is dissolved in a solvent and then chilled until the wax crystallizes out. The crystallized wax is then filtered from the solvent oil. The wax so obtained is passed through a still where the solvent it contains is removed by distillation. The resulting raw or crude wax is a mixture containing about 10% of oil and many individual waxes with melting points from 60° up. The heavier the lubricating oil distillate being dewaxed, the higher is the upper limit of the melting point of the wax.

The crude wax from intermediate and heavy lubricating oil distillates are not subdivided. These are the Pare Wax and Dark Wax Waxes mentioned above. The familiar waxes of commerce are those produced by the sublimation and refining of crude wax from light lubricating oil distillate.

WAX SWEATING

Commercial Paraffin Waxes are produced by a process known as “Sweating”. In this process a cake of raw or crude wax is slowly warmed to a temperature where the oils and unoxidized low melting waxes are sufficiently fluid to flow through the spaces between the relatively large and still solid crystals of the desired, higher melting wax. The higher the sweating temperature attained, the higher is the melting point of the wax residue left behind. The sweating operation is carried out in a “sweater” which is essentially a brick oven, approximately 90 feet long, 15 feet wide, and 15 feet high. Stacked shallow pans almost fill the sweater. Each pan is equipped with pipe connections whereby heated oil or water may be added to, or removed from each pan. Pipe coils in the pans carry cold or hot water which controls the temperature of the wax as required. A wire screen is stretched across each pan just above the bottom to hold the wax cake off the bottom, thus allowing a drainage space. The pans are tilted slightly to allow water or wax to flow to drain pipes.

The sweater is charged by first flowing cold water into the pans to a level just below the wire screen. Molten wax is then flowed on top of the water. Cold water in the pipe coils solidifies the wax. The water below the screen is then drained off, and the wax cake remains suspended on the screen. Each sweater oven can handle 200 to 500 barrels of wax depending on its size.

The doors which make up practically the entire front and back of the sweater are closed. Steam is then passed through pipe coils lining the walls of the sweater and hot water through the coils embedded in the wax cake. By these means the temperature of the wax is slowly raised during a period of two or three days. As the temperature of the wax cake increases at a rate of 8% to 10% per hour, the non-commercial oil and low melting waxes in the cake liquify and drip into the pans. This material which exudes or “sweats” from the wax is called “Foods oil” and is pumped to the cracking coils. When the melting point of the material dripping from the wax cake reaches 100°F, it is allowed to run into a nearby storage tank where it is called “Interfoot”. When the melting point of the wax cake reaches 110°F, the material dripping into the pan is called “Scale” wax and is diverted to yet another tank. The sweating process is continued until the oil content and melting point of the wax exuded remaining on the screen has reached the specifications of a commercial grade of wax. This wax is referred to in the refineries as “sweetened wax”.

Live steam is then blown into the space below the screen to melt down the sweetened wax. The latter is then pumped to a steam jacketed agitator where it is washed. (Continued on page 24)

N. E. A. HLY 500 employees of Imperial’s Montreal East refinery and several score from the marketing offices in Cote St. Paul gathered on the afternoon of August 31st to say “au revoir” to F. C. Mechin, General Manager of the refinery, who is being transferred to Toronto to take the position of Assistant to the President in charge of employee relations.

The gathering was held on the lawn west of the refinery’s personnel offices and was a tribute to the esteem in which Mr. Mechin is held by his fellow workers. The visitors took the opportunity to commemorate also the 25th anniversary of Mr. Mechin’s wedding by presenting to him and Mrs. Mechin a handsome silverware service. This presentation to Mr. and Mrs. Mechin was made by W. H. McAllister. A fine gold watch was presented to Mr. Mechin on the workers’ behalf by L. Laberge, Chairman of the elected delegates of the refinery’s industrial council. S. R. Perault, the first man employed when construction of the Montreal East refinery was begun in 1916, handed Mr. Mechin an illuminated scroll bearing the signatures of all workers.

