What would a national energy authority mean to Canadians?

Because Canada, more than most countries, depends for its well-being on abundant, economic supplies of energy, the proposal for a national authority deserves close study and the most thoughtful consideration. The actions of such a board will affect the lives of every citizen.

In determining the scope and powers of such an authority, certain considerations should be kept in mind:

(1) Canada’s energy consumption has grown at a record rate—by 43 percent between 1947 and 1957. Would it have grown any faster under an authority?

(2) Our energy production has grown even faster. In petroleum alone it has increased 26 times in 11 years, with enough reserves discovered in that time to last Canada 280 years at present rates of consumption. When an authority could the growth have been any greater?

(3) Total investment in energy industries has grown rapidly. In the oil industry, for instance, exploration and development expenditures rose 28 times between 1946 and 1957. Would greater regulation stimulate or discourage investment?

(4) There already exist in the hands of the appropriate municipal, provincial and federal governments, powers to regulate energy production, transmission and sale. Are these powers now improperly used? Can it be assumed that they would be wielded more effectively by a centralized body? Is it necessary to duplicate these powers?

(5) Canadian consumers, exercising the free choice of the market place, can now decide among the various forms of energy the ones which suit their own needs best. Would an authority add anything to this freedom of choice?

(6) Would there be any danger of such an authority, interested with wide powers, penalizing producers or consumers of any region for the supposed benefit of other regions?

No one can argue that Canada should not have a national energy policy for the best use of its energy resources for the benefit of all its people, now and in the future. It is evident, too, that collection and assessment of all the needed information about our resources would help to arrive at the best energy policy. The question which must concern every Canadian is whether this desirable goal carries with it the threat of unwise controls over a growing, dynamic industry.
Industry and Education

Industrial support of education is a twentieth century phenomenon. There are no precedents, no rules, no examples to guide the donors. Corporate giving has grown Topsy-like. Companies have responded instinctively. In the nineteenth century, industries made few donations. Industrialists—millionaires like Andrew Carnegie, John D. Rockefeller and Cecil Rhodes—contributed heavily. Corporations have taken heir to the functions once performed by these private individuals.

Imperial Oil made its first grant to education in the mid-20s. Since then, its contributions have reached the millions. By 1940, the company had made grants of $200,000. This was the end of World War II, when funds were once again available for donations. Another factor was a change in the corporation tax structure which made it possible for companies to write off a limited amount of charitable expenditures as allowable deductions from their taxes.

Today Imperial spends hundreds of thousands of dollars a year to help raise education standards in Canada. Most of the money goes for capital grants to universities (last year, the company contributed to 31 institutions of higher education). In addition, the company operates an extensive university scholarship and fellowship program and makes grants-in-aid to Canadian universities attended by scholarship holders and fellows. Moemies are donated each year to universities for specified research projects. And, while universities absorb the lion’s share of its corporate gifts, primarily and secondary institutions benefit through Imperial’s sponsorship of teachers’ exchange burials and through donations—$100,000, to be spread over the five years 1957 to 1961—to the Canadian Education Association.

Why should industry help education? Why not build another factory instead, or raise employees’ salaries or use the money to boost dividends? Or does industry believe it has an obligation towards education? To the last question, Imperial responds with a conditional no. The company does not feel it has a responsibility to assist education; at least no more than any other member of the community. A Canadian company’s responsibilities are carefully stated by law, and the law makes no mention of donations to schools and universities.

It has often been said that a corporation is responsible to four groups—its employees, its shareholdes, its customers and the community (which can mean the nation). Sometimes one responsibility can collide with another. Wherever possible a company looks to spend its money in such a way as to benefit all these groups. No expense, he it for education, an oil refinery or a wage increase, is justified unless it will ultimately profit a company’s employees, shareholders, customers and the community it serves.

Asistance to education—assuming it is needed and that it is intelligently given—satisfies all four areas chiefly because free enterprise is more likely to prosper in a well-educated community than in an ignorant one. Industry is at its healthiest in an atmosphere unclouded by misinformed opinion and fuzzy thinking.

In an address to the National Conference of Canadian Universities, Dr. W. M. Compton, president of the American Council for Aid to Education, had this to say: “Education has added just as much to America’s capacity to buy and consume as it has to its capacity to produce and sell. Education, like advertising, is a means of making people dissatisfied with what they have. It adds to their incentive as well as to their capacity to make better things...if higher education were to wither, production, market and consumption eventually would wither, too.”

Some authorities put it even more strongly: “I believe,” says one industrialist, “that education has done more to create and expand markets for business than any other force in America.”

But education’s contribution to industry goes far beyond the creation of markets. Some industrialists have described their donations as being “a part of the cost of staying in business.” Imperial’s president, J. R. White has expressed the view that freedom of enterprise (which he defines as “the right to do business on economic rather than political lines”) owes its existence largely to the reasoned support it has received from the universities. An educated community, says Mr. White, stands as a bulwark against excesses of any kind. The opinions of the educated carry a weight in public opinion which is altogether disproportionate to their numbers. And he poses the question: “What would happen to freedom of enterprise if the universities were opposed to it?”

That freedom of enterprise advances hand-in-hand with freedom of education seems undeniable—but why, aside from reason of gratitude, should industry feel itself impelled to assist education? Why not leave it to government? Assuming that freedom of education is important to industry, what have corporate gifts to do with perpetuating this freedom?

The answer is that the corporate dollar is often able to do a job that a government dollar cannot do. Dollars provided directly by a government are the property of the public and must normally be distributed with this in mind—that is, on a straight basis of none-counting with little regard for the individual needs of the various institutions. This rather rigid allocation of funds might be sufficient if (a) it could take into account and evaluate individual cases with regard to the worthlessness of their needs, (b) conversely, total uniformity was desirable or possible and (c) if it were felt that higher education should be completely under the thumb of state authorities.

With regard to this last consideration, President H. J. Somers of St. Francis Xavier University, once said: “In countries where the state has attempted to dictate the teaching in the university, where it has undertaken the direction of higher education, ideas have been stifled and the universities have become mouthpieces for passing theories, and in many cases their history of hundreds of years has been betrayed. The German universities, instead of leading Germany, put up practically no resistance to Hitler.” One might be tempted to add that the Russian student, for all his achievement in technical and other fields, has been permitted to learn nothing that might prompt him to question Communism.

As a non-political entity, industry is better able to regard educational institutions as “individuals” with widely different needs that cannot be determined by a simple mathematical formula. It is for this reason that Imperial will sometimes donate more to a small university than to a large one, sometimes the reverse. In any case business gifts can perform tasks that would be impossible for a government to undo; can help a university compensate for higher local education costs; can launch universities on projects which, no matter how worthy, might not be regarded as appropriate for governmental support.

Corporate giving pays less than two percent of Canada’s education bill. However, as most industrial donations go toward higher education and higher education absorbs only 10 percent of the educational dollar, industry’s contribution to universities must be considered vital—perhaps the difference between a university operating above or below its break-even point.

Mr. White frequently underlines the strategic importance of the industrial dollar to higher education. “The corporation gift,” he says, “can be the decisive factor in determining whether or not a university is to succeed in reaching its particular goal. It is to have that margin which is necessary for passing it to the objectives which are in keeping with its own particular character and which help to distinguish it from all other universities in Canada or indeed in the world. To put it another way...”
way, corporation giving has so important a role in higher education that it can substantially deter, mine the level of academic freedom which is to be achieved.

Thus we find industry and higher education working in close partnership - each seeking to preserve the other's freedom, each fulfilling its separate obligations to the community.

In its recently published book, The University and Industry, Woods Hole challenges the equality of the partnership: "industry and the universities need each other, but industry needs the universities more than the universities need industry." The obvious implication is that while universities may depend on business firms for a portion of their capital and operating funds, industry cannot exist without university-trained personnel. In a sense, Mr. Woods Hole is probably right: industry couldn't survive without its university-educated engineers and business experts, while universities probably wouldn't be able to get along.

Mr. Woods Hole's comment - it is somewhat reminiscent of a married couple arguing over who needs whom - points up several aspects of the education-industry picture. The first is that industrial aid to education goes a step or two beyond what even its heartiest proponents ever envisioned. In his address to the 1956 National Conference of Canadian Universities, St. Francis Xavier's Monignor Somers explained, "It is only when individuals and corporations become really interested in our universities that government will do its proper part."

Here then is one of a corporation's most important functions - as a community leader, as an example-setter. Authorities agree that the crisis in Canadian education was not precipitated by any national shortage of money. Canada is a wealthy country and the Canadian economy is more than able to pay the cost of any improvement in education which has been seriously suggested, provided the Canadian people approve greater education expenditures. The average Canadian wage-earner contributes 30 cents a day toward education, considerably less than he spends on liquor and only slightly more than he spends on tobacco.

