A 20th Century Queen

The pageantry of the Coronation, which is coloring all of 1953, has as its central figure a young woman who, because of her poise and charm and character, has made a warm and human event of all the ancient and sacred ceremonies.

Elizabeth II has a special place in the affections of Canadians. We watched as she grew from childhood and as she shared the experiences of wartime London. We liked her choice of a husband and we listened to that other great service in Westminster Abbey when she was married. As a mother and a princess she toured our country. She has had our deep sympathy when death came to the fine man who was her father and then to the greatly respected Queen Mary.

The person of the Sovereign and the institution of the Crown, as our Governor-General said recently, together satisfy “the universal craving for a personal symbol of justice and mercy without servility . . . a symbol combining law and order with humanity.”

The traditional significance of the monarchy receives much emphasis—and rightly. The constitutional monarchy contributes to the stability of the nation. This is a particularly vital and practical function in a rapidly developing country such as Canada. Our country is a good place in which to live and work, a good place in which to do business, and this is so because we have stable government.

But stability without change would make progress impossible. It is just as important that the monarchy, while remaining as the symbol of the great traditions of the past, should also represent the advances of the present and those that are to come. In Canada, as in Britain, constitutional government under the Crown has been effective not only in maintaining but also in developing freedom and liberal institutions.

This is the 20th century conception of the function of the monarchy. It is the particular contribution of the present Royal Family, developing from Victoria onward. Like the unwritten parliamentary constitutions, the monarchy has demonstrated the ability to change with the times in those things which are important to good government.

This has been proved in Britain during the crises of recent decades. Major social and economic changes have taken place which, under other political systems, might have led to civil war or revolution. But in Britain the adjustments have been made without disturbing the essential framework of government. And the constitutional monarchy, representing no particular class or section or political interest, is the rock on which the framework is based.

In short, the Crown stands for the permanence of the best things in nationhood of yesterday, today and tomorrow. It links Canada, not only with the great Old Land, but also with the sister nations in the Commonwealth.

All of this is inherent when we pledge allegiance to our new Queen. Long may she reign!

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Picture Credits:
The Crown in Canada

By Arthur Lower
Professor of History, Queen's University

The scene we will all remember: they were crowning a new Queen in old Westminster Abbey. Cheering everywhere, the salute of a cannon, stately processions. Within the great abbey church, the long solemn ritual of the Coronation service. The flashing of coronets, the silk, the ermine, the clergy in their impressive habits, the strange figures standing about, who come to life only during a Coronation—Rouge Dragons, Rose Croix, Unicorn Pursuivant, and many others—the solemn music, the ancient ceremony of homage. The lonely little figure there in the centre of it all vested with symbolic garments, the giving on of symbolic swords, the anointing with the symbolic oil, and great central act of all, the descent upon that human head of the Crown.

As the Archbishop placed the Crown upon the head of the Queen, shouts of acclamation rang out, trumpets sounded, guns caught up the salute around the world. A Queen was crowned!

In ancient days, the ceremony gave to the newly-crowned monarch a mystical character. "The king is partly a priest!" said one writer. Something happened
with the descent of the Crown, the king become more than mere man. It was much the same conception as underlay the miracle of the Mass, with its changing of the bread and wine into the actual body and blood of Christ.

Today, the mystical aspect of the Coronation is no more present than is the changing of the elements in the Protestant Communion. Both Coronation and Communion are symbolic. The monarch is the chief magistrate of the state.

A chief magistrate invested, however, with the prestige that centuries of office and dignity confer. The Coronation serves to unite the two quite distinct aspects of the monarchy. On the one hand, there is the gracious young woman—daughter, wife and mother like other young women. On the other, there is the symbolic figure—The Queen. “The king never dies.” “The king can do no wrong,” the lawyers say. Everyone knows that kings can do wrong and can die. “The king is dead, long live the king” is the ancient, familiar shout. What lies behind these catchwords?

THE IMMORTAL CROWN

Simply that something goes on permanently, regardless of the mortal man or woman who at the moment is the holder of the monarch’s office. Something passes from the dying monarch to his heir with the speed of light, so that there is never a moment’s interval. What is that something? We call it for convenience THE CROWN. The Crown is it which is immortal and which, because it stands for justice, can do no wrong.

Yet nowhere in English law can there be found the familiar abstraction to which, every day in the week almost, we refer as “The Crown”—“Crown lands”—“County Crown Attorney”— “Ministers of the Crown” and many other phrases indicate cases in point. But the lawyer cannot find that “Crown.” All he can find is a person—the king, or queen. Laws cases do not stand described as “Corona versus John Smith”—“The Crown versus John Smith”— but as “Rex (or Regina) versus John Smith.” “The King (or queen) versus John Smith.” “The Crown” is just a convenient term.

This confusion is perplexing, to say the least. Can the queen be human and also an institution? Such is exactly the state of affairs. No distinction has ever been made between the person and the institution. Once it was tried: back in the reign of Edward II, in the year 1307, a rebel nobleman announced—

The doctrine that “homage and allegiance do not lie to the king but to his crown and until the estate of the crown has desecrated (that is, at the Coronation) no allegiance is owed”. The great Lord Bacon of Queen Elizabeth’s day, called this a “damnable and damned doctrine”. It gained no foothold in English law.

What all this means is that the English world has never had a doctrine of “the state.” The abstract“Crown” is made to do duty for the abstraction “the state” and in this metaphysical way king and crown, person and abstraction, are made to coincide. This piece of hyperbole may appear unnecessary but it is simply the product of history. And, of course, it is of immense practical importance in our own institutional life, as I shall attempt to show.

Today we say “The king reigns but does not govern.” We ascribe immense dignity to the royal office; we endow the sovereign with riches and an unlimited prestige; we give a warm place to her in our affections. And yet we all know that the personal king or queen has very limited powers, that he or she depends on the government of the day and could not last for a moment if he attempted to make real the powers which are ascribed to him and wielded by others. As the case of the Duke of Windsor, once Edward VIII, indicates, the royal person is not even free to contract a marriage of his own, and if he is persistent, he simply has to give way to someone else. The king reigns but does not govern.

There was a time when kings did, without a shadow of a doubt, govern. If they did not, they did not last long. It took centuries to impose effective checks on the power of the king. This was done by slow degree and all the famous landmarks of English history are milestones along the road to the limitation of the royal power—Magna Carta, the Petition of Right, the Bill of Rights and many more. Eventually, after the struggle between King and Parliament in which Charles I lost his head, and after his son, James II, had been driven out, Parliament triumphed. The Glorious Revolution” of 1688, which installed William of Orange, put an end to kings who really governed just as it put an end to the last vestiges of the mystical king. When William and his wife, Mary, accepted the throne, they did so on an offer from the people of England and they accepted it hedged about with conditions. They thus became monarchs by the choice of the people, monarchs “made in Parliament.” English sovereigns have been made there ever since.

THE SPLENDID PHANTOM

Nevertheless not one iota of the ancient verbiage is changed. If you park in the wrong place, you get a summons personally from Elizabeth II. Elizabeth II uses the first person singular, when speaking of her people, soldiers, ambassadors, colonies, dominions. “My people,” “my army,” “my navy,” “my Dominion of Canada,” “my judges” and so on. The hogs run in her name: “Elizabeth II, by the Grace of God, Queen of, etc. . . . enact as follows.”

If you know what words to put in, in place of the dots, you of course won’t be much impressed by Elizabeth’s personal powers of law-making. The omitted words consist in a well-worn formula “by and with the consent of Lords (Senators, etc.) and Commons and under the authority of the same.”

But the old legal formula still makes the law appear to be the personal royal enactment.

The vast discrepancy between the apparent and the real power of the sovereign led the great English legal historian, Frederick William Maitland, to speak of the present day English monarchy as the “splendid phantom.” Let the phantom come to life and probably it would crumble (if phantoms can crumble). At any rate, again we have the contrast between the magnificence of the personal kings or queens, the awe and reverence with which they are regarded, and the limitation of their royal powers, nearly all of which are wielded for them by Ministers, “responsible” as we say, to Parliament.

This being the situation, we need not be surprised when we turn to the British North America Act (1867), upon which our own Canada rests, and find these words:

“The Executive Government and authority of and over Canada is hereby declared to continue and be vested in the Queen.” (Section 9)

This sounds conclusive enough; Canada was to be governed by the Queen.

Try this on your American friends: get them to read some of the clauses of the British North America Act and then ask them if this is a self-governing country. You will be surprised at the number of them who decide we are still under the heel of the British monarch, still, in all probability, being made to pay tribute to her and dragged off to fight in her wars. Every Canadian knows this is nonsense, but after all, there are the words in the book! The explanation lies in the distinction between line and practice. But how is the stranger to know what the practice is?

If you can get your American friends to plough further into the Act, they will find provisions for setting up a Parliament for Canada as a whole and also legislatures for the separate provinces. They will find long lists of powers assigned to either one or other of them. They will find that there is a council to advise the Queen, “styled The Queen’s Privy Council for Canada.” But nowhere will they find any mention of a prime minister, a cabinet or of political parties. And the very Parliament itself, how is it composed? “There shall be one Parliament for Canada consisting of the House of Commons and the House of Commons.” So the Queen is an integral part of Parliament, which cannot be a legal body unless she calls it together.
And she can, from long usage, dismiss it whenever she pleases. So that Senate and Commons would not appear to the stranger to amount to much, in comparison with the Queen.

The Queen, moreover, is Commander-inchief of the Land and Naval Militia, and of all Naval and Military Forces, of and in Canada" (Section 15). Where does Canadian self-government come in there? From long experience, I know how difficult it is to explain the difference between the theory and practice of our government. In the United States, the situation is different and easier. The U.S. has a written constitution which means what it says—President elected for four years by a precise method, Senators elected for six years, President given specific powers and powers of Congress also defined. All this is as plain as sunlight. The reason is simple: the American Revolution destroyed the old colonial governments and when the new nation, the United States, was formed, it had to give itself a formal government. This it did by drafting a constitution and then by each state accepting the constitution as the supreme law of the land. The U.S. thus started from scratch.

