Four for One

When Imperial Oil decided last fall to split its stock, it wanted to accomplish two things: to make the stock available on the market at a price that might appeal to a greater number of investors and, hopefully, to stabilize the market fluctuation. The larger the market, the argument goes, the less effect individual transactions will have on it. And a stock that sells around $20 can expect to appeal to a greater number of people than one selling around 80, as Imperial's stock had been doing prior to the split.

The action won't affect the value of shareholders' investments. Splitting the stock four for one is like changing a dollar into four quarters—you have the same amount of money as before, except that you will be holding it in smaller units.

The 'quarters' in this case will be composed of three new shares of stock plus the old one that the shareholder now holds to make a total of four. Consequently, shareholders should keep the stock certificates they now hold—they are still valid—and add the new stock certificates to them.

In financial circles, this sort of operation is called a push-out, and Imperial will be pushing out three new shares for each one a shareholder owns. The method permits a considerable saving in clerical work, postage and the like, since Imperial has about 32 million shares outstanding.

Lee Girls

The gender of writers is seldom a matter requiring comment, and it would be a rare issue of the Review in which both sexes were not represented. This issue is somewhat exceptional, though, in terms of the subject matter that the women writers are concerned with: one of them deals with steam trains, the other, in a peripheral way, with racing cars. Neither subject is what you might think of as 'women's interest,' but neither of the writers are what you might call 'women writers.' They're writers, period.

Thelma Dickman, who went on the steam train excursion described on page 18, is an emigre British Columbian who has made her home in Ontario for 14 years. She has a show on CBC Radio every Friday morning at 11:03 called Thelma Dickman's World that might be described as 'hard-nosed' women's interest. It deals with people and ideas rather than child-raising and homemaking—you're more likely to hear about lesbianism on her show than cookie-making. Mrs. Dickman has written about subjects as wide-ranging as industrial cleaning ladies, the effects of tides, weather and the phases of the moon on fishing in the vicinity of Vancouver, and the harmfulness of noise. The Star Weekly, the Canadian Magazine, Toronto Life and Maclean's are among the magazines that have printed her work. And the Imperial Oil Review, of course. She worked on the Review staff from 1963 to 1965. This is her 15th by-line in this magazine.

Vicki Innes, who rode the racing car as part of her investigation of the pleasures of the Quebec Winter Carnival, is an emigre Hamiltonian who now lives in Toronto. She works on the Review staff right now, and this is her sixth by-line here, although she does other things for which she doesn't get printed credit. The Last Word in every issue is one of them.

Miss Innes' articles have dealt with such subjects as tires, how to get things out of oil wells that careless drillers drop down them, synthetic textiles, an old barn, and water conservation. With interests like that, you might expect to find her taking a spin around a frozen track in a hot car, especially if you also knew that she drives a sports car. But you would be jumping to conclusions. The best word to describe the way she drives her sports car is 'tentatively'.

But Vicki Innes and Thelma Dickman are not the only women who had a big hand in this issue of the Review. Every word that went into it, and a good many more that didn't, was typed by a beautiful reddish-blond named Judy Messer. 

Imperial Oil Review Volume 53 Number 1 February 1969
Fuel

THE NEWER THE AIRPLANE, THE OLDER THE FUEL. BUT THE KEROSENE THAT POWERS TODAY'S JETS IS A FAR CRY FROM YESTERDAY'S LAMP OIL

by Tom Weissmann
photos by Ron Cole

Slowly the big jet cases into its parking spot at the air terminal. As the engines whine down, ground crews connect auxiliary power and air conditioning systems. Trucks move into position to remove baggage, while another crew couples hoses to the underside of the wings to pump a new supply of fuel into the jet's huge tanks.

About eight hours earlier—around 3:50 a.m.—the big jet soared away from the Heathrow International Airport in England, a similar activity took place as the Douglas DC-8 jet was readied for its flight. There, at the Toronto terminal, nearly 20,000 gallons of turbojet fuel surged into the tanks to enable the jet to wing out over the Atlantic, over Greenland’s icy wastes, then over the lake-dotted reaches of Labrador to Toronto. Now another load of fuel is pumped aboard to prepare the plane for another flight that may span a continent or an ocean.

In today's jet age, hopping from continent to continent is a matter of a few hours; in the days of the propeller-driven airliner a transatlantic flight took more than half a day. Vibrations and sound levels were so high that it was a fatiguing venture even for seasoned travelers. By contrast, the jet soars smoothly above the weather with the engine’s sound merely a muffled sough.

Today’s traveler jets non-stop from Vancouver to London, England, in 9½ hours. His plane slices through the thin atmosphere seven miles above the ground, covering the distance at speeds of 550 miles per hour—and more when favorable winds lend a hand.