The primary problem then is one of attitude - of bringing more people to value education for its own sake, of inducing more people to substitute active interest for passive benevolence toward our schools and universities. For all the millions of dollars industry has invested in education, little will have been achieved if the Canadian public misses the point. If people continue to harbor the traditional North American mistrust of the educated man. In a way, industry today is acting as a sort of "advance man" for education. Both need an enlightened self-interest - which happens to coincide with the self-interest of all Canadians - and because it can command teams of experts in almost any field as well as large sums of money, Canadian industry has chosen to run ahead and spread the word. The hope: That "Canada's (and government's) recognition of the importance of vigorously supporting education in all its phases. The fear: That the example of corporate giving will go unheeded, that many of the Canadians who will remain indifferent to the education of their offspring.

Speaking before the Canadian Conference on Education in Ottawa in February, Dr. Claude T. Bissell, now president of the University of Toronto, declared that "the laboratory and the study are in the front line of defense and the survival of our civilization may well depend on the strength of the university. Fifteen years ago the popular idea was that the professor dwelt in a placid backwater, unaware of the facts of economic life, or indifferent to them. Now it is realized that he is in the main stream ..."

It is undoubtedly true that the successful launching of the first Russian space satellite triggered more hysteria in North American educational and pseudo-educational circles than any other event in this continent's history, if this leads to a review, a general overhaul, of our education system, then it was a good thing. If, however, it results only in increased support for one branch of education, then the cure would be the cause of another sickness.

Over-emphasis of any one segment of education in response to a temporary shortage can lead to over-production in much the same way industry might tend to over-produce a certain product if there proved more in that supply. Hence, any other short-term project will vastly by cut off by the laws of supply and demand.

Industry cannot reasonably hope for more than one thing from universities - that they produce technical people when pre-occupied and not merely trained. In other words, specialists were permitted to remain specialists. Today they tend to move out of their back offices and into the world of work, where their full intellectual capacity, and not just a little rule - is needed to make decisions.

In a recent address at the University of Western Ontario, Mr. White said, "We do not want people - from any level of education - who are more expansions of this machinery or plants they operate. We want people who can think, people who understand the philosophy, as well as the mechanics of their particular occupation." Dr. Sidney Smith, former president of the University of Toronto and now an "honorary" A.M.A. member, describes the surgeon's role as a reaction against "the smooth expert, the clinical positivist and the bantering consultant.

The problem of running a large company is far too complex today than over before. Automation, job-satisfaction, mass-marketing, and price control taxes on leases. For every man taken off the end of a chain by automation, two more must be added in the office. Despite the lower and more casual caused by the launching of the Russian Sputnik - and the consequent concern in the Western world over technical progress - good arts graduates are as badly needed as good engineering graduates.

Industry has come to some remarkable conclusions about the arts graduate's unique capacity to learn. In a recent test, a large U.S. company hired 20 engineering graduates and 20 arts graduates. The engineers took the standard plant training course while the artists took a special intensive six-month course. Both were assigned to the same type of technical job. In three years, according to the study, it was impossible to distinguish the two from the engineering graduates. In spite of their job efficiency was considered.

Out of recognition of the importance of research in the fields of liberal arts and the humanities, Imperial tries to maintain a correct balance in awarding its graduate fellowships. At present, fellowship holders are studying such subjects as human biology, the history of Canadian banking, and the social history of eighteenth century England as well as a broad range of subjects in the scientific fields. (A fellow receives $3,151 a year for three years and an additional $750 per annum if he studies in the summer months. Though he can work at any occupation in the world, he must have at least primary education.) Since 1940 the company has spent more than $375,000 on its fellowship program. One graduate has been admitted to the children's ward of hospitals, have cost $131,000 since they were initiated 11 years ago.

Short industrial fellowships and scholarships have played a part in bringing industrialists and educators closer together. Not so long ago, even industrialists relied on second-hand people as impractical, unrealistic, noisy trouble-makers. The educators, on the other hand, regarded businessmen as occupationally narrow, anti-democratic, and ethically blackened by their prominence on the powerful lists of men's own businesses. In edutainment, quite understandably, often digests with industrialists on the proper way to dominate money in education. Some have suggested that all corporate donations be pooled and apportioned to individual foundations on some nominal basis.

Last year, the University of Oxford, which owns certain artifacts, sold 100,000 for $100,000, and it has already been sold, has no special obligation to education. If industry, which grinds itself on having more of good sense at top levels, were to demand directly, without evaluating the worth of a specific project, then it would be obliterating its responsibilities to its shareholders. Without some degree of control properly exercised by the donor. On the second point - that donations become advisory society - surely this would destroy the complex interrelationships between industry and education. Educationists would come to feel that the corporate gift was their right and proper. I doubt a donor would come to regard the educational
MARG DOES A MAN-SIZE JOB

Policing an airport from a control tower was never a woman's job until Margaret Dunseith came along. Now she copes with tension that gives strong men the jitters.

by JEAN DANARD

On August 28, 1952, Margaret Rebecca Dunseith became Canada's first woman air traffic controller. Only five others have since managed to invade this male stronghold.

Marg has now survived five years as air traffic policewoman at Toronto Island airport, a small but busy field built on reclaimed harbor land, just 20 minutes by car and ferry from the city's downtown business district. She takes turns with four men clearing and landing planes and guiding the movements of any man or machine moving on the two runways and two taxi-ways running out before her glass tower. During those five years she has seen the traffic increase 50 percent until, one day early this year, the field boasted 912 landings and take-offs—an average of one every 37 seconds.

It's a lively niche that Marg found and liked after bouncing in and out of hospital dietetics, setting up soda fountains and working in radio for six years during which she did almost everything except generate the station's power.

Her present job may lack the variety of commercial radio but it's seldom dull. Flanked by radio equipment and wind instruments, she constantly scans the horizon and the tarmac. The island is a favorite landing spot for executives with their own aircraft and is the starting point for charter flights. Marg keeps careful watch too on fledgling pilots who, again and again, take off, circle the field and land. She uses a flashing light to signal planes or ground traffic without radio. Radio-equipped craft have a choice of four frequencies with which to contact her. At busy times during the day, she is reaching every few seconds for the radio microphone suspended over her desk and giving landing instructions unintelligible to laymen:

"Papa zulu (Cessna with call letters TPZ), island tower reads you loud and clear. It will be runway twenty-four (one facing southwest). Wind two three zero degrees at ten (wind is from 230 degrees and 10 miles per hour). Altimeter reading three zero one zero (pressure at sea level). Clear No. 1 to land (there's no one ahead of you)." She waits for his reply: "Roger, check landing instructions, Papa zulu." To a helicopter ready for takeoff: "Hold east, Juliet Uncle Bravo. Landing traffic."

Marg's field, bounded on three sides by water, presents a mental hazard to pilots. She therefore keeps a close eye on the Cessnas as he approaches the 3,000-foot runway. When he is safely down she radios his parking space, logs him in and starts Juliet Uncle Bravo on his way. A tape machine records everything she says and can accuse her later if she errs.

She works closely with the weatherman located on the next floor down. He delivers a report at exactly five minutes past each hour and she in turn passes on any information she gleaned from her
pilots, "Dave, Echo Papa Delta (another Cessna) says the ceiling is just 1,500." The area control center at nearby Malton, Ontario, with Canada responsible for the movement and safety of all aircraft, is as close as her telephone. She almost smiled as she communicated with Malton so that controllers at the center will take over responsibility for the craft when it goes beyond five miles of her tower. They in turn tell her what flights to expect. During finals, she checks any new rules that come from Ottawa, if Malton has them. Perhaps nibbles on her sandwich lunch and waits . . . apparently relaxed but ready to act. A check with her tower controller at the island tower feels that the uncertainty makes the job strenuous. "The difficulty is that you never know what's going to happen next. One minute all is quiet, and the next, everything is hell. We've got to be on our toes all the time."

Marg has long been reconciled to the fact that the quiet moments are only prelude to other periods when time streams by and her world shrinks to the tower and the traffic home.

Hurricane Hazel brought one of those hectic days. In October, 1954, the Canadian Press New Service reported the Toronto area with 50-mile-an-hour winds and drenched the countryside with rain for a matter of hours. The Friday night downpour turned the Humber River into a torrent that threatened the lives of some of its inhabitants. The telephone and power poles, homes with sleeping occupants collapsed in its path. Prolonged and intense, the newspaper's report noted.