Now as every school boy knows, the provinces which later came together into the Dominion of Canada were not swept into the American Revolution, and so the old order of things remained intact in them. That meant that government in the King's name went on in, say, Nova Scotia, just as before the Revolution, it had gone on in, say, Virginia.

In due course the remaining colonies all obtained representative assemblies, but the powers of these assemblies as against the King's representative were not defined. Dissension began and eventually led to the rebellions of 1837. These rebellions convinced British authorities that the powers of the Crown could no longer be left in the hands of a few appointed officials. The result was that in a quite informal way, in about 10 years after the rebellions, the governors were instructed to choose as their advisers those men who could command a majority in the elected assembly. Thus quietly was the great principle of "Responsible Government" introduced into the Canadian system.

"Responsible Government" was revolutionary. In practical political terms it meant that the leaders of the Assembly became the advisers, or Ministers, of the Crown as represented by the Governor. This meant that the Governor was to find it practically impossible henceforth to act independently, for if he did, he would find a non-cooperative assembly refusing to vote money for the public services and the wheels of Government would come to a stop. Consequently power in every colony passed from the hands of the Queen's representative into those of her advisers supported by a majority of the elected representatives; into the hands of the Ministers of the Crown, or collectively, "the Cabinet".

**LAW VS. CUSTOM**

But note that not a single syllable in any law indicates this change. As I have tried to show by quoting from the text of the Constitution Act, in strict letter of the law the old authority of the Crown is undiminished. In other words, with the introduction of Responsible Government into the British North American Colonies in the years 1846-48, the law of the constitution had become one thing, the custom, or practice, quite another.

When the Dominion of Canada was formed in 1867, this situation was not affected: the law of the constitution continued unchanged, everything was in the name of the Queen, as before, but the practice of the constitution went on as it had begun in 1846-48, with actual power in the hands of ministers and their party supporters in the Commons. This was the position in each of the provinces, too.

Now we begin to see what we have on our hands when we talk of "The Crown in Canada". "The Crown" means the historic monarchy of England. "The Crown" also is the most complex political term that exists. It means a person, it means an institution, it means the state, it means the immutable usages that have accumulated over the centuries and all the independent powers which can be exercised by government. All this is "The Crown".

We Canadians inherit "the Crown, the whole Crown and nothing but the Crown", so to speak, because we have never broken our ties with Great Britain. It was Crown in Parliament which enacted the original act under which we were united—the British North America Act—so that legally, all our institutions rest upon this conception of "The Crown in Parliament".

**QUEEN OF SEVEN COUNTRIES**

It was the historic crown which came into Canada and which still exists here. Naturally, over the years, we have taken our own government more and more into our own hands, so that today there is never any interference from Great Britain, and we consider Canada an independent country. Yet our laws still run in the name of the reigning sovereign, our parliament is "her parliament", our army "her army" and so on. It is now "Of the United Kingdom, Canada and her other realms and territories, Queen". (In Australia and the other self-governing countries the name of each is substituted for "Canada"). Canada it may be said has its own queen, Elizabeth II, Queen of Canada.

That Elizabeth II above all other names of the Queen of Canada puts an additional strain upon understanding, for the same lady is Queen of Great Britain, Australia, Ceylon, etc. She is Queen of some seven separate countries and yet at the same time one indivisible person. The only way that the subject can be made clear, it seems to me, is by a figure of speech. The original English monarchy might be compared to a main electrical cable. Branches go to each of the self-governing countries. In all of them, electric globes light up from the electric current circulating. Are these electric lights entirely separate objects or are they parts of the entire electrical circuit, or are they both at once?

In the United States, the question is relatively simple. A territory gets 60,000, or more people, asks for admission as the Union as a state, and if so admitted, gives itself a constitution and takes its place alongside the other states. There you have separate power houses lighting up each one of these forty-eight houses called states. It is true there is a general powerhouse, too—the Federal government—but apart from minor interconnections, it is separate and distinct from the local power houses. Not so under the historic Crown of Great Britain. Although each country is self-governing, and within some of them, there are separate provinces, also largely self-governing, it is the same original electric current which circulates through all of them. In other words, there has never been a severance made from the original crown. Thus, although we have a Queen of Canada, that Queen is part and parcel of the historic monarchy of Great Britain.

The immemorial powers of the historic monarch, we say, are no longer wielded by him, but by his ministers responsible to a body of elected representatives. Even so, the amount of power which the ministry of the day can wield in the name of the Crown without consulting parliament, is very great. It can appoint officers, make treaties (which might involve giving away some of the national territory), float loans, even declare war or make peace, without coming near parliament. Of course eventually the ministry would have to come to parliament because it would run out of cash and the one indispensable power that parliament has always been jealous of retaining is the power to grant taxation. Still, the powers of the Crown exercised through the ministry are great. These historic powers are known as the Royal Prerogative. When today the Minister of Justice parrots a criminal, excusing him from the consequences of his wrong, he is using the power of suspending the operation of the law against a particular person.

The Royal Prerogative powers—those official acts the Queen can perform in her own right, without asking anyone's advice—are few and not
even more important, George VI on his own responsibility, it is believed, made his brother Duke of Windsor. In 1922, George V asked Mr. Baldwin, not Lord Curzon, to form a ministry, that is, he made a choice between two men, each of whom seemed equally entitled to lead the government of the day.

In Canada, Lord Byng in 1926 exercised the Royal Prerogative in a celebrated instance which still hurts us about our debating bodies: he refused to give Mr. King a dissolution and then called on Mr. Meighen to form a ministry. He did this on his own responsibility, as representative of the King. It was one of the few modern instances of the monarch, or his representative, using his personal prerogative. Among the major distinctions between Canadian and American government is this theory on the nature of the Crown. The powers of the American government rest upon a written constitution ratified by the people of the United States. Theoretically, they could scrap this constitution and write another one. The separate states still have their own system of courts, their own criminal law, their own judges, all quite distinct from parallel federal institutions.

Such a situation could not obtain in Canada. The Crown is the Crown, whether it operates in Ottawa or Prince Edward Island. The attorney-general of every province is the law enforcement officer of the Crown. He can make no distinction between Dominion and Provincial law: they are all the Queen's laws. The judges are the Queen's judges, enforcing her justice. This is a practical illustration of the "electric current" running from "the Crown". While there are disadvantages also, many practical advantages flow from our way of regarding the Crown. All government is the Queen's government: all ministers are her advisors. Ministers once sworn of the Queen's Privy Council remain Privy Counsellors for life, whether their party goes out of office or not. This has the effect of imposing upon them a weight of responsibility: although no longer in office, they can never be merely private persons again, for they are the Queen's Privy Counsellors. Then there is the important gain in the unity of the law. All judges are the Queen's judges. All infractions of the law break the Queen's peace. In the United States it is just about as difficult a matter to extradite an accused criminal from one state to another as from a foreign country. But in Canada an accused man can readily be moved from one province to another; the law being the Queen's law, there can be little point in making distinctions as to where it was supposed to be broken.

THE ROYAL LINK

Perhaps most important of all is the sense of unity imposed on vast masses of mankind by their feeling for the ancient monarchy. This warm emotion affects some much more deeply than others, of course, but it is highly prized by them—everyone in this country. The monarchy is an important link between the past and the present, and it provides a sense of continuity and tradition. It is a symbol of stability and it is a source of pride and identity. It is a unifying force, bringing people together and fostering a sense of belonging.

Another important legal conception flowing from the notion of "The Crown" is that of "British Subject". Canadians, although at long last Canadian citizens, are still also British subjects. They are British subjects wherever the Queen reigns, just as are Pakistanis, Kenyans, Rhodesians, Jamaicans and the inhabitants of Pitcairn Island, whether in their own country, or if they should come to Canada. The status British subject might not prevail, shall we say, Chinese British subjects from Malaysia free entry into Canada, for each country has placed some restrictions on its own citizenship, the generality of the conception remains.

We Canadians, French and English, have never known anything else but monarchical government. The conceptions surrounding that type of government go so deep into all aspects of our lives that to remove them would be revolutionary indeed. The conception of "The Crown" goes far deeper into our institutional life, it seems to me, than does the British connection. We could terminate the British connection but to destroy the concept "The Crown" would be like exploding an atomic bomb—it would rend the fabric of our society. Historically and actually, insofar as our government and public institutions go, we live, move and have our being within that entanglement of living person and abstract institution which we call "THE CROWN".
colonies yesterday

On June 28, 1858, the land that is now Canada was young and undeveloped as the teenage girl, Victoria, who in London that day was crowned Queen of Great Britain and her colonies overseas.

In 1858 this was a land to try the mettle of the hardest pioneer. It promised much but demanded a Chur- chillian tribute of "blood, toil, tears and sweat" from all who sought to wrest their livelihood from it. Less than one-fifth of it was charted. Great areas were as unknown and mysterious as the outer reaches of space are to us today. A few more than one and one-quarter million people-about one-tenth of today's population—were scattered over the Maritime colonies and Upper and Lower Canada. A group of hardy souls had established the Red River settlement, isolated in the west.

Revolt had been suppressed but a few months earlier, both in Upper and Lower Canada. William Lyon Mackenzie was safe over the border after his abortive uprising against non-responsible colonial rule in Upper Canada. In Lower Canada, Papinou had fled in the wake of an unsuccessful revolt. Montreal and Toronto were even then the largest centres in the Canadas. Toronto boasted a population of 12,000 and Montreal one in excess of 50,000. Their streets were ill-paved and ill-lighted and plumbing was rudimentary at the best.

More typical were the little hamlets. Some of them, in Lower Canada, were already long-established and life and property were guided by seigniorial customs. Others were like Goderich on the eastern shore of Lake Huron, which 700 people called home. Clustered around two tanneries, three breweries and one distillery were its 143 frame houses and 73 log cabins. They were divided by muddy cart tracks and paths worn smooth by the constant trend of people who moved more by Shank's mare than by wheels.