The occasion was made more memorable by the presence of R. V. LeSueur, President of the Company, who addressed the crowd, outlining the company’s aggressive and progressive policies which it is hoped will maintain continued employment after the war. Mr. LeSueur pointed out that all the jobs of all the people present combined to make a great organization. He counseled as a motto for this and future times: “turn every difficulty into an opportunity”.

Referring to Fred Mechin as “a friend of all of you here” he beseeched for R. L. Dunsman, who succeeds as general manager of Montreal East “the same cooperation and support you have always given to Fred Mechin.”

Mr. LeSueur emphasized that it is as much in the employees’ interest as it is in the interest of the employee that work be given every possible benefit and advantage.

In making the presentation on behalf of the workers J. Laberge paid tribute to the advanced policies of Imperial Oil in the interest of its workers, citing pensions, benefits, group insurance, hospitalization, etc. and he drew applause when he said the workers would resist any interference with the harmonious relations which have continually prevailed in the plant between employees and management.

Prior to the presentation visitors flanked with the industrial council and the supervisory staff of the refinery. Among the visitors were H. H. Hewetson and G. L. Stewart, vice-president; J. H. Bubly, manager of the Marine Department; J. R. Simpson, president of the Montreal Pipe Line Company, and W. T. A. Bell, Manager of the Quebec Marketing Division, and H. M. Powell from Ottawa.

The following day employees of Cote St. Paul Marketing Plant gathered to meet Mr. LeSueur as on his recent visits to other marketing and refining points in the West. Mr. Bell presided and Mr. LeSueur outlined the scope of the company’s operations and the traditions of the Imperial Oil family. Mr. Hewetson thanked Mr. LeSueur and other visitors and emphasized the results achieved by loyal cooperation in all ranks and branches of the company.
C. E. Carson Appointed General Manager of Refineries

Formerly general superintendent of Sarnia refinery, C. E. Carson has been appointed general manager of refineries.

Cecil Carson was born in Montreal, and received his education there, graduating as a Bachelor of Science in Chemical Engineering from McGill University in 1922. His career with Imperial Oil Limited began in 1923, when he became a laboratory assistant at the Montreal East refinery. In 1929, he was appointed assistant to the refinery superintendent at Montreal.

In 1933 Mr. Carson went to Regina as refinery superintendent, and in 1934 was appointed general superintendent of Sarnia refinery. He served in this latter capacity until his recent appointment as general manager of refineries.

J. D. Bradley Appointed General Superintendent at Sarnia

J. D. Bradley, formerly superintendent of Sarnia refinery, has been appointed general superintendent at Sarnia.

A native of Sarnia, Dean Bradley joined Imperial Oil Limited in 1912. His first job was filling and packing grease. A few months later he was transferred to the accounting department and was successively employed as gauger, timekeeper, head timekeeper and in the cost and yield department.

In 1923 he was transferred to the manufacturing department and appointed process foreman. In 1931 he was appointed assistant to G. L. Stewart who was then superintendent of Sarnia refinery. In 1934 he became superintendent at Sarnia refinery and served in this capacity until his recent appointment.

O. C. Wheeler Appointed Chief Geologist

O. C. Wheeler has been appointed chief geologist of Imperial Oil Limited.

"Jimmie" Wheeler joined the Company in 1921 as a field geologist for the Tropical Oil Company in Colombia and after two years was appointed head of the Geological Department for Tropical. In 1929 he was transferred to the Geological Department in Toronto and in 1937 became chief geologist for the International Petroleum Company. For the past several years Mr. Wheeler has also served as assistant chief geologist of Imperial Oil Limited.

W. J. Whitting Retires

W. J. Whitting, Secretary-Treasurer of Imperial Oil Limited, retired on June 30, under the Company’s annuity plan.

Mr. Whitting’s entire business career was spent in the oil industry. He had his early training in Pennsylvania and in 1916 joined the staff of Imperial Oil in the cost and yield department at Sarnia. A few months later when the executive offices of the company were moved to Toronto, Mr. Whitting went to that city where he remained until March, 1919, when he was appointed assistant in the financial statements department at head office and so returned to Sarnia. In December, 1930, he was made assistant secretary-treasurer, and in 1935 was appointed secretary-treasurer.