At eight the next morning when Marg went on duty, a search for 81 flood victims was under way just a few miles from her tower. She plugged in her radio receiver and learned that telephone lines were down between Toronto and Malton airport, the city's major field, and traffic was at a standstill. Hundreds of streets in the city were flooded to the tops of cars. At Malton and even more were stuck in city hotels and air line offices. Air travel, downtown traffic, all in a matter of hours, was on a standstill until a shuttle could get going between Malton and the island.

Marg, the only controller on duty that day, kept up a steady pace. DCS bands, unloaded, reordered and demanded clearances continued to come in for Malton and she radiated them out. She summoned water taxis to get stranded downtown and found hotel rooms for many.

As she dashed from the telephone to the radio, she was barely conscious of pilots and anxious officials jammed into her tower. By four o'clock that after- noon she had cleared over 1,000 ma- jorized airline passengers.

Marg entered this previously all-male profession of air traffic control by a long, tortuous route. She took the first step in this direction in the fall of 1937 when she accepted a job from Frank Squires, a Toronto lawyer who had just purchased a radio telephone station CJQ in her home town of Stratford, Ont.

Marg was the only woman on the sta- tion staff. She had never been inside a radio studio before but was game to try anything. She soon was announcing and writing scripts. She drove Charlie Treh- wey, the news editor, to all major acci- dents including a plane crash that Trehwey remembers "turned her green" before the job was finished. As the men left to go to war, she had to take on additional work. One day in 1940, Squires asked her to take some letters. "But I can't take shorthand, Mr. Squires," Margaret reminded him.

"I didn't ask you if you did," he re-plied. "I just want you to take some letters."

She took the letters and learned she had also become his secretary and had to contact her own shorthand. In much the same manner, Squires also made her merchandising manager, responsible for promoting the sale of products adver- tised on the air. She often helped mer- chants set up window displays to tie in with their broadcast commercials. By 1943 she was running her own music and chatter program, "Friends and Femininity," announcing others, writing scripts, doing secretarial work and sales promotion.

Whenever recruiting officers for the women's services came to town, Marg interviewed them on the air. "They all urged me to join up, too," recalls Marg. "And I began to think I should be doing something more important. There were no boys in our family—I only had two younger sisters—and the responsi- bility for war work seemed to fall on me."

This nagging feeling grew so acute that she finally sent in an application to the air force. No woman was this in the mail than she opened a newspaper to see an ad for women air traffic control officers—"for the duration." This ap- pealed to her more. Her application was one of 40 selected out of 600.

After a blitz course in traffic control procedures, meteorology and air regula- tions, she went to the Upplands airport tower at Ottawa. She looked after the telephone. She called doctors, fire- men and police. Transport officials had to be notified. She told the telephone company their lines were down and called the electric power authorities about the live wires. When she learned both boys had been instantly killed, she phoned some of their friends. Six hours later when she had finished her other work, she went home and collapsed.

Her experience in this emergency en- titled her to the first air controller's licence granted in Canada to a woman.

Five others subsequently qualified be- fore the door was closed to women. One has retired to become a housewife; three are in towns in Montreal, Cartier- ville and Winnipeg. The 80th, in Edmon- ton, has graduated to a job in area traffic control.

Marg stayed on at Malton for another year as an assistant waiting for a con- troller's posting. In 1953, when the Department of Transport realized that traffic at the 14-year-old island airport needed a control tower, she got her present job. That year she helped log 100,000 plane landings and takeoffs. Since then she has watched them grow to 145,000. Even though the airport op- erates only during daylight hours, this figure last year represented the ninth heaviest air traffic in Canada.

Marg manages to work this activity without any qualms. "You can only land one plane at a time so there's no point in getting excited."

And she doesn't. She's as much at home in the island tower as she was a girl on her father's silver fox and daisy farm near Stratford. A tombay at heart, Marg used to ride horseback whenever she could get away from schoolwork and farm chores. Despite her love of the out- doors, she chose dietetics for a career and enrolled in the dietetic school of the Ontario Agricultural College at Guelph. Afterwards she went to a Toronto hospi- tal as a student dietitian.

The long, tedious hours shocked her. Each morning when she awoke at six, she faced a working day that would end between seven and eight in the evening, with most of that time on her feet. In spite of everything, she finished the nine- month training course, and in the midst of the depression, began looking for a job—any job. Eventually an ice cream vendor in Stratford hired her to sell up- town sodas in southwestern Ontario. Less than a year later, when Frank Squires offered her a job in radio, she snapped it up.

She adjusted easily to the pressure of radio. Deadlines taught her to work calmly in the midst of tension and she became accustomed to tackling any job. The experience didn't go amiss in air traffic control. The plane accident she helped cover lessened the shock at Leth- bridge when she faced her first crash from a control tower and had to step into the emergency with a cool head. "No one likes a crisis," says Marg, "but you do what you can and then try to forget it. I've only had the two in 15 years— at Lethbridge and Malton. I know one controller had two in a month. Both happened on a Thursday. He began to dread Thursdays and finally had to leave the service."

Marg herself has no intention of leav- ing. She likes the work and finds avia- tion interesting. "They're usually happy people. They may not like the particular job but they all love to fly."

And since female controllers are so rare, the Department of Transport per- odically checks with pilots to learn how they feel about getting landing instruc- tions from a woman. Not long as an American pilot visiting the island phrased his reaction neatly: "Well sub, there's just somethin' about hearin' a woman's voice in a tower that gets you to make the best damn landin' you ever made."

"Before starting her shift Marg always gets a complete rundown on the weather. Narrow channel divides airport from city.
ONE DAY last July a Toronto school teacher, David Moncrieff, headed for his summer cottage on Lake Bernard, near North Bay, with a firm resolve: he would put an end to one of the big disconsolates of cottage life—water-carrying.

Moncrieff picked up equipment at a local hardware store, proceeded to the cottage and within three hours had installed a complete water pipe system. Gone was the arduous task of hauling water in buckets as his pump could now deliver up to 250 gallons an hour to taps in the kitchen, bathroom and laundry.


The secret of Moncrieff’s success lay in a light, tough, flexible pipe that be installed like a garden hose from the pump across uneven ground, around trees and out into the lake. From clump connections at the side of the cottage, he ran three branches lines up through holes in the floor to the taps.

Made from an inert plastic material called polyethylene, the pipe is an end product of a petrochemical known as ethylene. Its raw material is crude oil or natural gas. Besides being easy to handle, it resists rust, corrosion, rot and extremes of temperature. If Moncrieff had used rigid metal pipe he would have required a plumber to couple the lengths and elbows. The pipe, used for most of the year, would have been subject to scale and corrosion. Costs would have been higher.

Like the labor-saving polyethylene pipes, many of the end products of Canada’s growing petrochemical industry are doing a job that now makes them almost indispensables. Today petrochemicals are the source of some 3,000 products of bewildering variety. This spring, stores across Canada began featuring summer dresses with eye-catching printed patterns. They look like cotton, but two-thirds of the material is synthetic, made from a type of chemical called polyester, which in turn comes from two petrochemicals—para-xylene and ethylene. Not only eye-catching, the fabric is strong, wrinkle-resistant and needs little ironing.

The modern woman, choosing her “chemical dress” from the store rack seldom—if ever—stops to think that it originated from crude oil. Petrochemists also helped create the nylon she wears and often provide the base for her cosmetics. She can, in fact, get a whole wardrobe made of materials that started out in hydrocarbons deep in the earth—a raincoat, a “fur” coat, sweater, blouse, erating in winter; and tetraethyl lead, which helps keep gasoline from causing engine knock. The seat covers that don’t scald, crack or tear are also made from petrochemicals.

Synthetic products, in short, have come a long way from some of the pre-war materials that were often used grudgingly as second-rate substitutes. In North America today petrochemicals are a $46 billion industry. Canada’s production, small still by any comparison with that of the United States, will undergo some notable growth with the completion this fall of a $273 million petrochemical plant which Imperial is building at Sarnia, Ont.

The Sarnia plant will be an important Canadian source for the chemicals which end up in homes and industrial plants as

Remember when “synthetic” was synonymous with “second rate”? Today it’s impossible even to count all the first-class products of petrochemistry.

by EARLE BEATTIE
supplier of fur. Chemists at Ottawa’s Defense Research Board have duplicated the light, frost-resistant fur with a nylon plastic fabric. It has a latex backing to make it windproof—but it is porous enough to allow for evaporation of body moisture. Tests show that men can live in an igloo and work in arctic weather with only a few pounds of synthetic clothing instead of the heavy, restrictive coverings usually worn by army men in the north.