Travel, even in the blazing mosquito-ridden summer, was difficult and a day's journey was an adventure. The King's Highways consisted mainly of the roads which followed the main rivers, and a few cross-country arteries maintained for and by the military. Others, particularly those in the semi-bush areas linking the small villages, were built and protected at the whim of the seigneurs in Lower Canada and of the local property owners in the other colonies.

If you had money—which most of the colonists hadn't—you travelled by coach, horseback, bateau or Durham boats or by the few steamers on the St. Lawrence and lower lakes. The alternative, and the only method open to most of the settlers, was to foot one's way overland. There was one small railway, built the year before, to bridge the 15 miles from Lachine to the Richelieu above Chambly Rapids. It was merely a link between water routes. A few canals had been sliced through the Canadian soil to link vital waterways. All were shallow, the largest of them, the Welland, only eight feet deep.

For many, life was a hand-to-mouth existence with hunger a commonplace. All communities concentrated on raising the staples of life.

On the coasts fishing and a hard-fought crop from the rocky soil provided most of the Maritimers with their livelihoods. Halifax would be incorporated in the fourth year of young Victoria's reign. New Brunswick could best be likened to an enormous lumber camp. In winter the farmers left the land to strip the forests. In the spring they returned with their pockets comparatively full of money. This they blew in the towns, and then returned to their farms to start farming and the cycle began again.

Uncertain as the crops were in all of the colonies, wheat and flour went abroad to England and below the border to the New England states. The fur trade was on the ebb, and timber—ever to be one of Canada's greatest assets—was the main export. In fact, it accounted for two-thirds of the outgoing trade to Britain and New England. Capital, technical skill and luxury goods were at a premium. It was to be eight years before woolen mills began production.

Communications were almost negligible. The telegraph did not make its appearance until nearly a decade after Victoria's coronation. Mail deliveries were expensive and unreliable. There were no free schools and wouldn't be for at least another three years. Only those with money could afford to send their children to grammar schools in the principal towns of most districts. Doctors were scarce, their functions being served mainly by barbers, midwives and enthusiastic friends.

Rugged though the land and life were, settlers continued to pour in. The colonies stood on the threshold of a great development. Ahead lay Confederation and the destiny of a world power.

today a nation

All the world has changed to some extent since that other June coronation of a girl Queen, 115 years ago, but in Canada there has been a complete transformation.

The title of the new Queen expresses these changes. Elizabeth II becomes not only Queen of Great Britain, but Queen of Canada as well. The scattered handful of colonies and territories at the start ofVictoria's reign has developed into a nation, spanning a continent and including the proud and historic island of Newfoundland. It is still young, but strong, free, self-governing, and a leading member of the Commonwealth, speaking with a clear voice in the council chambers of the world.

And now, as a new Elizabethan era begins, opportunity beckons Canadians to an even more exciting future. The Canada of today should be merely the framework for further growth. Canada's nationhood is soundly based on democratic government and just systems of law. It has...
the inheritance of the traditions and cultures of two of the world's oldest and greatest nations. And it has also been aided by the contributions of the world's throngs that have poured in from other lands to become Canadians.

Blessed with tremendous natural resources spread over the world's fourth largest country, Canada's material advancement has been phenomenal. The grim struggle for existence in the pioneering days has given place to a standard of living second only to that in the United States. Long a granary to help feed other nations, Canada also has become the world's sixth-ranking industrial producer, its fourth largest trader.

And yet our population of 14 millions is a mere handful by world standards. Canada has been built by comparatively small numbers of people who have succeeded in overcoming many obstacles including that of great distances.

Modern transportation and communications were introduced rapidly as they became available. It has been said the "Boom began in '93"—1893—that is with the railway expansion 100 years ago. A decade later the idea of coast-to-coast railways shaped Confederation. Trains, automobiles, trucks and aeroplanes; telegraph, telephone and radio systems—they all helped to open up the country and bind it together into the Canada of today.

Great areas that once were empty now are settled with productive farms and ranches, lumber cumps and mines, oil and fishing and other specialty points, all linked in a continuous community across the country. Pioneer place names remain, with countless others added. Montreal and Toronto each has become a million-plus metropolis of commerce and industry, but east and west and around them stand other big cities and towns, busting their boundaries with steady growth.

In the newer districts, churches are numerous and active, as they always have been in the older cities, towns and hamlets. And Canada is a land where there are educational opportunities for all, with well-equipped schools, colleges and universities, great libraries, medical and research centres. There are Canadian movements in art, drama, music, letters and the ballet. The Bytown of Victoria's day has become Ottawa which has taken its place among national capitals. From Ottawa, Canada exerts a sober influence for what she believes to be the right in world affairs.

Much of our position comes from our country's productivity. The rich earth is still our most important industry.

Farms, forests and the waters pour forth their abundance each year: wheat enough to feed 100 million people, seven times our own population; other grains, fruits, tobacco, fodder, vegetables, livestock, dairy produce, poultry, honey, pulpwood, fish, timber—the list is endless.

This is no longer primarily an agricultural nation. There are now two persons in industry for every one on the farm. New factories rise every month. And from below the ground in every province Canadians bring forth the minerals that make our mechanical civilization work. Sudbury supplies 80 percent of the world's nickel; British Columbia has the world's largest single tungsten and lead mines. Silver, gold, coal, platinum, palladium, titanium—and cobalt for the western world's jet planes, uranium for its atom power—they all come from the mineral storehouse that is Canada.

Uranium mined from around Great Bear Lake was the heart of the first atom bomb. It is uranium that transforms cobalt, when sealed inside the great nuclear pile at Chalk River, into the greatest cancer-fighting weapon science has found, the "cobalt bomb".

Canadians are doing things in a big way and new projects are taking form from one end of the country to the other. Annually we have been investing 20 percent of our national income in the country's development.

At Kitimat, B.C., the largest aluminum producing plant in the world is being built in what was almost a wilderness two years ago. Nearby, in a tremendous hydro development, a man-made waterfall will have a drop of 2,600 feet—15 times that of Niagara—to produce two million horsepower of electricity. Other hydro expansions dot the provinces, helping maintain Canada's position as the world's second nation in water power development.

Canadian petroleum, another source of power for the nation, is being put to work in steadily increasing quantities. Energy from the oil produced in the western fields each day is about 18 times that generated at Niagara. Canada formerly had to import most of her oil needs; now she has a large supply from within the country. The billion-dollar oil development of the past few years has helped to bring prosperity. One offspring is the birth of a petrochemical industry in the west. And pipeline to carry crude from Alberta are being pushed west across the Rockies to the coast, and extended east to provide a through artery to Ontario. The search for still more oil reserves is proceeding all out on the prairies and in the north.

Iron ore has its special place in present growth. Ontario's Steep Rock mine, where a lake was drained to reach a substantial deposit, already is an accomplished engineering feat. The Ungava development in the wilderness of the upper reaches of Quebec and Labrador involves even greater engineering tasks. Among them is the construction over rocky country of a 300-mile railway to open up the iron ore deposits estimated at 500 million tons.

Many of us will probably live to see the opening of the St. Lawrence Seaway, a dream dear to Canadians for more than 40 years. Perhaps we'll build it ourselves, perhaps with the help of our neighbor, but in any event it will link the heart of industrial Canada with the Atlantic shipping routes of the world and provide still more millions of horsepower of electricity.

With these and many other enterprises, Canada is on the march. There still are spaces to conquer and work for the explorers, the pioneers, the thinkers, the bankers and the builders. Canadians are filled with dreams, ideas, hopes and principles that will be translated into action. Even more than it is now, they will make this a country fit for a Queen.
J.R. White Imperial's New President

Twenty years ago Imperial Oil, then chiefly concerned with manufacturing and marketing oil products, hired John Ripley White as a junior draftsman. Mr. White was a young engineer, just 25 years old and only two years out of college.

In April this year, J. R. White became president of Imperial, elected top executive by the board of directors following the company's annual meeting. At 42 years of age, Mr. White has acquired a broad knowledge of all phases of the industry's operations. He has held key positions of responsibility in Imperial through a period in which there has been a rapid expansion of its activities, including the growth of large-scale crude production.

The new president, who is over six feet tall and weighs about 200 pounds, has become a familiar figure among Company employees and management throughout Canada. Each year he makes three or four cross-country trips to visit Imperial operations. He also makes perhaps half a dozen public addresses each year as an authority on oil.

Mr. White was born in London, Ont., the city which, in 1880, was also the birthplace of Imperial Oil. He received most of his schooling there—public, high, and the start of his university education at the University of Western Ontario.

He then went to the University of Toronto where he received the degree of bachelor of applied science in mechanical engineering in 1931. At college he played middle wing on first string rugby teams, winning an enviable reputation as an intercollegiate footballer. He has continued his interest in sports and now is often seen on the golf course where he shoots in the 90's—and around street and trap ranges.

After graduation, Mr. White returned to London. His father, J. Franklin White, then represented the city as Conservative member at Ottawa. Soon after his return, the young engineer began work in a steel plant. In 1932 he married Anne MacGregor, also of London. It appeared that he was going to settle in his home town but his plane was changed abruptly when the steel plant closed down. A few weeks later, in April, 1933, he joined Imperial at Sarnia.

Mr. White spent the next four years in practical refinery engineering. For the first year he worked at the drafting board and then moved into Sarnia's engineering and development group where he did design and test work on cracking coils and other units.

Canada's oil industry was a country in which to gain a knowledge of all the many and varied operations in oil. While the manufacturing and marketing operations were on a considerable scale, there was limited production of crude and just a few miles of oil pipe lines. Most of our crude had to be imported from the United States or Venezuela.

It was to these countries that Mr. White's career took him, beginning in 1937: first to the U.S. for special studies with a group which did long-range planning of capital investment, financial forecasts and special consulting work relative to the value and use of crude oil; then to the Venezuelan oil fields to spend six years in most phases of the already large and rapidly expanding oil industry there.

When, in 1944, the time came to return to Imperial, Mr. White had acquired the rank of vice-president (in Standard Oil of Venezuela, later a part of Creole Petroleum Corp.), a mastery of Spanish and a liking for the country and its people which has taken him back to Latin America on every possible occasion.