O. B. Hopkins Appointed a Vice-President

O. B. Hopkins, B.Sc., has been appointed a Vice-President of Imperial Oil Limited in charge of producing operations.

Dr. Hopkins joined Imperial Oil in 1919 at the beginning of its exploratory operations in Alberta and the Northwest Territories and was in charge of a geological party operating from the Athabasca to the Peace River. In 1939 he went to Colombia to evaluate the DeMaree concession which was subsequently acquired by International Petroleum interests, and on his return to Canada in 1931 was appointed chief geologist of Imperial Oil. In 1933 Dr. Hopkins was elected to the directorate of International Petroleum Ltd.

F. C. Mechin Appointed Assistant to the President in Charge of Personnel

Formerly manager of Imperial Oil refinery at Montreal, F. C. Mechin has been appointed assistant to the president to take charge of personnel matters. Mr. Mechin joined Imperial Oil in 1916 as assistant manager in charge of construction of the Montreal East plant. In 1917 he was appointed engineer in charge of construction of the Halifax refinery and later that year went overseas, returning to Halifax in 1919. In 1923 he took charge at Montreal East. Until recently Mr. Mechin has been on loan to the Government as Director of Protection of Petroleum Resources.

P. F. Shannon Elected President

P. F. Shannon, who succeeds the late John McLeod as President of the Royalite Oil Company Limited, has had wide experience in the producing end of the oil industry. Nearly all his business life has been spent in the oil industry with the exception of a period when he served with the A.E.F. in France.

After demobilization Mr. Shannon became Superintendent of the Continental Oil Company. From 1924 to 1928 he was professor of Petroleum Engineering at the Colorado School of Mines and left that post to become Field Superintendent of the Tropical Oil Company at Barrancabermeja in Colombia in November 1928. In May 1933 he was made Manager of all Tropical Oil Company’s producing operations in Colombia.
A. C. Harrop Appointed Superintendent at Sarnia

Formerly Superintendent of Calgary Refinery, Alan C. Harrop has been appointed Superintendent of the refinery at Sarnia.

Alan Harrop’s entire business career has been spent with Imperial Oil Limited. Graduating from the University of Toronto with a Bachelor of Science in Chemical Engineering in 1925, he joined Imperial Oil Limited in the same year. His first position was that of laboratory assistant at Calgary refinery, and in 1929 he was appointed Chief Chemist there.

In 1937 he was sent to Peru as Chief Chemist of the Talara refinery. Returning to Canada he was appointed superintendent of British Columbia refinery in 1936. In 1940 he was appointed Superintendent of Calgary Refinery and served in this capacity until his recent appointment.

S. B. Scott Appointed Assistant Comptroller

S. B. Scott has been appointed assistant comptroller of Imperial Oil Limited.

Scott Scott was born in Besley, Kent County in England and received his secondary and university education there. Coming to Canada, he joined Imperial Oil Limited in January of 1919. His first task was to survey the company’s marketing and accounting system and in 1922 he became assistant in charge of the marketing and accounting office at Sarnia. He was appointed assistant treasurer in 1935 and in 1940 was appointed assistant secretary-treasurer.

J. H. Spence Appointed Assistant Comptroller

J. H. Spence has been appointed assistant comptroller of Imperial Oil Limited.

Born in Port Perry, Ontario, Howard Spence moved to Toronto at the age of 12 and received his secondary education there. His career with Imperial Oil Limited began in 1928 when he became chief accountant and office manager of The Domestic Storage and Forwarding Company, an Imperial subsidiary at that time.

In 1932 he was transferred to Sarnia as an accountant in the Treasurer’s Office and in July of 1933 was appointed chief accountant responsible for corporate accounting. He served in this capacity until his recent appointment.