It is no longer unusual for businessmen and tourists to hop flights that whisk them from Montreal to Copenhagen, or from Toronto to London. The Orient is no longer remote. Jet man from the cold of Toronto winter to the balmy climes of Hawaii, 2,373 miles away, in just about 10 hours. And while they’re doing it, they use large quantities of fuel. The Douglas DC-8-63—the stretched 8th-in-service with Air Canada on its Vancouver-London “Western Arrow” run, and with CP Air on its Vancouver-Tokyo and Toronto-Honolulu routes, can carry more than 200 passengers and can take on as much as 20,000 gallons of fuel.

The success of jet aviation is very much dependent upon a vast and smoothly functioning supply network, largely invisible to aircraft passengers. But it’s there, at major international air terminals where the world’s airlines meet and in small and remote fields; it’s there wherever planes fly.

But it wasn’t like this when aviation was born in Canada on the crisp, sunny morning of Feb. 23, 1919. That was the day J. A. D. McCurdy lifted the “Silver Dart” off the ice of Cape Breton’s Bras d’Or Lake to fly about three quarters of a mile at an altitude of 60 feet and then to land.

McCurdy’s machine was fueled by a few gallons of the primitive automobile gasoline then available. The fuel needs of today’s jets and propeller-driven aircraft are so radically different from that gasoline as the craft are themselves from the ‘Silver Dart’. The demand today is for massive quantities of fuel of high quality.

Just getting large quantities of fuel into an aircraft quickly is a tremendous task. Today’s jet liner is refueled from highly sophisticated mobile fuelers and hydrant systems. At major air terminals such as Toronto’s International Airport a jet can be refueled in between 20 and 30 minutes depending on its fuel requirements. Fuel can be pumped at rates as high as 1,200 gallons per minute when required, and the rate will rise to 1,600 gallons per minute when the jumbo jets with their 30,000-gallon appetites get into service in the early 70s. With large numbers of flights coming in and out of major terminals, large quantities of aviation fuel have to be kept on hand. Toronto International Airport’s 17 storage tanks, each with a capacity of 40,000 gallons, are linked by an underground pipe line system that supplies fuel to airport apron hydrants. From this system, fuel is pumped into the jets while they are parked and made ready for flight.

Montreal and Toronto international airports together require about 230 million gallons of turbine fuel per year. This is slightly more than half the 450 million gallons of aviation fuel that are sold in Canada in the course of a year.

And refiners are expanding their manufacturing facilities to meet it. Between 1965 and 1968 the total amount of turbine fuels used in Canada increased by 72 per cent. The amount of aviation gasoline used went down slightly in the same period, reflecting the greater use of jets. Refiners are not only making more jet fuel; they are also making it better, with sophisticated instrumentation, stream analyzers, automated blending systems and computer-backed automatic monitors and controls to ensure high-quality aviation fuel.

Today, aircraft rely on two types of fuel: aviation gasoline for piston engines, and kerosene fuels for jets. Jet engines can use both kerosene, or a blend of kerosene and naphtha called ‘wide-cut’ fuel. Both are highly refined products. In fact the already high fuel quality and cleanliness standards of conventional aviation gasoline had to be raised even higher to meet the jet’s operating environment: piston engine planes generally fly at low altitudes where the air is dense; jets operate at high altitudes where the air is thin and the temperature around 70 degrees below zero. Petroleum refiners have met the challenge of this environment by developing fuels that burn cleanly without carbon deposits, is free from corrosive effects, and remains fluid at low temperatures.

Another reason that jet fuel must be far cleaner than the fuel used for piston engines is because the components of a jet engine’s fuel system have extremely small clearances through which large amounts of fuel must pass. Consequently jet engines are more susceptible to microscopic dirt and water contamination. Allowable solids in Canadian jet fuels are limited to one milligram per gallon, and water to 30 parts per million.

Contamination in jet fuels is a greater problem than it is in gasoline. The kerosene makes jet fuels more viscous than gasoline and one consequence of this is that they have a greater tendency to hold bits of other substances in suspension. This problem fell squarely into Imperial’s lap—and was solved—more than a decade ago when the first jets in North America began flying for Trans-Canada Air Lines in 1954—on Imperial fuel. For two years, the company spearheaded re-
search that developed filters of new design and new principles, as well as monitoring systems to test fuel quality, that are still the basis for the equipment being used today. At that time, Imperial was the only supplier of jet fuel in Canada, and it made only one kind; today all other oil refiners make it, but Imperial is still the country's largest supplier, and it makes three different kinds—one for carrier-based navy aircraft, one for land-based military planes (it is also suitable for some passenger aircraft), and a third for commercial jets.

As aviation reaches for Mach 3—the speed of sound—fuel assumes a dual role. Not only does it power the plane's engines, but it also becomes a cooling medium or 'heat sink'. As a supersonic plane slices through the stratosphere, certain areas of its structure, especially the wing leading edges, engine intakes, and the fuselage nose section heat up due to air friction. At Mach 3 they may get as hot as 650 degrees Fahrenheit.