He returned to Canada just a few years before the expansion and development that completely changed the oil economy of the country, creating many new opportunities. Today the industry is capable of producing more than 100 million barrels of crude oil annually, will soon have pipe line systems extending from the Atlantic to the Pacific, and has a refinery capacity approaching half a million barrels a day.

Mr. White's experience was put to good use. Within 12 months of his return to Imperial as economic coordinator he was elected a director of the Company and a few months later a vice-president. In September, 1949, he was elected executive vice-president.

Being on the Imperial board is a full-time job. As one of Imperial's working directors, Mr. White was one of the group that demonstrated its faith in the oil possibilities in western Canada which eventually resulted in the Leduc discovery in 1947, touching off Canada's present oil boom. He shared in making plans for the developments that followed: the movement of a refinery down the Alaska Highway to Edmonton; the construction of the Interprovincial pipe line and of Winnipeg refinery; the building of Canada's first fluid cut cracker, and of the first products line.

Two years ago his administrative ability and leadership qualities were recognized when he was awarded the Toronto Engineering Alumni Association Medal. The award was based on his ability in co-ordination and teamwork rather than for an isolated achievement in engineering. Highest honor of the Association, the Medal is granted only at three-year intervals.

Of him the Financial Post said he "combines a flair for getting along well with people with a tremendous capacity for hard work...he has had experience with virtually every phase of the Company's operations."

These are the qualities that J. R. White brings to his new responsibilities at a time when Imperial is still engaged in great expansion and development...
G. L. Stewart

Chairman of the Board

The new position as chairman of Imperial's board of directors will allow George L. Stewart to relinquish some of the onerous duties he has performed over the past four years as president. For nine of his 37 years with Imperial, Mr. Stewart has served on the company board.

He is assuming the position of board chairman for the second time in four years. He was first elected chairman of the board in 1947, and two years later was elected president.

Probably one of the most modest men in Canada's industrial life, Mr. Stewart, once a teacher, may be said to have broken the "ivory tower" for the refinery tower. The emphasis in his career with Imperial has been in refinery engineering and operation. During his term as president the company's refineries, along with the company's exploration, oil producing, transportation and marketing operations, have undergone unprecedented growth.

A Winnipegger by birth, Mr. Stewart received his early education there. He moved east for his university career and in 1914 graduated from McGill University as a bachelor of science in mechanical engineering. After graduation he stayed at McGill for nearly two years as a lecturer.

At this point an interest in practical engineering influenced him to leave the halls of learning and join Imperial which was then embarking on a vast program of refinery expansion.

Until about that time Imperial's manufacturing operations had been pretty well confined to Sarnia refinery. To serve the demands of rapidly expanding automotive and other markets, the company had decided to increase its refining facilities from coast to coast.

Regina and Montreal refineries were in the building stage; Imperial refinery at Halifax was being planned. Tony refinery at Vancouver was recently completed. To handle this refinery program a small engineering group was formed at Sarnia. It was probably the earliest oil industry engineering group in Canada. In 1916 Mr. Stewart joined this select team.

Within two years he was mechanical superintendent at the new Halifax refinery, and in 1919 he was transferred to manufacturing head office in Toronto. After three years there he went back to his native west as assistant superintendent of Regina refinery. Later he moved to Sarnia in the same capacity and in 1931 became general superintendent of Sarnia, the largest refinery in Canada.

That was his last refinery appointment for in 1934 he was brought back to Toronto as general manager of the manufacturing department. In 1941 he was elected vice-president and director in charge of manufacturing and three years later chairman of the board. He held this position until 1949 when he was elected president.

Last year Business Week, a major American business publication, took a look at the Canadian oil industry and singled out George L. Stewart as its leading figure.

It said this: 'Stewart ... still likes education work, keeps alive a company tradition of frequent half day sessions with college seniors and their professors. He's mild-mannered and conservative ... modest, not shy: progressive and aggressive in a quiet way. One imperial official put it this way: 'Goes you'd call a solid citizen. The kind of fellow you'd want to talk to if you had a deep personal problem.'

The Canadian magazine, Manufacturing and Industrial Engineering, chose him as head-off man in a series of sketches of leaders in Canadian industry.

"He is known," said the magazine, "to be strongly in favor of thinking things out very carefully and avoiding snap decisions. He firmly believes that snap decisions are only excusable in case of absolute emergency.

"Another thing that has enabled him to accomplish a great deal in management and worker relations, in a readiness at all times to see the other fellow's viewpoint. His decisions have always been made with consideration for others. Every problem which he is called on to handle is carefully scrutinized and when a decision is finally reached, it is planned so as to be in the best interests of everyone involved."

OTHER CHANGES

In addition to electing Mr. White and Mr. Stewart to new positions, the board at its meeting following the annual meeting of shareholders added two new vice-presidents, J. K. Jamieson and Trevor F. Moore, to Imperial's management team. They joined F. G. Hall and W. O. Tweta who previously had been elected vice-presidents.

Earl S. Neal, who was appointed a director earlier, in the year to fill the vacancy created by the death of A. Gordon DeMond, was elected to the board by shareholders along with G. E. Carson and J. W. Hamilton.
Executive Changes

J. K. Jamieson Becomes a Vice-President

J. K. Jamieson, newly-elected vice-president of Imperial Oil takes over his additional duties with over 30 years' experience in the engineering, manufacturing and economic phases of the oil industry. A native of Medicine Hat, Alta., he attended the University of Alberta and holds a science degree from the Massachusetts Institute of Technology.

During World War II, Mr. Jamieson served with the Canadian government in the oil controller's office. After the war he joined Imperial as associate manager of the co-ordination and economics department and in 1949 was transferred to Sunzima to head the engineering and development division. A year later he returned to Toronto as assistant general manager of the manufacturing department. Early in 1951 Mr. Jamieson was on loan to the Department of Defence Production to assist in the formation of the petroleum division of that Department. In April, 1952, he was elected a director of the Company.

Trevor Moore Elected a Vice-President

Trevor F. Moore also has taken over vice-presidential duties for Imperial. He has wide experience in the field of corporate finance.

Born in England, Mr. Moore came to Canada in 1913. He attended University of Toronto Schools and the University of Toronto. Upon graduation in 1928 he joined the firm of McLeod, Young, Weir & Co., where he gained experience in statistical, sales and sales promotion work. He later became sales manager. In 1946 he was named a director and vice-president. He joined Imperial in 1950 and was elected a director.

Mr. Moore has taken part in many community activities. He is a past president of the Community Chest of Greater Toronto, and now is a vice-president of the Canadian Club, a director of the Toronto Symphony Orchestra and the Boys' Clubs of Canada. He is also on the advisory board of the Boy Scouts, metropolitan area.

E. S. Neal Elected a Director

E. S. Neal, general manager of Imperial Oil's producing department, has been elected a director of the Company. Mr. Neal has been associated with the oil business since 1926 when he graduated in petroleum engineering from the College of Mining of the University of California. He joined Lago Petroleum Corp. in Venezuela as a geologist and rose to the position of chief geologist. In 1938 he transferred to Standard Oil Co. (N.Y.) in New York. At first he was in charge of world-wide reserve studies and later headed the producing economics section. In 1952 he took over his present duties with Imperial Oil as head of the producing department.

Mr. Neal is a member of the American Petroleum Institute, the American Institute of Mining and Metallurgical Engineers, and the American Association of Petroleum Geologists.

Imperial's expansion and modernization of refineries, a $125 million post-war program, is described in the Company's annual report along with other increased activities.

New Peaks of Progress

An important phase of Canada's oil boom has received somewhat less than the world-wide attention given in recent years to the Western discoveries and the growth of the great pipe line systems.

At the same time that Imperial Oil has been playing a leading part in finding, producing and transporting oil, the Company has been engaged in another notable and extensive undertaking - the modernization and expansion of refineries in many parts of Canada.

Imperial's annual report for 1952 shows that $24.5 million were spent last year on refinery expansion and modernization. This represents only part of the post-war refinery program in which, when all projects are complete, well over $125 millions will have been invested.

Under this program, Imperial is developing some of the most modern and efficient oil processing plants in the world. Because of the improved equipment, the Company is able to manufacture and market the finest oil products ever produced in Canada.

The new towers that already stand at Imperial's refineries at Montreal East, at Sarnia, and at Edmonton and Winnipeg, together with the projects under...
way at these centres and at Regina, Vancouver and elsewhere are adding to Canada's industrial potential. For this reason, the expansion program deserves to share the spotlight with the dramatic discoveries in the west.

Building a modern refinery is a complex and costly undertaking. It involves equipment that ranks high among man's technical achievements—the fluid catalytic cracking units, the atmospheric and vacuum units and others which turn crude into crude into a myriad of useful products. It also calls for great quantities of materials—brick and cement, pipe, fittings, and a mass of other things—for the buildings, tanks and the more prosaic adjuncts that are just as necessary in the completed units with the hard-to-explain names.

Two things put Imperial's refinery construction programs into high gear. One was the rapid growth in Canadian demand for oil products of all kinds and for improved products for the machines of today and tomorrow. The other was the great discoveries of oil in Alberta; plants had to be built or expanded to handle this flow of Canadian crude oil. Until Leduc a large area of the west relied on oil products brought in from the east but the Alberta discoveries changed the supply pattern—the west could become self-sufficient in oil if refineries were provided to treat the crude close at hand.

For a considerable period after the war, shortages of material and labor made large-scale refinery construction difficult. The first major project of Imperial's program was at Montreal East refinery where Canada's first fluid cat cracker was built in 1948.

In the same year Imperial erected a new refinery at Edmonton in a manner which circumvented the shortages of material and, for the time being, drove the news about the western oil fields from the

front pages. The Company bought from the U.S. Army a wartime refinery at Whitehorse in the Yukon Territory and transported it by road, rail and water to its new home at Edmonton. The journey of the 7,000-ton refinery down the Alaska Highway caught the imagination of Canadians and answered the pressing need for refinery capacity to handle the newly-discovered oil—but only for a short period.