Dr. T. A. Link Appointed Assistant Chief Geologist

T. A. Link has been appointed assistant chief geologist of Imperial Oil Limited, succeeding O. C. Woolner who becomes chief geologist.

Theodore Link joined Imperial Oil Limited in 1919 and headed, the party which sank the first well at Norman in 1923. Dr. Link worked in the Norman area and in various parts of Alberta until 1927 when he was transferred to Colombia. Two years later he returned to Canada as resident geologist at Calgary.

When Canal was inaugurated, Dr. Link was appointed chief geologist of the project and served in this capacity until spring of this year.

J. A. Brown Presented With 40-Year Service Button

At a dinner given in his honor by fellow employees James Allan Brown, former of the boilermakers’ and welders’ departments at Halifax refinery, was presented with his forty-year service button by C. Szymegor, superintendent at Halifax.

James Brown joined the Company in May, 1925 at Sarnia and participated in the building of Montreal refinery and many of the Company’s large marketing stations. He was transferred to Halifax in May of 1927.

“Brownie”, as he is known to the older employees, has contributed much to the Company’s successful operations at Halifax refinery, not only in the line of his duties but as a veteran of Imperial championship baseball and bowling teams.

Richard Brown Retires

After 47 years of service with the Company, Richard Brown retired on October 1st of this year.

Mr. Brown was born in Embden, Nova Scotia, on January 10, 1890. His family moved to Sarnia in 1890 and Mr. Brown has resided in Sarnia since that time.

Richard Brown’s association with Imperial Oil began on July 4th, 1917 when he was employed by a contractor who was engaged in constructing storage tanks at Sarnia refinery. Upon completion of this work he was employed at the refinery on September 1. For a year he did general work and from 1898 to 1936 was employed as an operator on various processing units. He was then appointed a weight master and served in this capacity until his retirement.

T. W. B. Copeland Presented With 40-Year Service Button

For 40 years Imperial Agent at Berline, Manitoba, T. W. B. Copeland was presented with his 40-year service button at a banquet held recently in his honour by the Company and his fellow employees.

Tom Copeland came from Dufus, England to Canada and Berline in 1888, and joined Imperial Oil Limited as Agent at Berline on September 20, 1903. During the 40 years that Mr. Copeland was agent at Berline he was very active in community affairs, serving on the Berline council for over 30 years and on the school board for 15 years.

P. W. Storey Presented With 40-Year Service Button

Officials of Imperial Oil Limited and a number of friends gathered recently to honor P. W. Storey, Resident Manager at Moncton, N.B., on the occasion of his completion of forty years in the company’s service.

J. G. Dunlop, Maritime Divisional Manager, presented Mr. Storey with his forty-year button. In a brief address Mr. Dunlop stated Mr. Storey joined the Company in July, 1924, and in working his way up the ladder has played a part in building the great growth of the company.

In concluding Mr. Dunlop stated that during the years of his employment with the company, Mr. Storey has been an excellent citizen, as evidenced by the fact he is now serving his fifth year as mayor of the City, and prior to being elected to the mayoralty served for almost a decade as alderman.
"MEN WHO GO DOWN TO THE SEA" ... continued from page 3

any drawings and with only the tanker experience of the Imperial men as a guide, a cargo vessel was turned into a tanker. A number of other vessels of Canadian and United States flags were subsequently converted and proved of great value in the war of transportation. Most of the converted Canadian vessels were operated by the company.

Imperial marine men played a big part in training men for the Royal Canadian Navy. At the outbreak of war the Navy needed a greatly enlarged personnel to man naval vessels then going into commission. Approximately sixty-five men of the Imperial tanker fleet transferred to sea service, twenty-four of whom were officers and engineers thoroughly trained in engine room and on deck. The remaining men entered as ratings. They entered the service at a time when they were urgently needed to train new-comers in the rapidly growing Canadian Navy.

C. E. CARSON HONOURED ... continued from page 5

Mr. LeBauer said that these developments in a large part are a result of the close co-operation which has existed between the workers and the management, and emphasized that this would continue. He promised a continued aggressive policy in the company's operations and said that planning for the post-war period indicates that all workers returning from the armed forces can be absorbed and it is hoped that the expanded employment since the war will also be maintained.