Confronted with this heating problem, aircraft designers have suggested the use of fuel as a structural coolant, to be circulated through the hot areas of the plane's structure. Investigators have also studied its ability to absorb heat that is expected to build up in the hydraulic and oil systems; it might even be used to help keep the passenger compartment comfortable. The fuel's ability to absorb heat is determined by the amount of liquid in the system, the rate of circulation, and other factors. The amount of fuel determines how much heat can be removed without raising fuel temperature to a level where thermal stability might be affected. To the designers of the plane's fuel system, this becomes an 'engineering balancing act', in which various performance characteristics are traded off in order to achieve a workable system. Beyond that, engineers are also looking at the possibility of using a refrigeration system to keep fuel from overheating.

When the first supersonic jet transport flies, it will use one of the current kerosene fuels. But engineers are already searching for other fuels, and one suggestion is liquid methane. Liquid methane (made from natural gas) promises to be an economically competitive fuel for the supersonic jets now being built. A study by the National Aeronautics and Space Administration in the United States indicated that running costs with methane could be as much as 36 per cent lower than with conventional kerosene fuel. Since essentially more power can be obtained for a given amount of this fuel, striking improvements in performance could also be expected.

Methane is half as dense as kerosene, but has a 13 per cent higher heat content per pound. In addition, its cooling capacity is as much as seven times that of normal jet fuel, and it could be used to cool portions of the aircraft structure, such as turbine inlets. In some current jets, methane is used in a separate system to operate the air conditioning.

Since methane remains liquid only at temperatures below -250 degrees Fahrenheit it would have to be insulated. The rapid decrease in pressure as a jet climbs to cruising altitude creates the conditions for a loss of this fuel due to 'boil off' or vaporization. To overcome this tendency, complicated fuel systems may be needed in planes using this type of fuel. The U.S. study suggests that fuel...
vaporization could be eliminated by
chilling to cruising altitude more slow-
ly. Alternately, pressurizing the tanks
(the passenger compartments are al-
ready pressurized) might be an answer.
If the problem of boil-off and fuel han-
dling can be overcome, the NASA re-
searchers believe there should be no
turn out to be the fuel for the second
generation of supersonic transports that
are now in the preliminary design stage
in aircraft plants.

Besides methane, other fuels are being
considered. The French National Coal
Authority has studied fuel based on coal
tar. Using established hydrogenation
techniques with the assistance of a cata-
lyst, the French researchers have pre-
pared high-energy jet fuels with density-
to-volume ratios from high-boiling tar
fractions that cannot be made economi-
cally from petroleum. They admit that
production costs are still substantially
higher than those of kerosene, but they
considered the results sufficiently prom-
ing to warrant continued research.

Temperature extremes are of major
concerns when developing fuels for the
new jets. Present planes fly at subsonic
speeds where fuel temperatures seldom
reach 200 degrees Fahrenheit. At this

Fuel reaches tanks through a hose that filters
it, measures the amount, and monitors quality

Hydrants are located at parking circles at Toronto International Airport to allow refueling while baggage is transferred and aircraft are serviced

temperature, thermal stability is no
problem, and the current family of jet
fuels is satisfactory for the first genera-
tion of supersonic transport. At Mach 3
(about 2,000 miles per hour) tempera-
tures reach 450 to 500 degrees Fahren-
heit and a fuel with poor thermal stabil-
ity would break down and be unable to
deliver the power needed to run the en-
gines. However, a more critical selection
of hydrocarbons, the use of additives and
ultra-precise refining and blending
the fuel that can easily meet the tempera-
ture levels of Mach 3 flight.

Additives are widely used in present
day fuels. Lead is best known as the anti-
knock additive in fuel designed for pi-
loss-car-engined planes. Other additives in-
hibit corrosion, help maintain a fuel’s sta-
bility in storage, and more recent
developments are designed to control
static electricity, which is generated
when fuel flows through pipes, valves
and pumps at the increased rates re-
quired to fuel the big jets.

Aviation engineers are already inves-
tigating the problems and possibilities
of flight at Mach 6 and beyond. For
this hypersonic era, they envisage planes
having ‘miniature refiners’ to process
fuel in flight. Frictional heat generated
on the leading edges and the nose of a
plane moving at Mach 6 may be as high
as 2,500 degrees Fahrenheit while at
Mach 10 temperatures may reach 6,000
degrees Fahrenheit. This frictional heat
might be used in the airborne refinery
to make fuel.

This concept was suggested by a group
of chemists in a paper presented at a
recent meeting of the American Chemi-
cal Society. They suggested that a hy-
drocarbon liquid, methylcyclohexane,
could be used as an aircraft coolant
and fuel. Heat would be drained into
the liquid, increasing its temperature
and changing it into a gas. The gas
would then be put through a small cata-
lytic heat exchanger-reactor where more
heat is absorbed and where the gas is
changed into toluene and hydrogen,
both of which could be used as fuels for
hypersonic aircraft.