Other researchers, in the Department of Northern Affairs, have developed an igloo of plastic. In an ice igloo, the temperature cannot rise above 30 degrees without melting the structure, but a plastic foam job can take much warmer temperatures.

Besides making the world a safer, healthier place to live in, the new materials have helped banish monotonous and drabness by introducing light and color. Bright pigments in the chemical manufacturing process have given us the reds, blues, greens and other attractive colors used to brighten telephones, radios, typewriters and various containers of heat-resistant polyurethane. Such squeeze bottles, from ketchup holders to hand lotion applicators, are now quite common.

Light has been shed into many a dark area largely by the use of plastic for light-hats. Many industrial plants have removed a section of old corrugated metal roofing and replaced it with a translucent plastic sheet. Others have set in entire roofs and walls of plastic that have made work more pleasant and efficient. Like the plexiglass “bubbles” of aircraft or the transparent hulls of pleasure boats, the new ceilings and panels weigh far less than glass and resist breakage.

One of the most promising outlets lies in the construction industry where plastics have passed ceramics, aluminum and zinc as a building material and moved next to copper and rubber. In Montreal’s new 21-storey Queen Elizabeth Hotel, polyethylene is serving as a moisture barrier throughout the walls. Polyethylene has also been used as an underlay for the slab floor of the new Stratford Festival theatre in Ontario.

With these developments in hand, research men are predicting an “allchemical home” by 1968, starting with partitions and going on to full walls, windows, floors, kitchens, plumbing and finally entire houses in packaged units.

This home of tomorrow will probably include a flat TV set, hanging like a picture on the wall, made possible by an alliance of petrochemicals and electronics. About six inches from front to back, the set will use the recently-developed “printed circuit” of the electronics field in which an electric circuit is created by photographing a sketch of it on copper-coated plastic. The plastic acts as an insulator except for acidized ridges that carry the current. Thin, solid and solder-free, this circuit board, along with a transistor the size of a headache tablet, will eliminate the heavy bulk of today’s TV set.

Petrochemicals are also doing spectacular things in the field of agriculture. Canada’s earliest petrochemical, ammonia, produced in Calgary during the war, has since become an important source of nitrogen fertilizer. Meanwhile, new insecticides and weed killers, many of which can be made from petrochemicals, have revolutionized farming. Sweeping down over farmers’ fields, aircraft can, in a few minutes, spray crops that once took days to cover. Agriculturalists believe that some day these chemicals will destroy whole plague of insects and eliminate the tsetse fly in Africa.

The growing importance of petrochemicals in almost every phase of daily life is emphasized by records of production since early in World War II. United States production, having doubled every five years since 1940, amounted to 38 billion pounds last year. Advantages in price, quality and abundance pushed petrochemicals to the forefront of many industries until, by 1955, they were the source of one-quarter of all textiles and more than half of all rubber products. Meanwhile, synthetic detergents, also made from petrochemicals, captured two-thirds of the market formerly held by soaps (which are made from animal fats and vegetable oils).

Canada’s first big petrochemical plant was that of the government-owned Polymer Corporation in Sarnia. It was built in 1943 to supply synthetic rubber for wartime use after the Japanese cut off the Allies’ supplies of natural rubber. Its raw material was and still is supplied by nearby refineries. Not until the early 1950s, however, did the petrochemical industry begin to move ahead in this country; by 1955 Canadian plants were producing 700 million pounds of petrochemicals a year. Canada’s total cumulative investment in plants has amounted to some $325 million since the industry’s beginnings in 1940. Another fifty to sixty million dollars of plant investment is planned or under construction this year—an amount almost equal to the entire wartime investment in petrochemical plants.

Despite this rapid growth, centered chiefly at Sarnia, Montreal and Edmonton, Canadians have lagged far behind their U.S. neighbors. They produce about one-quarter as much per person—a fact which Imperial had in mind when it formed a chemical products department in 1955.

Within two years manager Clayton Beamer and his department had their first plant in operation—a $5,500,000 unit at Sarnia to make detergent alkylate, the basic ingredient of synthetic detergents. Now with a productive capacity of 30 million pounds a year the plant makes Canada self-sufficient in this petrochemical, formerly imported.

Even more significant is Imperial’s new petrochemical plant scheduled to go on stream at Sarnia this fall. Company engineers casually refer to it as “the new cracker,” but the plant is actually the first of its type in Canada. Consisting of four plants on one site, it will turn out a wide variety of petrochemical raw materials, including ethylene, propylene, butylenes, butadiene and aromatic distillates and tars.

The ethylene plant will be the largest of its kind in Canada. The butadiene unit, first in Canada to be owned by a private company, will feed this chemical raw material to the Polymer Corporation for making synthetic rubber.

Chemical companies at Sarnia and elsewhere will in turn process these materials, and their “intermediate” products will in turn be used by other manufacturers to make hundreds of products. Many of the petrochemicals and finished articles, now imported, will be made in Canada for the first time. Some will likely find export markets.

The housewife buying synthetic curtains that don’t need weights to hold them down after washing or the man rolling rubber-based paint on his living room wall would hardly recognize their origin in Imperial’s new plant. The “Spaghetti Bowl” of cross-cutting pipes and tall, lean towers will draw their feed stock—some 350,000 gallons a day—from the refinery streams.

Heated to more than 1,800 degrees in a gas-fired furnace, the oil’s hydrocar-
We've grown somewhat used to letters from Review readers in distant places, since one of our friendliest readers, who often drops us a line to comment on something we've published, happens to live in Bombay.

But when the prison librarian at San Quentin, Calif., wrote in recently to ask us to put his institution on our mailing list, we began to get curious about the location of some of our other more distant readers.

Already well aware that the great majority of our readers are in Canada — from Victoria to Val d'Or and from Pouce Couche to Prince Edward Island — and that our U.S. readership, though much smaller, is spread across the continent in several dozen states, we concentrated on our non-North American readers.

One look at the list was enough to turn up names in Antwerp and Aruba, Bogota and Buenos Aires, Caracas and Casablanca, Haifa, The Hague, Hamburg and Helsinki... and by the time we got down to the Moscow State Library we'd seen enough to prove a point.

We have a strong suspicion that we're not alone in our curiosity, for one of the first things a Review reader usually asks us whenever we meet one personally is: "Who else gets the magazine?"

We've never yet worked out a really pat answer to that, for our readership probably encompasses as broad a segment of the Canadian public as any other national magazine. Our readers in Canada include more than 2,000 press, radio and TV people; nearly 7,000 educators (from grade one teachers to university presidents); and more than 1,200 law makers and administrators, from village clerks to federal cabinet ministers. Doctors, lawyers, engineers and other professionals are also on our mailing list, along with large numbers of farmers, wage-earners and salaried people of moderate income. Many of these, of course, are also Imperial shareholders or are numbered among the company's 15,400 employees and annuitants.

Our readership seems likely to grow broader and larger than ever, as a result of the overwhelming response to our British Chemical plant in Sheffield issue in April. A great many who wrote in for copies of that issue also asked to be put on our permanent mailing list, and we've been glad to oblige.

We'd expected that the April issue would prompt more than the usual number of special requests from B.C. residents, but we were flabbergasted by the response from people in the other nine provinces.

And we hasten to add that only a tiny fraction of these requests from east of the Rockies were from exiled British Columbians who wished they could be home for the centennial celebrations. Most requests, in fact, came from school teachers and others who told us the April issue contained a lot of interesting and useful information about a province they'd never seen.
Hants County’s Homespun Fair

Now is the time when the voice of the calliope is heard in the land. All over North America, in the next few weeks, more than 40 million people will click through the turnstiles at some 2,000 fair fairs to gaze upon the latest products of farm and factory, to take in gaudy midway sights, show off prize Holsteins or hooked rugs and taste the wispy pleasure of pink cotton candy.

The Canadian National Exhibition at Toronto may be the greatest, if size counts for much, but the lively little Hants County Exhibition in Windsor, N.S., ranks as the granddaddy of them all. Founded in 1765, more than a century before Confederation, it’s still going strong despite several lapses, still packing in four-day crowds of 20,000 or more and still serving as the show window of one of this country’s oldest and lustiest agricultural areas.

For the farm folk who work the dikes, lands around Windsor, a normally treeless little river port of 3,000 people on the edge of the green Annapolis Valley, the Hants exhibition is a social and occupational highlight of the year. “When it’s fair time,” says agricultural representative Don McKay, “the whole county busts loose and comes to town.”