Since then the multi-million dollar refinery expansion has been proceeding steadily. Two years ago, Imperial's ninth refinery went on stream when prod-

acts started to flow from the Winnipeg processing plant. At Edmonton, no sooner was the new refinery in operation than plans had to be made for further growth. The expansion program itself has been constantly expanding.

By the end of 1954 all the projects announced so far will be complete. Capacity of the Company's nine refineries will then be over 246,000 barrels a day, almost double what it was before the discovery of Leduc.

Imperial's annual report for 1952 showed that not only had the plant capacity been raised in many refineries, but also the Company's fluid catalytic cracking capacity had been increased from 18,100 to 51,000 barrels a day. By the end of this year it will be 66,450 barrels. Fluid catalytic cracking is the modern means by which refineries are able to produce gasoline of high-octane ratio to meet the requirements of present day automobiles.

In the report, G. L. Stewart stated that Imperial had again set records for the amount of oil produced, transported and refined, and for the volume of products sold.

Crude oil production rose 20 percent to nearly 28 million barrels, and refinery throughput jumped by nearly three million barrels to more than 70 million barrels. Sales rose from 25,698,171 barrels, or 2,649,130,985 gallons.

The Company's net earnings, after payment of all taxes, were up by more than $5 million to $41,196,499. On a per share basis this was equivalent to $1.38, of which 75 cents was paid in dividends to approximately 43,000 shareholders. The balance of 63 cents was retained for use in the business. In 1951 the earnings per share were $1.20 of which 65 cents went to the shareholders.

While income and earnings were up, taxes had also increased. Income taxes were estimated at more than $38 million against $24 million the year before.

Further expansion of the Company's producing, transportation, refining and marketing facilities excluding exploration expenditure, cost just over $71 million. Of this, $11.6 million was spent on transportation, $11.6 million on modernization of marketing equipment, $23.1 million on crude oil producing facilities, and $24.5 millions went to expanding and modernizing refineries.

Mr. Stewart gave some details of the refinery expansion program. A 10,000 barrel-a-day fluid cat cracker, the first of its kind to go into operation, went into service at Edmonton refinery last December. With it was added additional distillation and gas recovery equipment.

At the largest refinery in Canada, Imperial's Sarnia plant, was built the country's largest fluid cat cracker similar in design to the one at Edmonton. This 25,250 barrel-a-day giant began operation in the Spring.

Included in the Sarnia program was a 46,500 barrel-a-day atmospheric and vacuum distillation unit, and a new light ends recovery plant. Sarnia can now handle 71,000 barrels of oil a day, more than half the capacity of all Imperial's refineries in 1946.

On the Pacific coast, Imperial's Ioco refinery near Vancouver is also being expanded. The work will be completed in time for the 1953-1954 season and will result in a refinery with twice the present capacity. Most of the

Edmonton and Sarnia refineries when Imperial announced early this year even further expansion plans for the two plants.

At Edmonton, Imperial revealed it had engineering designs for what would be the first large-scale lubricating oil plant in western Canada. Capable of making 575,000 barrels a year of high quality auto-

motive and industrial oil from selected Alberta crude oils, it would be the second largest lubricating oil plant in Canada. Only the Sarnia lubricating plant would be larger.

Lube oil manufacturing is one of the most exacting refinery processes. Automotive oils must be highly tested to maintain their lubricating qualities and meet arduous quality requirements over a wide range of temperatures. The Edmonton plant would make Imperial's operations west of the Lakehead independent of lubricants from eastern Canada or the United States, except for certain specialties which are not in large demand.

At Sarnia the program included a new quality control laboratory, a mechanized packaging and shipping plant and centralized mechanical shops. The laboratory will house the equipment for testing products to make sure they are up to standard. The packaging and shipping plant will cope with the increased flow of products from the expanded refinery. The new machine shop will be the maintenance centre for the whole refinery.

In Quebec, work will begin this year at Imperial's large refinery in Montreal East to increase its capacity by 25 percent. When the program is finished sometime next year it will be the second largest refinery in Canada, with a daily capacity of 58,000 barrels. The fluid catalytic cracking unit, first in Canada in 1948, will be enlarged. New equipment will also be added— an atmospheric and vacuum distillation unit and a vacuum pipe still. When the Quebec program is finished, the refinery will have more than 16 times the capacity it had when it began to operate in 1916.

Winnipeg refinery, still spanking new after its two years of operation, is due for growth. Early this year an addition was announced which will boost the production of top-quality gasoline. This year a catalytic
and better plants and further improvement in product quality.

It means annual savings in hard cash for the national treasury. This saving increases in size as Canada’s refineries increase in size. In 1947 Canada imported more than 90 percent of its oil requirements. Part of these imports were crude oil for Canadian refineries; part of them were products ready for use.

The finding of large oil fields in the western provinces cut down our need for crude imports. This meant we did not have to pay out American dollars for imported crude.

The tremendous increase in refinery capacity is chipping down the need for imports and consequently saving still more U.S. funds for the national cash register.

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He’s Lucky to Be Alive

On the night of February 4, 1942, the Imperial motorship Montrose was on route from Guiria to Halifax with a cargo of Venezuelan crude for Canada’s oil-hungry refineries. Since in that particular year the eastern Atlantic seaboard, crawling with U-boats, was not the safest place in the world for oil tankers, the Montrose was running without lights.

That didn’t save her.

Just after eight o’clock, a torpedo came out of the stormy darkness and struck the Montrose amidships. Flames shot into the air and the acrid fumes of TNT hung over the water. The stricken ship shuddered and rolled helplessly, her black, precious cargo vomiting out her gaping side.

The crew of 48 men had been busy at normal shipboard occupations when the torpedo struck. Ever-present danger is something men must get used to if wars are going to be fought and won. On the bridge and in the engine room the usual watches were on duty. In the crew’s quarters aft, off-duty personnel were clustered around the radio, listening to a Lowell Thomas newscast.

Among them was a 42-year-old pumpman named Carleton Augustus Winchester Hayrock, a veteran of 19 years with Imperial’s tanker fleet.
The German had tried to kill Carleton Haycock once before, and hadn’t succeeded. This time, as the Montréal heeled over in the oil-covered waves and the U-boat manoeuvred into position for a second torpedo, their chances looked brighter.

Because of the rough seas, the tanker’s lifeboats had been given additional lashings. Precious minutes were lost in getting them clear, minutes which might mean the difference between life and death for the 46 men on the ship.

One lifeboat finally pulled away with three of the crew. Another took the skipper, Capt. Jack White, and 24 others. Neither boat was ever seen again. A third lifeboat was launched. Nineteen men crowded into it, shouting to Haycock to hurry before it was too late. He tried to reach them but the Montréal’s wet, slippery decks were eluding too steeply. There was nothing for it but to go overboard into the turbulent water.

Haycock hit the water hard, and the impact drove his lifebelt stinging against his chin. He learned later that the blow had broken his neck.

He found himself in a sea of oil which seemed a foot thick. The treacly, foul-smelling stuff choked and blinded him and made swimming almost impossible. Yet somehow he struggled toward the lifeboat whose silhouette he could just make out in the darkness.

The shouted encouragement of his shipmates helped and so did the courage and determination of a man who had been once before face-to-face with death in wartime. He reached the lifeboat and willing hands dragged him over the gunwale.

The rest, considering the things that happened to Carleton Haycock both before and after that February night, is almost anti-climax. The 39 survivors saw the Montréal take another torpedo, burn, and sink. For three days they drifted helplessly in freezing, gale-lashed seas. Finally they were picked up by a British freighter, which landed them in Halifax.

Haycock was hospitalized, not for his injury but for exposure. The doctors didn’t discover the hidden fracture there or during two subsequent visits. It finally came to light in Montreal in 1946. The specialist who found it could only shrug his shoulders. The break was too close to vital nerves to permit an operation. The patient was told to take things easy and avoid sudden strains.

It was no doubt sound advice, but it must have sound ed a little academic to a man who has returned from the dead at least three times in his 63 years, the last occasion coming only this past Christmas.

The story of Carleton Augustus Winchester Haycock is as unusual as his name, and in a way interwoven with it.

The setting for a large part of the story is Nova Scotia where Haycock was born Carleton Augustus Winchester at Westport in the first year of the century. When he was three, his fisherman father was lost at sea. His ailing mother, unable to support the boy and his older sister, Florence, was forced to place Carleton for adoption with Capt. and Mrs. Gus Haycock of Digby, Nova Scotia, who brought him up as their own son.

In the second year of World War I, Haycock was just 15, but like so many other patriotic youths he told a gullible or co-operative recruiting sergeant that he was 18. He went overseas the next fall with the 85th Highlanders, and in due course found himself fighting with his regiment in that muddy blood-bath called Passchendaele.

The 85th went into the battle with 900 men; they came out with 150, and without Carleton Haycock. Seriously wounded in both legs by German machine-gunners, Haycock lay in the mud until dark, then crawled to his regimental aid post. After emergency treatment, he was sent through medical channels to a base hospital where he remained for seven months.

Meanwhile, the War Office had sent the Haycocks a report which led them to believe that Carleton had been killed, and they in turn notified Mrs. Winchester to this effect. Carleton’s real mother moved to Maine soon afterwards, where she married a Mr. Jesse Hayward, still believing her son to be dead.

Upon his release from hospital, Haycock returned home. Capt. Haycock, his foster father, had died during his absence, and Carleton took up civilian life in the belief that Mrs. Haycock was his only “family.”

In 1921, he joined Imperial’s tanker fleet as fireman on the old Miss Brem. In the years before World War II he was an engineer officer on no less than eight of the Company’s ships.

Old man Nemesis never let him far out of sight. His war wounds had left him somewhat less than normally nimble, and he proved to be somewhat more than normally accident-prone. A heavy leg fell on one foot, crushing it. He tripped on a street-car step and broke an arm. A tumble into a pit resulted in a shoulder dislocation. An eight-foot fall due to a misplaced pump room plate broke several ribs. Through it all, Haycock preserved his reputation for indomitable will power. After each bout with misfortune, he bounded back for more.