In other areas the search continues
for safer high-speed flight. To reduce
explosion and fire hazards in aircraft
fuel tanks, for example, U.S. Air Force
researchers have suggested filling tanks
with polyurethane foam. The foam soaks
up the fuel and also contains the fuel
ever, reducing the possibility of an ex-
losion if the tank ruptures during a
'crash' or is hit by a bullet. The foam it-
self takes up only three per cent of tank
capacity. In a demonstration, a bullet
fired into a fuel and foam-filled tank re-
sulted in only a slight escape of fuel.
Our man in the

AT RESOLUTE, IT'S DARK FROM NOVEMBER TO FEBRUARY, BUT LIFE ISN'T AS GRIM AS IT LOOKS

by Albert Martin
photos by Art James

'To survive in the far north you have to be... well, phlegmatic. The romance of the Arctic, huskies and dogmads flashing through miles of untracked snow, Jack London and all that-the only time anyone ever sees that in the real north is in old movies.'

So says phlegmatic Gerald Hiceock, who has spent a six-month tour of duty at Imperial Oil's farthest outpost, Resolute, where he works for Woodward's Ltd., the agent handling Imperial products there.

Some 7,700 miles north of Montreal, Resolute is the supply center of the far north. It sustains and supports four Canadi-U.S. joint Arctic weather stations; acts as a refueling site for RCARF airplanes on route to the weather station at Alert and as a stop for Norair, a commercial airline that flies a Montreal-Frobisher Bay-Resolute run.

In recent years, as interest in the exploration potential of the Arctic Islands has picked up, Resolute has also assumed the role of starting point for geological and oil exploration parties. It's from here that, through its agent, Imperial Oil services the fuel needs of residents and transients who pass through Resolute on their way to other places.

'There are two main things you've got to remember all the time in the north or you're in trouble. One is, you've simply got to get along with people. There aren't that many at Resolute, about 200, and if you get a hate on for one of them you'd find yourself seeing him every way you turned. You eat, work, watch movies and drink with the same people all the time, and you can't afford to get mad at anyone.'

Not that Gerald Hiceock drinks much, maybe one or two beers a month in his barracks-style hut, or in the recently completed cocktail lounge. He doesn't smoke, either, which probably accounts for his spending only about $15 on his own amusement during his first three months at Resolute. He paid out $6 a month for membership in the Arctic Circle Club (it includes the cocktail lounge), which provides him with a place to buy shaving gear, chocolate bars, aspirin, and see four movies a week. How were the movies? 'Ah, well, some of them were pretty old, but,' he hastily adds, 'some of them were just fine, and quite new, too.'

'Now, the second thing you have to watch is that you don't get to like the place.'

How's that? How could anyone get to like a place where 60-degree-below-zero temperatures aren't uncommon during the winter, and summer sometimes lasts only six weeks; where no sun shines from Nov. 15 to Feb. 1, and there's no light at all from Dec. 1 to Jan. 30.

'Maybe "like" is too strong a word for the emotion I mean,' Hiceock says. 'The long darkness has a strangely depressing effect on people, even on Eskimos. You aren't as enthusiastic about anything. It gets harder and harder to get up in the morning, to do your work during the day. My job with Woodward's Ltd. (Imperial's agent at Resolute) kept me busy, thank goodness. Apart from refueling incoming aircraft, Imperial heats all the buildings, including those in the Eskimo village, via a pipe line from the main storage tanks. All the surface vehicles, including Department of Transport and Eskimo snowmobiles, use Imperial fuel.

'What I mean is that as long as you can do your work, and tolerate the place, because you're making a lot more money than you would anywhere else, that's okay. But once you get to like it, your thinking is obviously becoming confused, you're allowing yourself to get narrower. If you can like living just fine, and quite new, too.'

High noon at Resolute. It's 500 miles north of the Arctic circle and pitch dark from the beginning of December until the end of January. on what is the fringe of nothing, you're becoming detached from reality. It's what the northern people call being "bushed". Since there's not a blade of grass, or a single tree, nothing but rocks, maybe you could call it being stoned.'

The lure that draws men to the north in 1969 is the same one that drew them there in 1849—a dream. 'I made $400 a month more in Resolute than I did in Goose Bay, and there's not much to spend it on,' Hiceock said. 'With seven children five of them in school, there's never enough money to go around. My time in Resolute will help. A young single man, without a girlfriend to miss, with the good food and good accommodation at Resolute, could stay up there without psychological harm longer than a man with ties in the outside world. He could make himself a good financial stake.'
During the working day, and when the weather is amenable, there's a good deal of activity for an area so remote. As many as 2,000 passengers use Resolute's accommodation facilities in a year (it isn't as though you never see any new faces), but the crowd scene is jammed into a few short weeks. In summer some of these visitors arrive with the icebreakers, supply ships and patrol vessels that call at Resolute during the fortnight that the harbor is ice-free. Last summer, in addition to three icebreakers and the patrol ship C. D. Howe, there were two supply ships; one with dry cargo, the other carrying petroleum products to recharge the Department of Transport's approximately two-million-gallon storage tanks. Imperial supplies the products under contract to the department.