They come in from outlying places like Henning’s, Upper Falmouth, South Rawdon, East Noed, West Gore, New- port Corner, Walton and Wentworth Creek. There’s Hurley Kilcup, from Three Mile Plains, with his Herefords; Freeman Lepold and his prize ox team from New Ross; and Howard Smiley, who’s been showing horses and cattle in Windsor for more than 60 years. There’s Mrs. Mary Gill, who brings goats from Avondale; Bill Taylor and his son Leon, from Martock, both champion walking plowmen; and Merrill Schofield’s boys from Gaspereaux, who take part in the $100 tug-of-war. There are men with neat sheafs of grain to put on display for the judges and jugs of apple-jack for the old friends they’ll be meeting; women carrying pies, golden loaves of bread and needlepoint to enter in Household Arts; and children bringing bogs, white mice and a dozen other kinds of animals for the big Pet Parade on 4-H Day.

Many other fall fairs may be strong for industrial exhibits and carnival tents, which bring in money. Not Hants County’s. “This is the most farm-minded fair in the business,” claims Watson.

Since it was founded in 1765, the annual exhibition at Windsor, Nova Scotia, has shunned sideshows and eschewed circuses to give its farm folks what they really want—a good old-fashioned fall fair.

Story by Don Davidson
Photos by Roy Nicholls
Maxner, the stocky, grey-haired secretary-treasurer of the sponsoring Windsor Agricultural Society, "We haven't become a sideshow yet. Never will, either."

Accordingly, the Hants fair has a distinctly rural flavor. It features big displays of farm machinery and livestock, usually about 400 cattle and more than 100 horses, as well as sheep and swine. Prize totals $5,000. There are always scores of entries in the competitions for field crops, garden vegetables, fruit, flowers, poultry and home handicrafts. Revenue-producing industrial exhibits are confined to one building, and the midway is relegated to the rear of the 42-acre park.

Until 1951 the Windsor fair was always held on the grounds at Fort Edward, the historic blockhouse where the expulsion of the Acadians was planned in 1755. When the site was turned into a golf course the Agricultural Society bought an abandoned army camp and buildings, including a 3,000-seat arena, for $125,000.

Today the society's show sometimes attracts larger crowds than even the Nova Scotia Provincial Exhibition at Truro. At 50 cents a head for admission — kids free on opening day — it usually grosses about $17,000 and turns a profit of about $2,000.

One reason for its success is that folks with a day or a dollar to spend never lack for something to do at the fair. Besides all the exhibits to see, there are plowing contests, ox-and-tractor pulls, tugs-of-war that can whip 3,000 people into breathless excitement, and a horse show that sends many winners to Toronto's Royal Winter Fair and is generally considered the best in Nova Scotia. Each night there are amateur contests featuring gaily costumed folk dancers, sword dancers, pipers, singers, old-time fiddlers, musical saw virtuosos and guitar players ranging in age from five to 70. It is, in short, a pretty interesting place to be, filled with arresting sights and sounds. As the Hants Journal once reported: "The strains of old-fashioned revival hymns from the loud-speaker at the Bible booth, mingling with the hot tuns from the midway, afforded a study in contrasts."

While the agricultural society occasionally hires one or two professional acts — like Frank Cook, "High-Wire Comedian Fresh from a Triumphal Tour of the Dominican Republic" — it prefers to keep most of the entertainment wholesomely home-grown. When some of the townspople of Windsor advocated jazzing up the fair with more carnival attractions, a few years ago, the farmers who run it promptly turned thumbs down. As they pointed out, the exhibition wasn't created for Windsor. In historical fact, it was the other way around.

The ancient Acadian settlement of Piqueqaq was actually incorporated into a township called Windsor, in 1764, in order that a system of weekly public markets and twice-yearly fairs could be established. Its main street was just a rutty wagon track when the first fair was held on May 21, 1765, and about a hundred farmers and their families trekked in to show off their livestock, produce and homespun. The prizes, put up by a group of wealthy citizens of Halifax, included three yards of broadcloth and a medal for the person showing "the greatest number of Neat Cattle." A saddle, a bride, a pair of shackles, a butter churn, a whip and six yards of ribbon. The best wrestler was offered a lace hat and a pair of spurs.

The moving spirit behind the fair was a member of Nova Scotia's legislative council, the Hon. Michael Franklin, an enterprising immigrant who'd acquired a fortune by operating a grog shop on the Halifax waterfront. (Among his enterprising policies was the serving of free rum to all patrons who came in before breakfast.) Franklin was an ardent horseman and it wasn't long before an

Secretary-treasurer Watson Maxner (left) terms it a most "farm-minded" fair

Earle Murphy (center) is in charge of gates throughout the four-day exhibition

Registration of all entries at exhibition is inspected by Gay Lapruck (right)
Management Changes

Harold L. Magee retired July 1 as assistant general manager of the marketing department after a successful and colorful career dating back to 1920.

Born and educated in Belfast, Mr. Magee joined Imperial's marketing department at Edmonton, Alberta, and within the short period of five years was Imperial's leading automotive oil salesman for Canada. He was named assistant manager of Regina marketing division in 1927, and manager of the division in 1932. Two years later he moved to Toronto as supervisor of western divisions and in 1935 was made supervisor of retail sales for all Canada.

In 1936 he became sales manager of Quebec division and in 1938 returned to Toronto as manager of the newly organized Ontario marketing division.

At the end of the war Mr. Magee was promoted to regional manager of eastern marketing divisions and in 1950, general sales manager for Canada. Two years ago, he became an assistant general manager of marketing.

An ardent golfer, Mr. Magee has one son—Jerry Magee, a professional golfer—and two daughters.

Mr. Magee's successor, Ronald S. Ritchie, became prominent as a business leader and public speaker in just more than three years in Vancouver as manager of Imperial's B.C. marketing division. He was a director of the B.C. Chamber of Commerce and active in the Vancouver Board of Trade and the Community Chest.

He is a graduate in political economy from the University of Western Ontario. He joined Imperial at Toronto in 1947 and worked in the co-ordination and economics department before being appointed assistant manager of that department.

In 1953 he became assistant manager of the Ontario marketing division and two years later was transferred to the B.C. post.

In 1954, when he was chairman of the Toronto branch of the Institute of International Affairs, he went to Pakistan as a delegate to the Commonwealth Relations Conference. Two years later he completed a book entitled: NATO, The Economics of an Alliance.

New manager of the B.C. marketing division is Howard W. Coxon, formerly in Toronto as operations manager of the marketing department. Born in Mexico, Mr. Coxon studied economics and English literature at Cambridge. He served with British army intelligence and the RAF during the war. He joined Imperial late in 1949 and spent three years in Regina in the co-ordination and economics department. He then became assistant manager of the Ontario marketing division and was appointed operations manager in 1956.

Mr. Coxon's successor is Harvey B. McGonigal, a Saskatchewan-born RCAF veteran. Mr. McGonigal joined the marketing department in 1938 at Regina as a pricing clerk. After the war he returned to Imperial as district supervisor at Prince Albert. In 1954 he was appointed budget co-ordinator, and later, co-ordinator of retail development—the position he held until he succeeded Mr. Coxon as operations manager.
The well-mannered young men in the souped-up sedans

Around 11 o’clock one night last summer, 24-year-old Harry Knysh, a clerk in Winnipeg city hall, was driving home over the rain-soaked Henderson highway eight miles north of Winnipeg. Suddenly a beckoning man and a stalled 1956 Ford bounced in his headlights. Knysh pulled over.

“Motor died all of a sudden,” explained the stranger, a middle-aged businessman. “I’ve been here nearly an hour. You’re the first one that’s stopped.”

“Let’s look under the hood,” said Knysh. The motorist eyed Knysh’s blue jacket with the “Clutchers’ Rod and Custom Club” emblem. He’d heard about these crazy hot rod kids. Still, this polite young man seemed to know what he was doing. With growing respect the motorist watched Knysh run hands and eyes over the engine.

“Your distributor cap’s broken,” Knysh said almost immediately. “Probably happened when you splashed through a puddle. Cold water will crack a hot cap.”

“No pay, thanks,” said Knysh. “But I’d appreciate it if you’d take this.” And as Knysh drove away the flabbergasted businessman stared at a small pink card:

YOU HAVE BEEN ASSISTED BY A MEMBER OF THE WINNIPEG CLUTCHERS’ ROD AND CUSTOM CLUB. A “HOT ROD” ORGANIZATION FORMED BY A GROUP OF RESPONSIBLE AUTO-ENTHUSIASTS DEDICATED TO PROMOTE INTEREST IN THE SPORT WHEREVER IT MAY BE FOUND AND WHO HOPE TO UNVEIL TO THE PUBLIC THE TRUE MEANING OF THE TERM “HOT ROD.”

Two days later the motorist’s thank-you letter was read over Winnipeg radio station CJOB. With more and more fellow-drivers he’d learned that the Canadian hot rodder is not necessarily — or even generally — a teen-ager running wild in a beat-up jalopy.