Then came the Montréal sinking. Very soon after the war, Mrs. Haycock died, and Carleton assumed that he was an orphan. He was due, and long overdue, for a bit of good luck, but it was still to evade him for more than five years.

Not so the courting of disaster for which he seemed to have a strange affinity. He was involved in a couple of minor collisions, and then in a major one. It occurred about three years ago, when Haycock’s ship collided with another tanker in a drifting fog. Fire broke out, which fortunately was prevented from spreading to the cargo, but one man was burned seriously. For some strange reason that man was not Carleton Haycock.

And that brings us up to last year, a little before Christmas, when James “Archie” Hayward, a fisherman from Jonaquip, Maine, put in to Westport, Nova Scotia. Archie had often talked with his mother about her son (and Archie’s stepbrother) who had been killed in the first world war. Now he mentioned Carleton Haycock to a Westport storekeeper.

“Haven’t seen Carleton in pretty close to a year,” the storekeeper remarked. “How’s he keeping?”

Archie Hayward gulped. “A year? Why, Carleton was killed at Passchendaele.”

It took but a few minutes for the storekeeper to convince the incredulous Archie that his stepbrother was most assuredly living, albeit on borrowed time. He suggested that Archie get in touch with Carleton through Imperial’s marine people.

Making inquiries, Archie learned that his stepbrother was at sea in the Imperial Charlottetown as 4th engineer, and a letter was soon on its way.

Last Christmas, there was a reunion at Jonaquip. Present were Carleton Haycock, his mother, now 73, his stepfather, and his stepbrothers Archie and Oscar. Carleton and Mrs. Hayward had a lot to talk about—nearly 35 years’ worth. Another and even bigger reunion is planned for Nova Scotia this coming summer. Carleton’s sister will attend that one. She is now Mrs. Florence Greenlaw, of Canoe, Nova Scotia.

Carleton Augustus Winchester Haycock is due to retire in a few years. Most men look forward to spending their declining years with their memories. Carleton, the man who made almost a habit of returning from the dead, has more than his share of them.
Along the Mackenzie River, fighters and bombers roared overhead, bombing and strafing "enemy" troops and positions. Troop carrier planes filled the air with parachuting relief troops and equipment.

On the ground, machine guns spat viciously at surging files of soldiers on snowshoes seeking shelter in the snow-laden scrub patches ringing the airfield and refinery. Any movement was likely to bring the sharp crack of a rifle as white-clad snipers hidden in snowbanks penned the "enemy" forces down to the small amount of ground they had captured in their surprise attack from the skies.

For a week Imperial's Norman Wells refinery, and the adjoining airstrip, deep in the sub-arctic, were held by the enemy. But before the capture, the refinery was rendered useless to the attackers and part of the refinery staff, members of a little-known reserve force called the Canadian Militia Rangers, took to the bush to harass the enemy and wait for reinforcements from the air.

The "war" was the week-long Army-RCAF training scheme "Exercise Bulldog", held in and around Imperial's installations in the Northwest Territories, less than 100 miles outside the Arctic Circle. "Bulldog" was carried out under conditions as close to actual arctic warfare as possible. It was the largest all-Canadian airborne operation held in Canada, and the first time the Canadian Rangers, our first military line of defence in the north, were used in the active army during an exercise.

The men of No. 21 Ranger Company, all Imperial employees, first reported the "enemy invasion" and worked closely with the relieving forces throughout the exercise.

Ranger companies are dotted through the Northwest Territories and other isolated areas. They are a part of the reserve army and, like the historic Rogers' Rangers, carry out operations which cannot be performed conveniently by the regular army in territory that few people know well.

They organize troops for their own locality and serve as "front line" troops for local defense against small enemy groups which might land in their areas. They arrange for civilian protection, rescue work and--knowing the northland as most of us know our own back gardens--they act as guides and scouts for regular army forces. During the year they collect and document information about their local area and carry out regular training with small arms.

The Norman Wells company is under the command of Capt. K. Murray Mackenzie, superintendent of the refinery. More than half of it is made up of veterans of one or other of the armed forces.

Relieving forces soon came to the assistance of the Rangers. Out of the sky dropped paratroopers of the 2nd Battalion Princess Pats.
function under an operating committee of three (Cyril Finlay, refinery foreman; Rollie Gibb, mechanical foreman; and Stan Gilbert, laboratory superintendent) with reduced staff. Only nine of the Rangers took part in the exercise. They operated from prepared quarters in the bush.

Next day, friendly reconnaissance planes flew over the area. They were followed by “softening up” bombing attacks by RCAP light bombers. On the ground the Rangers were walking and sniping the enemy entrenched in Norman Wells.

Behind the light bombers came the first wave of relief force paratroopers. They were dropped onto the surface of a small lake not far from the enemy-held airstrip and refinery.

Confusion existed for a short time after the drop. Soldiers were scattered all over the lake surface and three men were hanging in trees. As the paratroopers hit the ground, Rangers glided out of the bush to help them regroup. At the same time other Rangers took up positions nearby to deter any enemy patrols that had ambitions about ambushing the paratroopers. Paratroop officers were briefed on the local situation by Rangers.

In the dropping zone, airbone medical corps personnel under Major J. E. Gilbert of Barrie, Ont., who had dropped with the assault troops, were setting up medical aid stations. The first casualty was Capt. C. S. Robertson of Winnipeg and Calgary. He broke a leg landing, and was removed to the 14th Reserve Hospital where he was cared for by Imperial’s resident physician, Dr. Robin H. Thorp, of Westlock, Alta., a former Royal Navy man. Capt. Robertson was later evacuated by air.

Days later, guided and scouted by Rangers, the friendly assault troops (elements of the 2nd Battalion, PPCLI) stormed Norman Wells to dislodge the enemy forces. As all the Rangers knew every inch of the Norman Wells country, patrols of the assault forces were soon probing the frozen lake’s land separating them from enemy-held positions.

Shortly after the friendly paratroops had secured the dropping zone, a glider towed from Fort Nelson was cut loose from the towing plane and landed on the frozen snow-packed lake surface. Meanwhile RCAP light bombers continued to attack targets on the Mackenzie River, specially built to simulate the Norman Wells airstrip and installations held by the enemy. The planes used live 500-pound bombs and live strafing ammunition.

Behind the glider came the second wave of relief paratroopers, and one of the most fantastic incidents in Canadian army history. During the drop 18-year-old Jim Bodnar of Mission City, B.C., was suspended for 30 minutes by his rifle slung from the belly of a circling transport plane.

Sixth in the landing line, Bodnar went through the door of the plane and by some freak accident his rifle slung became entangled and he was left hanging by its thin thread hundreds of feet in the air.

After capturing the refinery and airfield the attacking force set up a limited camp and dug in alongside the landing strip.
hospital to see Bodner. In his gruff voice he said, “Well, sonny, you’ll have a fine tale to tell them when you get back.”

“But sir,” said Bodner rather plaintively, “they won’t believe me”.

“Won’t believe you!” boomed the general, “You’ve got 300 witnesses here, and if they won’t believe them, you send for me”.

During the day supplies for the friendly forces were parachuted to them by the RCAF. At the same time air strikes mounted in intensity as light bombers carried the war to the enemy. Continuous visual and photo air reconnaissance, together with Ranger ground patrols, maintained a vital flow of information on enemy activities. Aggressive patrols inflicted casualties on the enemy and brought in two prisoners.

The Canadian Rangers lost their first man when Ranger Eddie Hodgson was captured. Before his capture, he had his brief fling at glory. He led a patrol with a military umpire—over the hilly Norman Wells country for seven hours. At the end of the seven hours, the patrol—and the umpire—were all in. The umpire was quite convinced of the efficiency of Ranger patrols. As a prisoner, Eddie proved just as efficient. All that enemy intelligence officers could get out of him was his name.

Simulated casualties among the friendly forces were evacuated under difficult conditions from the dropping zone by an RCAF ski-equipped Dakota and flown to Port Nelson.

When night fell on the sixth day the enemy forces were still firmly entrenched. But at dawn the next day, a ground attack under Major Don Grant of Toronto and Vancouver successfully dislodged the enemy. Shortly after eight a.m. General Vokes called the “Cease fire!” Exercise Bulldog was at an end. Within 48 hours all troops that had taken part were air-evacuated from Norman Wells.

Peace descended again on the isolated little community of 125 souls. In the refinery, Murray Mackenzie shed his rank of Ranger captain and role of base umpire, and turned again to his duties as refinery superintendent. His second-in-command, Lt. Hanson, who served as Ranger field commander, once again became the refinery chief clerk.

Things were back to normal, but nine Imperial employees had proven to the satisfaction of one of Canada’s crack wartime commanders that the Rangers have a vital role in the defence of the north and— at Norman Wells at least—they are equipped and ready to play that role efficiently.

Enemy troops ringed the captured airfield and refinery with machine gun emplacements often hidden in the snow.

**Personalities in the News**

**B. C. Kitchen Retires**

B. C. Kitchen, after 40 years with Imperial, has retired from the position of general purchasing agent. Born in Petrolia, Ont., Mr. Kitchen’s first position with the Company was in the manufacturing-accounting department at Sarnia. In 1915 he transferred to International Petroleum in Toronto (then an affiliate) and did not return to Imperial until 1923 when he was appointed assistant purchasing agent. He became head of the department in 1949. During World War II, Mr. Kitchen was on loan for two years to Polymer Corporation as co-ordinator of purchasers.

**A. E. Rubery, Manager, Purchasing Department**

Albert E. Rubery has succeeded Mr. Kitchen as head of Imperial’s purchasing department. Mr. Rubery has been with the Company since 1920 when he joined it as a buyer. In 1924 when the Ardian National Corp. was building a pipe line in Columbia he transferred to that company as purchasing agent. Four years later he returned to the Company as buying division chief. He was made assistant general purchasing agent in 1944. Mr. Rubery is originally from Kingston, Ont. and served overseas in World War I with the Canadian Field Artillery.