After working hours, there are long daily card games, movies, listening to radio (the U.S. military station in Thule, Greenland, is the only one that regularly comes in loud and clear) and reading. Hiscock mostly reads newsmagazines, some of which are brought in on a random basis by airplane passengers, some of which are subscribed to by people who are in Resolute for a longer-than-six-months stretch of time. His wife sent up the hometown papers from Goose Bay occasionally; and the odd time he's even taken out a book from the Resolute library, although 'most of the books were left over from old RCAF days, and they're kind of moldy and deteriorated and almost all out of date. Besides, I'm not interested in the philosophy of the past or the visitations of the future. Both these times involve other people, but the lifetime of an individual is the vitally interesting one to him, so news magazines are my favorite reading. They're all about today.'

Today, at Resolute, most people seem to get along very well, rather like a family, with small quarrels and flareups, but with a strong sense of kinship nonetheless.

Everyone man is responsible for his own housekeeping in the small, almost monastic room he occupies, but Eskimo girls clean the corridors. The cost of living isn't high for the man who represents Imperial's agent, because he's subsidized by Woodward's; the food that's eaten in the central canteen is good and there's plenty of it.

There's really nothing wrong with living at Resolute except, maybe, that painful, crystal-like silence in the air when the wind isn't blowing; the mind-numbing days and nights of total darkness; the smell of the suitewed books in the old library; the rope that's always strung from the barracks to vital areas such as the power plant (with visibility dropping to zero in the vicious, stinging blizzards, a rope is often the only lifeline a man has); and above everything else, the empty space in a man's mind and heart that can only be filled by his family, hundreds of miles to the south. But the money's good and the job is a pretty good one. Good enough to go back to, certainly. After his hitch at Resolute, Hiscock went back home to Inuktitut in the southern warmth of good old Goose Bay. But do you know where he is now? Right back in the Arctic, selling Imperial's products at Frobisher Bay on Baffin Island.
A word or two about
A WONDERFUL WINTER FAIR
by Vicki Innes
photos by Ron Cole

The Quebec City winter carnival is a wonderful experience for a Toronto girl. There they are, right out on the street with their arms around each other, dancing. It looks like a great way to keep warm. The inhibited Toronto girl merely jumps up and down in one spot and it’s not nearly as satisfying. But then, she never learned street dancing in Toronto.

Let other people talk about the sociology of it. They can say French-Canadians don’t need lessons on how to enjoy life, or that they have a joie de vivre lacking in staid old Toronto. I won’t. I just want to talk about the carnival.

Most of those things you hear about the world’s largest winter carnival are true. The dancing and singing in the streets. The sparkling-clear cold (not bitter, bone-biting cold like Toronto’s). The friendliness, the gaiety. Good food. Etcetera.

SATURDAY: Rush dinner to get to the big night parade. Children are bundled up against the Quebec cold—the thermometer drops to 14 below zero that night. Adults fill the white, hollow plastic ‘cans’ that is a Carnival trade-mark with liquid to keep them warm. It seems everyone in Quebec City has come to see the parade.

Twenty floats—illustrating the 1968 carnival theme: Chan-
tons, Dansons, c’est Carnaval (Let’s sing and dance, it’s carnival)—and thousands of cheerleaders, musicians and costumed marchers go by over the next 55 minutes. The parade is three miles long and at one point in the evening it covers the entire route through Lower Quebec. We Toronto people jump up and down to keep warm and watch others, less inhibited, surge out onto the street during a break in the parade to dance and sing. Next Saturday, the same spectacle will unroll in Upper Quebec.
SUNDAY: Esso Grand Prix on the Plains of Abraham. A beautiful day: great contrast to the howling blizzard that plagued yesterday’s practice session. Some drivers sitting in open cars mask their faces against the cold. Jacques Duval offers to take me round the track in his Porsche before the race. It feels a bit like a drive in the country, with the picturesque setting above the St. Lawrence; the speedometer staying well under 90 miles an hour. The track only seems easy, though. There are bumps that send the car into the air; if it happens going into a curve, the driver must be certain the wheels are in the right direction when the car lands again. He must also watch for drifting snow. Despite such hazards, Duval goes around the 1.2-mile track at an average of 62 miles an hour, reaching 105 miles an hour at times, and wins the Esso Grand Prix.

ANY DAY: The ice sculptures. There’s the ice palace, a huge, fairy-tale structure made almost entirely of blocks of ice. It’s properly impressive, but the Rue Sainte Thérèse is marvelous. Two hundred and fifty sculptures line the street—called Rue Carnaval during the festival—and each one is a surprise. There’s a dog watching a hockey game on TV, an alligator and a kangaroo, a snake climbing a pole. They are made by residents of the area, using frozen snow coated with ice. The sculptures are all good and carnival authorities don’t even attempt to choose the best. They distribute cash awards by a draw.