There are such irresponsible “rodders” but they are shunned by Canada’s several dozen hot rod clubs. Organized hot rodders look down on reckless drivers as “gooks,” “squirrels” or “yo-yos.” The true rodder helps other motorists (although rarely carries as many spare parts as the enthusiastic Harry Knysh), devotes his spare time to building a super-safe, super-efficient car and, if possible, races the car on well-regulated drag strips (so named because each driver keeps his car in each forward gear as long as possible to “drag” the maximum number of revolutions per minute out of the engine before changing to the next highest gear). For all these activities the rodder has won approval from many traffic officials.

“Where there is organized activity among hot rod enthusiasts there is no problem,” says Vancouver’s police traffic superintendent R. M. Booth. “On the other hand, those young drivers who display bad driving attitudes and give cause for complaints do not associate with bona fide clubs.”

Since the innovation of hot rod clubs no member has appeared in our traffic court for any violation,” reports Calgary

Traffic inspector J. C. Stagg.

In Regina, police chief Arthur G. Cockson says of the local Road Knights, “I have yet to receive a complaint against the club or any of its members. In all its activities it holds fast to its watchdog of safety.”

And in Winnipeg, where a police detective has belonged to the local Clutchers, Chief Constable Robert Taft says, “Our experience with hot rodders has been a happy one. They’re leaning over backward to live down an undeserved reputation.”

As Taft indicates, it is the private citizen who most often regards all hot rodders as highway menaces. So, indeed, did I until I set out to ask: who and where are Canadian hot rodders and what do they do?

“Where” is the most difficult question because rodders have no Canadian parent organization. There are 28 clubs in the B.C. Custom Car Association, six in the Calgary Timesing Association, five in Winnipeg and others in Edmonton, Regina, Brandon, Kenora, Toronto, Belleville, Kingston, southwestern Ontario and, probably, many other cities and towns.

Some are affiliated with the National Hot Rod Association in California, parent body for most U.S. rodders. The NHRA sets down safety rules, organiza- 

## Putting safety first.

Canada’s organized hot rodders have nothing but angry contempt for the irresponsible “gooks” who run wild on wheels

by Robert Collins

Winnipeg hot rodders change a tire for a helpless and appreciative woman driver

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Some are affiliated with the National Hot Rod Association in California, parent body for most U.S. rodders. The NHRA sets down safety rules, organizational procedures and the best definition of a hot rodder: “… an experimentalist. He is perpetually dissatisfied with the status quo. He seeks and gets improvement… When he creates something he wants to see how it works. The product is usually speed… Speed in itself is not evil. Organized speed events conducted under safe supervised auspices provide the answer.”

“As ‘experimentalists,’ hot rodders are forever stripping extraneous chrome from their cars to make sleek “custom” models, or stripping down fenders to build true racing style “rods.” The blotchy vehicles we sometimes see in cities are often hot rods mid-way through a face-lifting job; probably the owner has run out of money for paint.

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Numerous occupations are represented in Winnipeg hot rod club

1950 Ford, or John Cable of the King- nelson Peaceful Pacers tinker with “our pride and joy, a 1933 Ford roadster with a 1953 Chrysler engine, dual 4-barrel carburetors, a three-speed rear axle even dual exhausts. The body has been lowered and altered. It has a wrap-around windshield, wire-spoke bumpers, new tires and a baby-blue paint job. This car is as safe as safer than any on the road.”

The safety factor is no coincidence. Every well-organized club insists on safety checks for members helping rodders every three or four months—more than the average motorist has. Each Winnipeg Clutchers, for example, must score at least 75 percent on a 36-point safety checklist, ranging from license plate light (two points) to safe brakes and steering (25 points each) and well-treaded tires (30 points).

When a car enters a drag strip race it undergoes an even more rigorous safety check, and hub caps are removed for fear they may fly off into a windshield.

“Drag strip racing is the safest kind there is,” claims Ernest Barrie O’Neill, the 3-year-old president of the Clutchers. “The only thing that can happen is a blowout and that shouldn’t happen because tires are checked.”

Yet drag strip racing is the most controversial point in the entire controversy subject of rodding. In Edmontion, although police chief M. E. Anthony sees “considerable advantage in organizing clubs under proper control,” his department will not support the operation of drag strips. “It encourages speeding and other forms of reckless driving. The drivers are not then operating under usual traffic conditions, which could well give them a false sense of security.”

In Winnipeg, although the motor vehicles branch gives rodders safety lectures, films and co-operation, assistant director of traffic safety Peter Daga Fears that “dragging creates wrong attitudes toward speed. Hot rodders may forget that you can’t drive on a highway as you do on a drag strip.”

But Les Higgins of the branch’s driver testing division disagrees. “Some boys will have wrong attitudes anyway,” Higgins says, “and since they will drive, and perhaps speed, let’s have them do it where they can be controlled.”

Calgary police are enthusiastic supporters of rodding and drag racing on an old air force runway near the city. A police officer periodically attends club meetings to show safety films or lecture on traffic laws. Two policemen are among the drag racing judges.

But Calgary and Abbotsford, B.C.— where the drag strip is being reclaimed for an airport, and B.C. businessmen who drag strip— are the exceptions. Although many have police approval, few other clubs have a drag strip or hopes of getting one. In Belleville, Glen Crawford of the Road Riders says, “We are trying to make our community proud of us but people are very slow in offering help or encouragement.”

In Winnipeg the now-defunct Manitou Auto Cycle Racing Association—which included hot rod, motocycle, sport car and motor boat clubs—had plans and promised-funds for a race track and grandstand, but the project has been shelved.

When political authorities and the Junior Chamber of Commerce purchased and donated to Vancouver police a drag strips in a residential area, the vehicles were seized and two others were unloaded.

Before the meeting broke up, a second film on trucking made the point that very few truckers are in any way connected with the sport of rodding.
by JIM MOORE

When the channel steamer *Divia* docked at London on the morning of September 30, 1913, shipping officials found themselves facing one of the strangest mysteries in the history of channel navigation. A passenger—the famed German inventor Rudolf Diesel—had disappeared from the ship, and with him many valuable papers.

In the 45 years since his disappearance the theories seriously advanced about his fate have covered almost every conceivable possibility. Accidental drowning could never be ruled out completely, and yet there were motives for murder and for suicide. On the other hand, it was never proven beyond doubt that Diesel died at that time; one newspaper report said he left the ship in disguise and went to Canada to work as a ranch hand.

Regardless of how he met his end, Diesel's work lives on today as probably the greatest contribution to engineering and industry since that of James Watt.

His legacy—the diesel engine—is the most efficient internal combustion engine ever built. The full significance of his invention was not realized at the time of his death, but today Diesel would find the world has paid him the supreme tribute—by making his name a part of the language. In highway, rail, and boat transportation, in construction, agriculture, the generation of electricity, mining, oil and gas drilling, and the hundreds of other activities that are extending civilization and raising living standards, diesel engines—ranging in weight from 300 to two million pounds—move in the very forefront.

The fate of his engine contrasted greatly with the tragic, harassed life and the mysterious death of the man himself. Afflicted by exasperating headaches, challenged by his colleagues at every turn, and sensitive to the opposition and abuse he faced, Diesel proved that in spite of all obstacles he was the exemplar of what he believed an inventor should be.

"The inventor," he once said, "must be an optimist, since the full driving power of an idea is to be found only in the mind of the originator. He alone has the sacred fire to push it through."

That Diesel possessed this "sacred fire" was certainly evident even in his youth. Born and raised in Paris of German parents and educated for a time in London and later in Germany, he was fluorescent tri-lingual. At the engineering school he attended in Augsburg, Germany, he graduated at the age of 12—the youngest in the class—with the highest scholastic record in the history of the school.

At the same time he was a person of such sensitivity as to make his life almost unbearable. (Diesel, who thought of himself as a Frenchman, wrote in later years that his expulsion from France, with all other Germans, at the outbreak of the Franco-Prussian War left his mind permanently scarred with the humiliation of being a refugee.) In his youth his sensitivity drove him within himself and he became deeply absorbed in engineering studies. As a result, he won a scholarship to attend the Munich Polytechnic School.

At that time the most famous member of the faculty at Munich was Professor Carl von Linde, the engineer who first succeeded in liquefying air and who discovered many of the refrigeration principles employed today. By Diesel's own account, a statement by von Linde gave birth to the idea that determined the young student's life work.

"Gentlemen," von Linde told his students at the end of a lecture, "we must conclude that, considering the great amount of fuel required, existing prime movers produce relatively small power." At that moment 21-year-old Diesel made up his mind to design a more efficient engine.