**W. T. A. Bell, Manager, Industrial And Consumer Development**

W. T. A. Bell has been transferred to the main office of the Company’s marketing department as manager of industrial and consumer development. A native of Beeton, Ont., he was educated at Winnipeg, Calgary and Toronto. He is a mechanical engineer graduated from the University of Toronto and has experience as a sales engineer in the heavy machinery industry. In 1953 Mr. Ball joined Imperial’s marketing department as a salesman in southwestern Ontario. He spent a few months in 1954 as an industrial engineer in Hamilton before moving to Ontario department to head industrial sales. Later he acted as merchandize co-ordinator for the division. He was transferred to the west coast in 1940 as sales manager of the British Columbia division. Two years later he went east to head Quebec marketing and in 1950 took over as manager of Ontario division.

**T. B. Doherty, Management Assistant, Manufacturing**

Thomas B. Doherty has been appointed management assistant, manufacturing department. A native of Sarnia, Ont., Mr. Doherty received his early schooling there before going to Queen’s University for a degree in chemical engineering. He obtained his master’s degree from the Massachusetts Institute of Technology. His career with Imperial began in 1938 as a process engineer in his home town but was interrupted for five years during World War II when he served with the armed forces. He returned to Sarnia to work with the engineering division and in 1950 transferred to his previous position as assistant superintendent at Edmonton.

**R. H. Smith Transfers From International Petroleum**

After seven years with International Petroleum, Roy H. Smith has returned to Imperial Oil as assistant manager of the co-ordination and economics department. A Maritimer by birth, Mr. Smith attended Picton Academy and Mount Allison University and finally McGill University where he graduated as a chemical engineer in 1921. He joined the Company in 1923 as a chemist at Sarnia and transferred to Leduc in 1926 as chief chemist. He held various other positions in the manufacturing department and in 1943 was promoted to assistant chief engineer of that department. He left this position to go to International Petroleum, to advise on crude oil sales and manufacturing and pipe line operations.
J. E. Akitt, Honda Ontario Division

J. E. Akitt has succeeded W. T. A. Bell as manager of Ontario division. During the past three years he has been at the main office of the marketing department, first as western regional manager and then sales co-ordinator for the eastern divisions. Originally from Horning’s Mills, Ont., Mr. Akitt, a veteran of World War I, joined Imperial in 1955 as a salesman in Saskatoon. He also served the company in Edmonton and Calgary. In 1945 he was appointed co-ordinator of western farm sales working out of Regina. He became division manager of Saskatchewan in 1947 and of Manitoba in 1948.

R. D. Murray Appointed to Quebec Division

Robert D. Murray has transferred to his home town of Montreal to take over Mr. Patterson’s position as assistant manager of Quebec marketing division. Mr. Murray is a graduate in arts and law from McGill University and served with the Canadian army in World War II in Europe and the Pacific. Since 1938 when he joined Imperial, he had had varied experiences with the company including statistical, accounting and personnel work. After demobilization in 1945, he spent a year as legal assistant in Quebec division and five years as assistant secretary of the company at Toronto. He was made assistant to the general manager of the marketing department in March, 1952.

L. W. White, Assistant to General Manager, Marketing

L. W. White joined Imperial Oil in Winnipeg in 1940. His first job with the company was as assistant cashier. After working in the Winnipeg office and in the Manitoba division in various capacities he became resident manager of Fort William and Port Arthur. He returned to Winnipeg in 1941 as district manager and four years later moved to Alberta division as sales manager. In 1950 he became assistant manager of Alberta division and in the fall of 1951 transferred to Ontario division as assistant manager. He received his present appointment this spring.

R. S. Ritchie, Assistant Manager, Ontario Division

Succeeding Mr. White is Ronald S. Ritchie who has been an assistant to Mr. Akitt since last December. Mr. Ritchie was born near Chatham and attended the University of Western Ontario where he graduated in political economy in 1946. After postgraduate work at Queen’s University, he taught economics and accounting for a year at the Ontario Agricultural College. During World War II he was with the Wartime Prices and Trade Board. In 1947 he joined Imperial’s co-ordination and economics department, becoming assistant manager three years later. He held that position until going to Ontario division last year.

K. D. MacDonald Retires

Retiring as manager of Imperial’s asphalt sales, Kenneth D. MacDonald is a charter member of that department. He joined Imperial as an asphalt sales engineer in 1919 at the time the department was set up. He became assistant manager in 1945 and manager in 1950. Mr. MacDonald was born in Prince County and went to school in nearby York Water. He is a graduate in civil engineering from the University of Toronto and a veteran of World War I. He served overseas with the Canadian Field Artillery and was wounded at the Ypres front.

A. E. Patterson Retires

A. E. Patterson, assistant division manager of Quebec marketing for the past five years, has retired. All of his career with Imperial was in Quebec division with headquarters in his native Montreal. His first position with the company was as road engineer in the asphalt sales department in 1924. Three years later he was put in charge of sales of asphalt and fuel oil with burner sales added in 1932. He became assistant sales manager in Montreal in 1938, district manager in 1945 and sales manager of Quebec division a year later. In 1948 he took over the duties he left upon retirement, Mr. Patterson is a graduate of civil engineering of McGill.

E. L. Paterson, Manager, Asphalt Sales

E. L. Paterson has been promoted from assistant manager of asphalt sales to succeed K. D. MacDonald. A graduate of the University of Toronto in civil engineering, Mr. Paterson was a road engineer for various contractors before joining Imperial’s marketing department in Hamilton in 1953. Five years later he was transferred to Vancouver as asphalt sales engineer for the province and B.C. In 1946 he became supervisor of asphalt sales for that territory. He went to Toronto in 1960 as assistant manager of asphalt sales.

RECEIVE 10-YEAR SERVICE BUTTONS

J. Dean Bradley, Manufacturing, Toronto

J. Dean Bradley, assistant general manager of the manufacturing department, joined Imperial 40 years ago at Sarnia. His first job was packing grease. Within a few months he was transferred to the accounting department where he remained for 10 years. In 1923 he transferred to his present department and was appointed process foreman. Eight years later he became assistant to the superintendent of Sarnia refinery and was named superintendent in 1934, general superintendent in 1941. Later that year he came to Toronto as manager of the opening division of the manufacturing department. He received his present appointment in 1956.

John Hough, Manufacturing, Toronto

John Hough, originally from Adlington, England, came to Canada in 1912 and joined the company as a clerk at Fort William. In 1921 he transferred to the cost and yield department at Sarnia refinery. Two years later he went to Tolito, Peru, to head the cost and yield department of International Petroleum. He was promoted to chief clerk and returned to Canada in 1951. At that time he became a statistician in the manufacturing department, Toronto, and in 1948 took over the duties of co-ordinator of refinery operations and economics survey. In 1959 he became assistant manager of refining co-ordination division, his present appointment.

L. J. Zink, Sarnia Refinery

Lloyd J. Zink has completed 40 years of service at the refinery in his native Sarnia. He left school at the age of 15 to start work in the grease plant. In 1915 he was assigned to the blending of specialty oils and, except for three years on overseas service with the Canadian Field Artillery in World War I, he remained in that section until 1932. He is at present a foreman in the grease plant, a position he has held for some years. Mr. Zink is a sports enthusiast but for the last two years has spent his spare time working on his new home at Port Franka, near Sarnia.

C. W. Tait, Lacoo Refinery

Charles W. Tait, also from London, Ont., joined the company at the age of 13 at Sarnia refinery. As soon as he reached enlistment age, he joined up and served for three years with the army in World War I. He returned to Sarnia upon discharge and in 1924 was transferred to the Tropical Oil Co. in Colombia as a stillman. He returned to Sarnia in the late twenties and shortly after moved to Imperial’s west coast refinery at Ioco. He has been head taster there since 1945. Mr. Tait is active in community organizations and is a member of the Knights of Pythias.

Roméo Dicairle, Quebec Marketing

Roméo Dicairle, marine agent at Notre Dame terminal, has been with the Quebec marketing division for over 40 years. Born and educated in Montreal, he joined Imperial as general clerk at the Cote St. Paul Plant. He was later promoted to cashier, then shipping clerk. While he was at Cote St. Paul, tank trucks replaced the horse-drawn tank wagons cutting a 25-mile delivery from two days to three hours. Off duty, Mr. Dicairle spends his time gardening or making furniture for his home.
A. G. DeMont 1896-1953

A. Gordon DeMont, an Imperial director, died on March 20 at Sunnybrook Military Hospital in Toronto after a brief illness. He was 57 years of age and had been with the Company since returning from overseas at the end of World War I. In the intervening 22 years, he had risen from warehouse agent.

Mr. DeMont was a specialist in marketing Imperial's products. He spent 14 years with the Maritime marketing division and became division manager. He went to Toronto in 1935 as supervisor of branches. After various promotions, he became, in 1947, general manager of the marketing department. He gave up this position last year to devote his full time to the duties of director, which he had assumed in 1951.

Mr. DeMont's warm personality made him many friends both in and outside the Company. In spite of many interests, he always found time to give a helping hand to those who needed it. He was especially fond of young people and many a young man received the benefit of his wise counsel and good guidance.

After a funeral service at Yorkminster Baptist Church, Mr. DeMont was buried at York Cemetery in Toronto. Honorary pallbearers were the members of the board of directors together with other senior officials of the Company.

He is survived by his widow, the former Mabel Moffatt of North Sydney, N.S. and a daughter, Mrs. C. M. Thompson, of Toronto.

FORTY YEARS OF SERVICE (continued)

R. W. Rigby, Sarnia Refinery

R. Walter Rigby, chief accountant at Sarnia refinery, has been with Imperial since 1912 when he went into the Treasurer's office. Since that time he has also worked with the marketing and manufacturing departments in Calgary and Toronto. In 1933 he joined the marketing accounting department at Sarnia and remained there until 1949 when he took over his present duties. During World War I, he served overseas with the 146th, 161st and 47th infantry regiments and was hospitalized due to the effects of a gas shell. Mr. Rigby has served in executive positions with the Red Cross and Canadian Legion. He is a native of London, Ont.