The two-week carnival has other attractions. There’s the ‘canoe’ race across the St. Lawrence from Quebec City to Lévis and back. Five men in each of the wooden boats—‘battle the current, the wind, the ice and their competitors in a race that may take four hours. The men wear rubber boots because they have to get out and pull the boat across ice floes. There’s also a broom-ball tournament, played on a hockey rink. The rules are similar to hockey except that the players use a broom and a ball and wear overshoes. And there’s a dog derby, which has teams of about 10 dogs each pulling a driver and sledge over the 18-mile course in an hour, flat. The snowmobile race is a faster event with drivers zooming around the half-mile track at speeds averaging more than 70.

This year the carnival—the 15th—runs from Feb. 5 to 18. Its theme is Le Bonhomme Carnaval dans l’espace. The pre-carnival period—to get people into the carnival spirit—starts Jan. 6, during this month, the duchesses and queen will be crowned and Le Bonhomme—the snowman who represents the carnival—makes his first appearance.

But don’t take my word for any of this. See it for yourself. Rooms are still available—in private homes if not hotels—through a housing committee set up by the municipal tourist office at 60 Rue d’Autueil in Quebec. Just take along your warmest clothes and memorize the words of the carnival chorus:

Carnaval, Mardi Gras, Carnaval
À Québec c’est tout un festival
Carnaval, Mardi Gras, Carnaval
Chantons tous le joyeux Carnaval. ☺

Some 5,000 blocks of ice, each weighing 400 pounds, form the ice palace. It’s the setting for street dancing.
The excited youngster cranes his neck for a better look at the big engine.

A teen-ager walks by wearing blue and white striped overalls and engineer's cap, the hat covered with badges reading Lehigh Railway, Arcady and Atlantic, and Tweeters Railway. Blowing Rock. His friend sports a red and white polka dot railway man's hat and neck scarf, fastened with a button reading 'God Save Steam'. Parents carrying loaded picnic baskets herd children up the steps of the train.

Even at 7.30 on a frosty Sunday morning, the crowd of 600 people assembling to go on the first steam engine excursion of the year has a light-hearted, carnival air.

The Upper Canada Railway Society runs three trips a year out of Toronto (usually January, June and October), and last January's ran north from Toronto, counter-clockwise around Lake Simcoe, and return. Bert Oliver, a retired Imperial Oil employee, is generally on every one of them. The only life member of the society, he has been a railroad enthusiast since the 30s.

'People usually think that a railroad man means somebody that's crazy about model railroads, but that isn't necessarily so,' he tells me. 'Railroading can mean anything to do with the lines—historical interest, preservation of the old engines, schedules, everything like that. Steam engines are just a special fetish.'

The train gives a tentative toot on the whistle, then starts with a spine-
a trip, perhaps because they devour coal like hogs.

Although there are one or two small steam trains still used on logging lines in British Columbia, the engine pulling our 13 cars of railroad buffs is the last operating engine of its size and class in Canada. It's known by its number—6218. The coach I was riding in had an air of faded middle age. The windows were just that much smaller than today's streamliners, the seats that much narrower, the paintwork that much more worn. A lot of trains had gone under the bridge since it was built in 1933—this year prohibition was repealed in the United States, and Hitler was made chancellor in Germany. Dreamily I thought of the trip my parents had made across Canada that year, when my mother was only 30 years old; perhaps they'd sat in this same car. They could have; 6218 served on all the major runs in Canada, including the transcontinental run.

But there wasn't time to dream for long; the train was slowing down for a run past.

Although many railroad enthusiasts stay in their seats through the entire trip, content in the knowledge that they're riding behind old 6218, veteran of a million miles, the majority of steam men want to take pictures. The instant the doors are opened, thousands of dollars worth of expensive photographic and recording equipment is lowered gingerly to the ground, and people clump themselves along the track in the best locations like ants on a jam sandwich. The train backs down the track for several hundred yards and then runs past, steam erupting like a geyser from its stack. The whistle gave the mournful cry I used to hear echoing across the prairies of Saskatchewan on bleak winter nights. That sound can break your heart.

After the run past the engine stood on the track like a great black station, shuddering and breathing hard from...
the gals down the track. It was a strangely moving sight, and one that won't be seen much longer.

Time is running out fast for the last steam engines in Canada. Old 6218's last overhaul, in 1963, cost the CNR between $20,000 and $30,000. The next one will cost even more. Parts must be custom made at high cost, and steam engine mechanics are hard to find. As the old steam men retire, they take with them the knowledge needed for repairing the big engines. Eventually 6218 will end its days standing in a public park as a monument to a past era.

But in the meantime, crowds of tape recording fans swarm into the open baggage car hoisted on behind the tender, where every chuff of the engine, every tick-tock of the wheels, every ding-ding-ding-DONG of the siding bells, is recorded. Dozens of people waiting for us on the sidings wave as we sweep by. One man, a third generation railroader, turns away from the old potbellied stove to explain: "These people come mostly to see and hear their memories. They remember when they were kids, how life was more peaceful and less complicated in retrospect, and the arrival or passing of a train was a pretty big thing in their lives then. Steam engines, they're all different; they've all got personalities of their own. Diesels—He spots out the sliding doors.