After graduation he went to Paris for von Linde, where he built and supervised a plant to produce freezing machinery. There, for a decade, he drove himself almost to the limit of his endurance. At that time he began to suffer acute headaches which left foremen of a much more serious affliction. Diesel fought off the pain and worked on, learning more about compressors and their problems than he could have learned anywhere else.

While he continued to work for von Linde, Diesel devoted his own spare time to designing a new kind of engine. The internal combustion engine that was then moving to the fore in Germany appears to have been the basis of the new principles being formed in Diesel's mind. At last, in 1892, two years after he left Paris to handle von Linde's business in northern Germany, Diesel's first blueprints were complete, and he applied for a patent. From the German Patent Office came patent No. 67207—for "Working Processes for Internal Combustion Engine." Although the office had received many applications for such patents, the officials decided that Diesel's idea was brand new.

Actually, it was both old and new. From the internal combustion engines then coming into prominence in Germany, he borrowed the idea of turning the heat of fuel into useful work within a cylinder. But here the similarity ended. Instead of having a spark explode compressed gases in the cylinder, Diesel employed a principle he had learned in his years of research: if air is compressed sufficiently, it will reach a temperature high enough to ignite fuel. Diesel found that at 500 pounds pressure per square inch, the compressed air would reach a temperature of 1,000 degrees Fahrenheit. By devising a way of igniting fuel without a spark, Diesel did away with any need for a carburetor, which mixes gasoline and air into a vapor before it is
jected into the cylinder. It was an im-
portant simplification because even in
today's automobile engine the carbure-
tor remains one of the most finicky
parts. More important, his engine was
designed to operate at a compression ratio
more than double that of the gaso-
line engine. (This was possible because
the intensity of the explosion in a diesel
engine can be controlled by varying the
amount of fuel injected; whereas in the
gasoline engine the ratio of air to gaso-
line remains constant, and there can be
no variation in the intensity of the ex-
plosion, but only in the number of
explosions per second.) Thus, by finding
a way of making a greater proportion of
the heat in the cylinder do useful work,
Diesel had done what he set out to do: he
had designed a more efficient engine
than any then in existence.
But the diesel engine was still nothing
but a set of blueprints, and Diesel's first
efforts to get it built at the Augsburg
Machine Works met with skepticism.
Accordingly, Diesel set out to prove
his point, and in 1895 published the historic
"Theory and Construction of a Rational
Heat Engine to Replace Steam and the
Existing Internal Combustion Engine."
This book did the trick. With the Augs-
burg officials and the giant Krupp cor-
poration sharing the risk, Diesel got the
money to go ahead on construction.
Within the year the prototype of Diesel's
engine was ready for its first test.
On August 13, 1893, Diesel stepped
up to the machine and pulled a lever.
The engine blew up, knocking him un-
conscious. As he convalesced in hospital
his optimism returned. His notes, in
fact, show that the explosion itself was
a relief from the boredom of the present.
"I knew then just what I wanted to
know," he wrote. "It was proven pos-
sible to compress petrol sufficiently that
the fuel injected into it ignited."
Modifications followed. An improved
fuel pump was added, along with stronger
cylinders and more accurately regulated
valves. Because so few engineers could grasp the signifi-
cance of Diesel's complex efficiency
curves, tables, charts and formulas, he
did most of the work himself; and super-
vised the rebuilding of the engine. At
last, at Augsburg, in 1897, he unveiled his
work. It ran smoothly and perfectly.
Soon businessmen and engi-
neers were coming from all parts of the
world to inspect it. Their enthusiasm was almost
boundless as they quickly realized that with the
heat generated from compression, a
heavy oil—cheaper than gasoline—
could be used to fuel the engine. Its
economies were highly attractive.
Attractive, too, were the offers made
to Diesel. The Krupp and Augsburg
companies had paid the equivalent of
$7,500 for his construction of the engine.
But in 1889, only a year after the com-
pletion of the first fully successful engine, the American
car manufacturers, Adolphus Busch, paid Diesel $250,000 for
the American and British patents. Despite his newly won wealth, Diesel
had more problems than ever. Inventors,
in several countries, notably in Europe,
tried to infringe on his patents, while others
cried that the engine was unsafe and uneconomic.
In the factories, workers agitated against it, fearing its
greater efficiency would cost some of
them their jobs.
To defend himself and his engine
against these attacks, Diesel travelled
to many parts of the industrialized world,
making speeches, writing articles and
warding off threats of litigation. To
some extent these trips were successful,
but with his dignified bearing (which
seemed pompous to many) and the
pince-nez through which he peered at
the world (disappointingly, some thought)
he never cut a popular figure anywhere.
Moreover, unlike most of the great
inventors of his time, Diesel was not
a workshop engineer. He did not inven-
try, rule-of-thumb or trial and error. His
pride was a "paper inventor" be-
cause every step he took was prefixed by
meticulous mathematical analysis. He
was, in short, an early-day "egg
head."
Finally the strain of the struggle was
too much for him. That very year, when
he was just 40, he suffered a nervous breakdown.
Comforted by his wife Martha, he
gradually recovered enough to resume
work, but his trips became less frequent,
his experiments fewer and his defense
of his engine less impassioned. He was
never quite the same again. His head-
aches began returning with greater fre-
quency and violence, and he was soon
able to do little else but manage his
personal investments and watch the pro-
gress of the machine that bore his name.
Then his investments failed. He lost
a million marks—about $250,000—in
his speculations and another fortune in
to stocks. By 1913 he was all but penniless.
In that year, however, he saw a glim-
smer of hope. The British govern-
ment invited him over to talk to a group of
manufacturers about using his engine in
submarines.
He left his home in Augsburg, Ger-
many, and on the night of September 29
boarded the channel steamer Dresden at
Dover to cross to Ostend. With him he carried
the technical papers he was to show to
the British manufacturers.
Apparently he was elated over his
prospects in Britain, for those who saw
him begin the trip said later that he
looked well and acted as though he felt
better then than at any other time in
recent years. Once aboard, he said good-
night to his two travelling companions,
went into his cabin and shut the door.
He was never seen again.
When the Dresden docked at London
the next morning, his cabin was empty
and his bed had not been slept in. There
was no evidence of foul play, but neither
was there a sign of the highly important
papers he was carrying to London.
Every part of the ship was searched
and passengers and crew were questioned
closely, but to no avail. For weeks after
that his fate was a popular subject of
speculation in the press. Gradually news of
the impending war in Europe pushed the
tragedy of Rudolf Diesel out of the news columns.
In 1917, curiosity was revived in
Britain by a captured crewman from a
German submarine. The German swore
that Diesel had been pushed overboard
because he was "not nearly so important for
Germany's submarines that would have
been of service to the British. The sailor
pointed out that only a few weeks after
Diesel's disappearance, a body had been
recovered from the Scheldt Estuary. Such
a body had been found, and had in
fact been identified as Diesel's, but the
identification had been based only on
the size of the body and the press on it
of a pair of gold-rimmed glasses.
Later the public learned of Diesel's
finances and misfortunes, and one of his sons,
Eugen, revealed that on occasion his
father had discussed suicide with him.
Unsure of his father's mind, Eugen
was considering it for himself, Eugen
had even suggested jumping from a ship as
the best method. But if Diesel did com-
mit suicide, did he have any reason to
take his valuable papers with him?
Because all the evidence is circums-
stantial, we will probably never know
how Rudolf Diesel died. We do know,
however, that he made no contribution to industry and transporta-
tion. Within a few brief years of his death, the Diesel engine
by his machine—the engine that, in
one way or another, may have been re-
sponsible for ending the life of its inventor—
Among more than a thousand celebra-
tions to be held this year in all parts
of British Columbia to mark the province's
100th birthday, one ceremony this month,
at the small but venerable town of Kaslo,
on Kootenay Lake, will be unique. There
the Kootenay Lake Historical Society is
dedicating a museum the still-floating,
60-year-old steamboat, the Moyie—last
of B.C.'s old sternwheelers.
Placing the boat on a cement founda-
tion, overlooking the lake where she
charmed a distance of about 2 miles
per hour, the boat itself cost to build
plus about $2,400 worth of volunteer
labor in the form of painting and renova-
tion, on the part of residents.
The willingness of Kootenayans to
dedicate their time and money as if they
were building a church, is indicative of
affection for the Moyie in particular and
sternwheelers in general. For many
years the chugging paddlewheel steamer
was the only link that prospectors,
inners and homesteaders of the B.C.
interior had with the outside world; only
the gradual building of roads and rail-
ways finally made the operation un-
profitable.
Tourists can still enjoy the unmatched
beauty of British Columbia's larger lakes
from the vantage point of ferries which
carry the unhurried and their automobiles
across or along the length of the
Kootenay and the Upper and Lower
Arrow lakes. But these boats have
diesel engines which drive conven-
tional propellers. The sternwheeler is
gone, and with her a last reminder of
the brave beginnings of the province, Only
the Moyie remains—and she in a sterile
setting which would moisten the eyes
of any who are hungry for something as
an essential part of their daily lives.
Her whistle—described by one old-
timer as "something between the growl
of a bear and the boot of a great horned
owl, sometimes trailing off into the wall
of a banzai"—was first heard in 1898,
the heyday of sternwheelers. Since then,
they have been carrying mail and timber,
food and coal, kerosene and buck saws
for more than 30 years. They were built
with an unbelievably shallow draft, so
little as 16 inches when loaded, which
enabled them to navigate the most
unlikelihood-looking lakes and rivers. Of
the 26-ton steamer The Gem, launched in
1874, the Victoria Colonist reported she
had a "draft so light that she can run in
a heavy dew."
The sternwheeler usually had four
huge rudders placed close to the thrust of
its powerful wheel. These made it
highly manoeuvrable and easily con-
trolled, a necessity in the cramped and
narrow channels. Survivors of the Klondike
stampede of 1897-98 remember the cap-