H. S. Humble, Sarnia Refinery

Howard S. Humble, a mechanic in the machine shop at Sarnia refinery, has been with Imperial since September 1912. Mr. Humble was born near Ailsa Craig in southwestern Ontario and went to school in that area. His first job with the Company was in the car repair department. Two years later he became a helper in the hoisting department. In 1915 he went on the hoist as an operator and held this position until the Spring of 1952 when he transferred to the machine shop. Mr. Humble likes to travel and is planning a tour which he will take upon retirement in 1955.

James Cruickshank, B.C. Marketing

Jim Cruickshank, a native of Aberdeen, Scotland, emigrated to Canada when he was 19. In 1913 he joined Imperial's marketing department at Vancouver as a chauffeur and drove until he enlisted with the Seaforth Highlanders in World War I. He served in France and returned to the Company in 1919 as a tank wagon driver. In 1948 he became a loader. When Mr. Cruickshank first joined the Company, horses were being used to draw the wagons. Trucks soon took their place but to this day Jim is fond of horses. His daughter Shirley, the youngest of the Cruickshank family, works for the Company as a key punch operator.

POWER BY THE GALLON

The story of gasoline

Man has known of the existence of petroleum for something like 6,000 years. For perhaps 100 years he has been aware of the fact that one of its constituents was a volatile and highly inflammable substance called gasoline.

Until about 60 years ago, he wouldn't—literally—take gasoline as a gift. Now he's racking his brains for ways of obtaining more and better gasoline from every barrel of crude oil he extracts from the earth.

The gasoline that he has today—1953's gasoline—is so thoroughly superior to yesterday's that you wouldn't believe it was the same product. For that matter, it isn't. A modern premium grade may contain a third or less of what grandfather called gasoline. The rest? That's what this story is about.

Petroleum refining had its start when people first learned that by lighting a fire under a tub of crude they could break the oil down into a series of different products. What they were looking for primarily was something that could be burned in the wick lamps of that day without scorching the wicks or producing fumes offensive to sensitive noses.

Kerosene was the answer, and thus became the staple stock in trade of early refiners. After the kerosene had distilled off there was a heavy oil remaining which proved a better lubricant than beer grease though it left a lot to be desired when compared to modern lubricating oils.

Before the kerosene distilled off, they got a clear liquid with a pungent odor and a tendency to cause a lot of trouble when exposed to an open flame—as many a pioneer refiner learned to his sorrow when he watched his plant burn down. It was no good in lamps because they promptly exploded. Because no other
sylvans enterprise men had started digging wells to get oil for commercial purposes. The early for-runners of Imperial's Serna refinery were built to process the petroleum. Soon considerable quantities of kerosene were being sold and the surplus gasoline disposed of in whatever ways came to mind.

To a Boston engineer named George H. Brayton goes the credit for introducing the unwanted fuel to an engine which had the ability to go places if it had the right partner. In 1876 he designed and exhibited an engine which burned gasoline.

Brayton's engine took its gasoline raw, as a liquid, which was wasteful and inefficient yet quite unavoidable because there was no such thing as a carburetor. About five years later a Frenchman, Fernand Forest, rectified that. In 1880, Carl Benz put Forest's carburetor on an engine designed by a fellow-German Gottlieb Daimler, installed it on a tricycle mounting, and had the first modern automobile.

The test is history. In 1897, there was one gasoline-powered motor vehicle (a Daimler-Henry) in Canada. In 1901, there were 220, in 1906 nearly three million. The aeroplane lagged behind the automobile, but not by much, once the gasoline engine solved the problem of light, mobile power. On Dec. 17, 1903, at Kitty Hawk, N.C., the Wright brothers raised the curtain on the Air Age.

The early engines were crude things, and so was the gasoline they used. It was just the stuff that was distilled off before the refineries came to the "valuable" kerosene fractions. Grades and octane ratings were unknown. Quality was "controlled" entirely by the sort of crude used and by the refiner's whim. (Remem-ber that, at the turn of the century when the first demand for gasoline was growing, Imperial Oil had been in business for more than 20 years, and its proceeds financed more than that. The business had been built on kerosene and certain heavy oils. No one could be expected to give much time or thought to a product which had previously been nothing but a nuisance and was to go into a contraction which, according to opinion, "would never replace the horse").

Backbone of any refineries in those days, and for nearly two decades afterwards, was the batch still. It was an iron or steel tank mounted between brick walls, with a space beneath for a few. As the crude oil was heated, it vaporized and passed over into a condenser, which was a coil of pipe cooled by running water. Only one product could be produced at one time, and even the one product varied widely from batch to batch.

To do the motors of the 1900's, that didn't matter much. They had so many ailments that a little thing like variations in fuel made little difference.  

**WHAT THE MOTORIST WANTED**

But engines improved rapidly, and as they did so, there emerged specifications of a sort. At first, these concerned color and specific gravity, about the only standards available. Gradually, automotive people began to ask other things of their fuel, or perhaps to explain more clearly what they had always wanted. Some of these were volatility to permit easy starting even in cold weather, few vapor pressure to avoid fumes accumulating in fuel lines and causing "vapor lock", freedom from odor, and so on.

The batch still gave way to a battery of stills and finally to the modern pipe still, in which the temperature of the crude oil can be controlled very closely. To sort out the petroleum vapors more pre-cisely, condensers were set up in series, and finally superseded by the modern fractionating tower, in which the vaporized oil is fed into a tall tower containing as many as 25 or 30 perforated trays on which the vapors condense, heaviest fractions being at the bottom, lightest at the top, gasoline being one of those at or near the top.

All of these refining improvements produced gas-

**FIRST CANADIAN-OWNED CAR**

Dutch physician Christian Hygeius invented the engine shown below using gas-pumpode for fuel

Picture of a Daimler-Benz Type 1898 "Benz Victoria" shown by early (photograph) with pioneers-builder Carl Benz himself at the tiller-har

**FIRST AUTOMOBILE DRIVEN IN CANADA**

Nicholas Otto (corner) hailed from four-cycle engine essentially that used today
Cracking lessened one problem but aggravated another. While it knocked less, the cracked gasoline also showed a disturbing tendency to produce gummy substances which did the engine's more sensitive parts no good at all. Imperial researchers solved this problem first by a treatment to remove the gum-producing substances, and later by addition of a non-petroleum "inhibitor" to prevent gum from forming.

PUTTING ZIP INTO 1926 GASOLINE

By the standards of the day, this mixture of straight-run and cracked gasoline, which its gum formation inhibited, was pretty good. This is what you bought at the pump in the early twenties, when the Auto-motive Age came into full swing. But it was known that if engine compression ratios could be raised without causing detonation, automobiles, and especially aeroplanes, would have better performance. Gasoline needed more zip, and it needed an even more effective knock reducer.

"Light ends" gave it the first, tetraethyl lead the second. Light ends are those parts of petroleum right up at the top of the volatility scale, produced both by distillation and by cracking. Added to gasoline, they give it that extra something which means quicker starts in any weather.

In looking for their anti-knock agent, the chemists investigated this agreeable discovery. They found that in high-compression engines straight-run gasoline tended to go off with a bang, like an artillery shell when it lands, and gave the piston a blow rather than a shove. Cracked gasoline burned more evenly giving a strong, steady shove, like the charge which sends a shell on its way.

Soon after formation of the Company, Imperial concentrated its refining facilities at Petrolia, conveniently close to the crude oil source.

Good care is exercised in adding tetraethyl lead to sample of gasoline before octane rating test. TEL cuts down knock and gives nice warm-up and good mileage, doesn't knock in the engines for which it's designed, and helps to keep the engine clean and free from gum and sludge.

Of course, it's not enough just to know the qualities that an ideal gasoline requires. It's the "balance" which counts. Any refinery can turn out a gasoline which will start at a hot glance, but you'd get very poor mileage. Conversely, a heavy fuel oil might (theoretically) give mileage to warm a miser's heart, but you'd have to start your motor with a blowtorch.

To get the right balance has taken years of patient work by the "back room boys". Experience, constant sampling of customer requirements, and such things as climate surveys show them which qualities to stress for seasonal and geographical needs.

Climate surveys are detailed and exhaustive. The research improves performance.

The researchers have had a hand in a long series of improvements which have kept Imperial in the foremost rank of petroleum development. Most of the developments, of course, are technical and thus comprehensible only to refinery experts—things like the Company's work in the phenol treatment of lubricating oil—a process which has been adapted for use throughout the world, clay treatment of naphthas, and so on. To the man at the wheel, they have meant steady improvement in his car's performance.

Any refinery process has its origin in the laboratory. When a new development looks good in the test tube, it receives exhaustive trials, first in laboratory testing...
equipment and then in actual automobile engines. These are run for long periods at steady high speeds, or at varying speeds, while instruments record several kinds of engine reaction. At the conclusion of each test, the motor is torn down by expert mechanics and carefully examined for signs of undue wear, corrosion, or deposits.

Imperial's researchers at Sarnia take pride in being the first in Canada to use the mobile "test car", a standard model fitted with dials and gadgets for judging a new gasoline on the road at all speeds—just as the motorist will use it.

This is important in view of the fact, known for some time, that two gasoline of identical laboratory octane-rating may behave differently in actual use.

When the chemists are satisfied that a newly-developed gasoline is ready for the market, refinery equipment must be designed and built to manufacture it in quantity. Here the engineering department takes a hand. Over the years, much of the equipment which has gone into Imperial refineries has been designed by the Company's own engineers.

The engineers' job is to translate laboratory improvements into large-scale refinery processes. As a result, one Imperial refinery after another has undergone a major face-lifting until today the Company

Using the spectroscope is a specialized job which requires training and experience. Instrument is used for analysis of petroleum samples

This modern world the name of his art leads to some confusion. "I prefer the word 'scrollcraft'," he says. "People today often think that 'illumining' must refer to electric lights"
ELIZABETH
the Second,
by the grace of GOD
of the United Kingdom,
CANADA and her other
realms and territories
QUEEN, Head
of the Commonwealth,
DEFENDER of the FAITH