Although we didn't know it at the time, in the cab ahead the firemen were cussing and swearing over the firebox, while just about everything went wrong with the engine. Some of the men I spoke to nodded their heads wisely and said: "That old engine is having troubles today." They assured me the whistle didn't sound normal, the wheels weren't lining right, and we should buy as many sandwiches at the snack counter as possible and get ready to arrive at the station an hour or two late. "Happened before," remarked one roller-coaster man with a Beale mustache. "Couple of excursions ago we didn't get back till 2 a.m. Station was closed up tighter than a pickle jar and I didn't get back to my wife till 3 a.m. Never did get her to believe that one."

Outward bound, the train chuffs around a curve on its 187-mile-long trip

Homebound bound, and four hours late, tired children curl up and go to sleep

End of trip. Camera-hung passengers climb off and head wearily home

Everywhere the stories about old steam engine days were flowing in a steady stream, with the technical experts discussing the merits of live steam, welded tubes, types of train and even the touch certain engineers had on the throttles of their locomotives. Many young boys could rattle off the schedules of every train in Canada, the way others might quote statistics of the peaks Bob Pettiford also did in 1963. This bland but steaming mass seemed to be no place for a girl, and I wandered through the cars, avoiding the knots of bowing children.

I asked an elderly woman why she'd come on the steam excursion. She looked at her faded blue denim eyes and replied: "Why, it's an escape from the house, dear, just an escape."

A young Moomie, when I told him the story, smiled and said: "Well, I guess it's an escape for me too. You could call it an escape to nostalgia.

At 10 o'clock 6218 literally ran out of steam, shuffled tidily onto a discardsiding, sighed like Snoopy and died.

A group of people in the baggage car began singing "When the Day is Done." Outside the communications room, men who had reservations on trains or planes returning to the United States and other parts of Canada formed an anxious line. Teen-aged couples curled in each other's arms simply shifted their position and slid back into dreams.

Later, somewhere in the Toronto train yards, two engineers turned the keys in two diesel engines, and eventually 4 1/2 hours behind schedule, the Upper Canada Railway Society excursion was realized and pulled into the deserted railway station.

Clinging to the last shred of his affection, a steam man said defiantly: "I'll bet you don't know it takes two diesels to do the work of one steam engine."
ON HIS OWN

Tom Braybrook does a lonely, tough, demanding job in a harsh and desolate region, and he loves every minute of it

by Robert Collins
photos by Gunnar Johanssen

He is near to total independence as a wage earner can be in these times. Nobody tells Tom Braybrook how to do his job. Nobody tells him when to get up, or start work, or take a coffee break. So, on this particular morning, he is up at dawn as usual. He is his own boss but Braybrook never lets Braybrook go off.

By 8 a.m. he has breakfasted, slipped on his old blue parka and pulled on his peaked cap over thinning red hair, adding another angle to a profile that is already all sharp planes, weather lines and laugh wrinkles. He puts his dog good-by and shuts the door on his trailer-truck, parked permanently in a farmer's yard.

It is a glittering spring morning up here at the top of British Columbia, 30 miles north of Fort St. John. The sun is glinting off a 10-inch featherbed of fresh snow, the air is sharp and dry as vintage champagne. The only sound is the shush-shush of feet as Braybrook—medium height, strong of arm and shoulder, narrow of hip, with none of the average 41-year-old's excess flab—scares toward his red Mercury pickup with the urgent step of a man who has an appointment. And so he has, with the Rigal natural gas field.

Today, as every day, he will drive 95 miles over backwoods roads that would send the average city motorist into hysterics, tending the 12 Rigal wells that Imperial Oil operates. It is a solitary, important job that few men could do as well and no machine could do at all.

Rigal helps feed the West Coast Transmission System. The gas finds its way into an 866-mile pipe line that winds under Peace River bush and grain fields, through Rockies and forests, through the Cariboo country, over or under seven major rivers and 70 small streams, among pretty little Fraser Valley dairy farms, to Burlington at the international boundary. Some of the gas serves British Columbians along the way; much of it goes on into the United States. And finally some housewives in California lights a burner because, away back here, a utility man named Tom Braybrook made sure the gas went through.

Things could go wrong today, as on any day: a leak, a frozen line, even a fire. The odds are against it but Braybrook must be ready to solve any problem, on the spot. There's nobody around to hold his hand, which is how he likes it. ('It's a good arrangement for Tom and us; he does a fine job and he likes living out there,' his division boss, Ken Oakley, was saying the night before in Dawson Creek, at the south end of the Alaska Highway. And over east of the Rigal, at Boundary Lake, Imperial's production foreman and Braybrook's immediate superior, Norm Stewart, had added: 'As long as he keeps on doing a good job, I leave him pretty much alone.')

Now, turning onto the road this white eye-squinting morn ing, Braybrook runs up why he and his employers are happy with the set up: 'Out here, you can't go by the book. And I've never got into a bind I couldn't get out of.'