The presentation committee for the afternoon assembly included Lieut. Col. S. G. Stokes, M.C., V.D., Charles R. Cole, William Oberg, Joseph A. Dione, Horace E. Page, A. V. Humphries and Hubert L. Bate. The presentation was made by Mr. Carson.

Recognition of the part played by the men of the Imperial Oil Marine Department was expressed recently with the award of decorations to five men of the Imperial tanker fleet. They are: Captain Herbert Lawson Thomas, Captain George Vincent Thomas, Chief Engineer Robert Davidson Knox, Seaman First Class Mathew DeWode, and Boatswain Alexander Caswell Watson.

In addition to the awards made to the Imperial tanker men, awards have been received by three former Imperial marine men who are now serving with the Royal Canadian Naval Reserve. They are: Lieutenant Commander William Woods, Lieutenant Commander E. John Bulmer, and Stoker Petty Officer Hugh Scott. Also an award was made to Captain Louis Herbert Dicks, formerly with Imperial's Marine Department and now serving in the Merchant Navy.

REFINING ... continued from page 18

is blown dry and mixed with clay (Fullers Earth). After the clay is allowed to settle, the wax is pumped from the agitator and through filter papers in a filter press. Here traces of clay in the wax are removed. The wax is then known as "refined wax". The spent clay remaining in the agitator cone is mixed with water and pumped away for disposal.

The "refined wax" is then mixed with coking asphalt parts, pumped back to the sweater and reswaged. This is done to recover the commercial waxes which escaped from the original wax cake during the original sweating.

The non-commercial oils and waxes produced in the re-sweating operation are sent to the cracking coils as more "fats oil".

Combination of the various saturated waxes obtained, and the control of the sweating operation, yield a variety of commercial waxes which differ in the temperatures at which they will melt. These waxes, after the clay-treat, are pumped to a moltenizing machine where they are cast into blocks or candles or to a "chipper" where flaked wax is made prior to packaging in barrels.

IMPERIAL OIL REVIEW

IMPERIAL EMPLOYEES DECORATED

FLIGHT LIEUTENANT DAN KING, D.F.M., D.F.C.

Formerly with the Warping office of Montreal Division, Flight Lieutenant Dan King has been awarded the Distinguished Flying Cross. In addition to the D.F.C., Flight Lieutenant King holds the Distinguished Flying Medal, awarded to him in February of 1933 for outstanding work as a lumber aimer over enemy territory.

Dan King joined the R.C.A.F. in February of 1941 and went overseas in March of 1942. It was after his first tour of 30 operational flights that he secured the D.F.M. Promoted to Pilot Officer, he was on instructional duty for about five months, and then went back to operational duty, completing another tour of 30 operational flights over Germany. He was promoted to Flying Officer in November of 1943, and to Flight Lieutenant in February of 1944.

FLYING OFFICER JAMES R. LAWS, D.F.C.

Formerly with the inspection laboratory of Imperial Oil Limited at Sarnia, Flying Officer James R. Laws has been awarded the Distinguished Flying Cross. The citation reads as follows: "Pilot Officer Laws has taken part in a large number of operational sorties against some of the enemy's most heavily defended targets including Hamburg, Frankfurt, Turin, Genoa, Bruxelles, Cologne, Essen and Dortmund. Undoubtedly the excellent results obtained by his crew were largely due to the skill and determination of this officer to press his attacks home regardless of the heaviest opposition. As assistant bombing leader the high standard of efficiency of the bomb aimers in the squadron is directly attributable to the untiring efforts and enthusiasm of Pilot Officer Laws."

James Laws joined Imperial Oil Limited in July of 1937. Enlisting in the R.C.A.F. in December of 1940, he graduated at Lethbridge, and arrived overseas on Christmas Day of 1941. He is now on his second tour of operations.

FLYING OFFICER PAUL RACKHAM, D.F.C.