9.3 MOVIE
B.C.'s Beloved Old Sternwheelers

For ninety years these lake boats on the interior waters of British Columbia had a special place in the hearts of all who knew them. Now the little town of Kaslo is bidding a reluctant goodbye to the last of them by FERGUS CRONIN

Imperial Oil Review, August 1958

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was at Cooper Creek Rapids, which are about a mile in length and all white water. A steel cable was made fast to a large fir tree on the river bank some distance above the rapids, the other end attached to a log which acted as a float. When the steamer reached this float it was picked up and attached to the steam capstan which wound in the cable, the extra pull allowing the boat to climb up over the rapids into slower water. The cable was again attached to the float which was thrown over and floated downstream where it remained bobbing about in the rapids until the next trip upstream...

The captain was but one of many of these devices used by fearless men to defeat the raw elements; the greatest was probably the device by which Captains E. P. Armstrong, who has been called East Kootenay's "father of navigation", described how he negotiated Jennings Canyon on the Kootenay River 60 years ago:

The current forms an elbow 70 feet wide on the narrows point. About 600 feet below were two big rocks, some 600 feet wide. The water followed the left bank, but left up against it, as if a large vessel were up. At that point the current was going in a straight line. The skipper made his slate off the right side and went onto the rocks that lay opposite, the current being too strong for him to go down stream. The current was so strong that it swept away from the right bank, and by "docking speed" while still heading for the rocks, the current would take in the boat and stream it smooth water.

The captain came to grief himself in the canyon but only, because another boat ahead of him piled onto the rocks and closed the channel, allowing Armstrong no alternative but to crash into it. The captain, as he was at Longbeach Wharf in Kaslo, gives an impression of luxury and comfort, with its 161-foot length, its cozy-looking cabins and fine-carpeted dining room where white-jacketed waiters often had to help travelers after the vice of some of the confusing array of real silverware to use. But few of the boats were so sleek. One old man in the "Sudden Jerk" had the nickname of "Sudden Jerk." She was powered by an old threshing-machine engine which had traveled and stopped abruptly when ever she blew her whistle, due to sudden loss of steam pressure. Prospective passengers would be waiting on the deck, and the old man would sight a bigger engine often had to sleep on the open decks in their own blankets, cook their own meals over the open fires on a coal stove, and at regular intervals get out and chop or load wood for the voracious engines.

In their heyday, sternwheelers were the center of many Kootenay social events.
Nat’s opening was announced thus: “Tuesday was a day of excitement and bustle in town and every inhabitant who could either be called on the bluff overlooking the river or at the bridge to welcome the Gwenedale, the first steamer of the season. Gail she came up the river decked with flags floating in the bright sunshine, and as she neared the town she was fittingly received by a voluntary salute of 21 guns.” Another first-of-the-season arrival was greeted by “a salute of dynamite sticks.”

The big operator of steamers was the CPR which in 1898 bought out the Columbia & Kootenay Steam Navigation Co. and acquired seven steamers, 10 barges and other equipment, and later built several more. Some of the barges had three decks and carried 15 fully loaded railway cars each. The boats made a big profit for the company before the 1930s by transporting fruit and mineral ore from out-of-the-way places to railheads. By the ’40s, however, passenger service had dropped to one or two trips a week on the Arrow, Kootenay and Okanagan lakes and had disappeared altogether on Okanagan Lake. And by the ’50s, the service was no longer profitable. Magnificent send-offs were given the Moyie during her last trip in April, 1957, and also to her sister ship, the Minto, ignominiously scrapped after her last voyage in 1954. The Moyie’s last trip was the 80-mile run from Proctor, on Kootenay Lake, north to Luscar and return. Hundreds lined the shore to take one last look at the old veteran in action. But with the knowledge that she would be preserved for posterity, there was not the same sadness about this last run as when the Minto was bound for the scrap heap, hooted her horn, and gave her last blast.

The Minto’s last voyage covered the 134-mile length of the Arrow Lakes and ended at Nakusp, where her fires were allowed to die in the huge paddy where the wheel finally came to rest. As the boat, crowded with nostalgic friends, slowly passed the little community of Piche-moore, Jack Forbes, dressed in kilts, paced back and forth on the sandy beach playing a lament on the pipes, his route flanked at either end by two Scots at attention. At Broadwater the ship’s first officer delivered a mail bag and received in return a bouquet of daffodils from the postmistress. At one point an aged occupant of a motor boat stood up and saluted as the Minto passed him. And at Edgewood wharfa crowd gathered and sang Auld Lang Syne under a sign reading: “Goodbye old girl; gone but not forgotten. Though absent, ever dear.”

What happens to old steamers? Is there now no use for these dozens of determined pioneers who were part of the childhood of a good proportion of today’s British Columbians?

The Kookanook became a floating tourist lodge at Deanshaw, on Kootenay Lake, but today there is no longer a Deanshaw, and the Kookanook’s ribs lie on the lake bottom. The Kootenay became a floating house in 1920 and lay on the shore at Nakusp until she burned in 1942. The Nelson was burned as an attraction at a celebration at Nelson in 1913. The Kuskonook went to Molly Gibson Landing and was broken up, her timbers becoming parts of summer cottages.

But some relics remain. The paddle-wheel of the Nowles today lies alongside the saw mill wharf at Golden. The Nanaimkin had her decks cut away and became a car ferry, then for a time was used as a Navey Training ship at Nelson. But during the floods of 1948 she came to grief. Now her superstructure and wheelhouse, lifted ashore, have become a handicraft center. The Sticamous can be seen at Penticton, housing a small museum, and her dining room is used for service club banquets and wedding receptions. And all that is left of the Marion—a 60-foot launched in 1888 for Capt. Armstrong and eventually doing service on three separate water routes—is the nameplate nailed to the wall of a cabin in Lrardeau. And so passed the paddle wheel era. One veteran captain, however, has refused to let it die completely. Seventy-year-old Capt. John Blackley, who operates a hotel at Radium Hot Springs north of Windermere Lake, has built a modern 60-foot sternwheeler with a 12-foot beam and christened it the Radium Queen. She is equipped with a 100-horsepower Chrysler engine and is used by the Blackleys for pleasure parties on the Upper Columbia River and for hunting trips. He solved the problem of low-level bridges by building his pilot house on hinges so it can be lowered when necessary.

The high tribute of emulation was paid sternwheelers by the city of Portland, Oregon, in 1947, when it decided to replace the old city-owned sternwheeler which had been berthing ships on the fast-flowing Columbia and Willamette rivers for 50 years. In spite of strong recommendations for a modern diesel tug, experienced river pilots held out for another sternwheeler because they argued, alone it could handle a ship that would otherwise need two to four diesel tugs to do it. So a second Portland was built for a half million dollars, and except for increased horsepower and oldered bulbs, its design could make no major improvements over ships built at the turn of the century when the most elegant packet cost only $45,000.

But neither the Radium Queen nor the Portland will work the small islands and shoals learned by their valiant predecessors, nor will their crews enjoy such calls as the one made by the Moyie shortly before her retirement. The boat landed at an isolated beach where an old man was waiting. The gangplank was lowered and the old man mounted to the deck where he was warmly greeted by members of the Fort Steele Foom.”

The old man thanked him and shuffled down the gangplank, back to his lonely cabin.