Formerly with the Halifax office of the Maritime Division, Flying Officer Paul Rackham has been awarded the Distinguished Flying Cross. The award was made after Flying Officer Rackham had participated in a successful encounter with two U-boats.

The attack occurred in March of this year. Flying Officer Rackham's aircraft was hit by anti-aircraft fire from the first U-boat and one engine set alight but the pilot released depth charges which enveloped the submarine. The second U-boat was sighted shortly afterwards, while the aircraft was burning. The plane was again hit by withering fire and Flying Officer Rackham (the Navigator) was wounded in the head, body and leg. Despite his acute suffering, Paul remained at his post and performed his duties, and the plane was landed safely in Britannia Bay.

His citation reads in part: "The aircraft was repeatedly hit and sustained extensive damage. Flying Officer Rackham was wounded in the head, body and leg but bravely remained at his post to continue his navigational duties. Throughout the long flight home the aircraft was difficult to control, but P/O L. Kernigan (the Pilot) flew it safely to this country. This officer displayed outstanding skill, courage and determination in the fight against the enemy's underwater craft. Flying Officer Rackham also proved a gallant and resourceful member of aircraft crew. Although suffering acutely he did everything within his power to assist his pilot to reach home."

Paul Rackham left the Company to join the R.C.A.F. in June of 1940. On graduation he was posted overseas.

After his recent hospitalization he was sent to a convalescent camp in Scotland and thereafter was given a short furlough. He is now back on duty with the R.C.A.F. Bomber Squadron located in Northern Ireland.

SEQUENTIAL 5.5.2. GARTLAN, AIR MEDAL

Formerly with the Toronto Office of the Ontario Division, Sergeant Charles G. Gartlan, United States Army Air Force, has been awarded the Air Medal, according to dispatches received from a honor roll in Europe. The citation reads as follows: "For exceptionally meritorious achievement while participating in strike operations against important industrial and military objectives in Germany and Italy.

Charles Gartlan joined Imperial Oil Limited in 1938 and joined the Royal Canadian Air Force in July of 1941. For reasons of health he was medically discharged from the R.C.A.F. and later when his health had improved he enlisted in the United States Army Air Forces.
It Doesn't Leave a Lot for the Civilian

WHEN war demands have been filled . . . when invasion gasoline, aviation gasoline, Navy fuel oil, petroleum for the manufacture of explosives, synthetic rubber, and gasoline for war industry, farming and essential trucking all have been taken from Canada’s oil supply—it doesn’t leave a lot for the civilian!

Figure it out for yourself. It takes 5,250,000 gallons of gasoline to fuel 5,000 bombers and fighters for a mission over Germany. It takes enough oil for one fueling of a battleship to heat an average house for 350 years. It takes 18,000 gallons of gasoline to keep one armoured division on the move for one hour.

From petroleum and petroleum gases we obtain the gasoline and fuels needed to power planes and ships and tanks as well as the raw material for acetone, ammonia and toluol for explosives, organic chemicals for anaesthetics, naphthas for camouflage paints and plastics and resins for war weapons production.

This is why civilian gasoline is short. This is why it’s up to every motorist, to every owner of an oil-heated home, to exercise the strictest economy in gasoline or fuel oil usage. Every gallon we can do without here at home is one gallon more for the fighting men. And they need every gallon they can get.

Two full years of gasoline rationing and fuel oil control in Canada have saved 393,000,000 gallons of gasoline and 175 million gallons of fuel oil—a total saving of 568,000,000 gallons of petroleum products. Yet, despite this saving, gasoline stocks on hand in Canada, as of March 31st, this year, were 55,000,000 gallons less than at the commencement of rationing, April 1, 1942.

Oil has a mighty war job to do—yet supplies are short and are constantly dwindling. Oil powers the attack on every front. Oil can mean the difference between success or failure, between light casualty lists and heavy. Oil is vital ammunition—not to be wasted, not to be needlessly, frivolously spent.

OIL IS AMMUNITION

Use It Wisely