He is picking his way through the hub-deep blanketness of snow at an easy 30 m.p.h., gearing up and down instinctively. After maybe 100,000 miles of these roads in five years Braybrook gets no pleasure from driving. It is a necessary job that he does exceedingly well. This morning the trailer has almost vanished. In other seasons it will be crossly rough, or a quagmire. It is surrounded by treacherous making patches that will swallow up any vehicle unlucky enough to slide off.

There are hairpin turns that have pulled leaser drivers over sharp embankments. Braybrook has never gone over an embankment. He's been stuck but worked his way out with logic, brush and know-how. He is almost a part of the truck, an extension of wheel and gear shift, and the truck is his most important tool. It's equipped: fire extinguisher, hunting knife, chains and shovel, regular and four-wheel drive, and powerful radio telephone that links him with Imperial's offices and the Fort St. John telephone system will help him through most emergencies.

This morning he is still enjoying the scene he has viewed a thousand times before: Spruce, poplar, pine and tamarack; steep hills; the Beaton River carved through high banks; an Indian reservation; a scattering of new farms. This is still pioneer country. Braybrook can recite a brief history of every farm he passes; name the occasional Indians that wave from the roadside; identify the fresh animal tracks that cross the road.

He turns in at the first well, a small tower and galvanized oat bin in a clearing. Three thousand feet or more below
the spaghetti of pipes and gauges inside the hut lies the Lower Cretaceous. This geologic formation was laid down 125 million years ago in a strange unsavory world of shallow seas, trillions of marine creatures, ponderous dinosaurs and weird flying reptiles. Now, from that incredible faraway time, natural gas is rushing up to this wellhead.

It’s ‘vent’ gas, containing water and other impurities. The water must be removed immediately or it will freeze in the line (this can happen even in summer because expanding gas creates a refrigeration effect). So here at the well, glycol is added to the gas stream and absorbed most of the water; the gas is separated from the glycol-water mixture and sent on to a nearby fractionation plant at Fort St. John for further treatment; at the well the glycol is separated from the water and is returned to the raw gas stream for a new absorption cycle.

A frozen gas line is serious trouble. If it happens, he first tries to blow out the ice plug with high pressure, working at it all night if necessary. Once he was almost blinded when a line ‘blew’ and dribbled his eyes with wet gas. If blowing fails, he improvises. Once an Imperial visitor found Braybrook in the below-zero weather, thawing a frozen line with rags soaked in hot water from snow he’d melted in an old oil drum.

Always, in clearing a line, there is the danger of a fire that, once started, can become an inferno in seconds. Earlier this spring, Braybrook’s counterpart in another company was burned on the job. It raised the recurrent question: should Braybrook have a helper? He argues against it: ‘If you put two guys on a job where there’s really only work enough for one, something is liable to be left undone.’ Furthermore, he doesn’t want to share the field with anyone. He treats the wells as though they are his own.

As the truck juices on to other sites he talks about them like children: ‘This is a good one, it’s sure made a pile of money for us’ and ‘This one’s a troublemaker, I really have to watch it.’ He explains how in spring he has the additional job of steaming out frozen culverts before his roads are flooded and, in summer, cleaning and painting-up each wellsite. And he thinks back over the years that fitted him for this jack-of-all-trades job: farming in his native Manitoba, mining in B.C., a year in the army, a lifetime of hunting and the outdoors.

He joined Imperial in 1956 and a succession of field jobs showed him to be that rarity—a man who likes problems and likes to work alone. He was transferred to the Dawson Creek division in 1962, the same year Rigel was delineated as a gas field. ‘They planned to handle this job in shifts, but I was lucky and got it full time.’

Some would say: ‘What’s lucky about it?’ Right now, for instance, Braybrook is at the bow of a murderous-looking hill. ‘I have to put or four-wheel drive here or she gets away on me,’ he explains. As he pushes the growling truck down a scornful road, gesturing cheerfully with one hand at a set of moose tracks—the only mark in the thick snow ahead—and complaining mildly that there seems to be snow in the brakes and he hopes they will hold. At one switchback corner he chuckles: ‘This one’s the beater. Not too bad going down, but coming back up you need enough speed to maintain traction and yet if you go too fast, you miss it . . .’ A 200-foot sheer drop off one side is what happens if you miss the turner.

At the bottom in the Beaver River valley another well waits, like a speck in a huge white cap. Braybrook makes his records and, with a fine flurry of gears, gets safely around the ‘beater’ corner and back uphill.

By late afternoon he has finished. He steps to radio Boundary Lake; over and over; 528 to Imperial Boundary, do you read me? Finally, by parking on a hilltop, he gets a message through the erratic airwaves. Then he takes his first break of the day—coffee at Ross’s general store. Ross’s place is an isolated outpost straight out of pioneer history, where you can buy groceries or fuel oil or mukluks or coffee and pie. A few farmers, truckers and Indians drift in and out. Everybody green, Braybrook looks around his beer, while he talks about pipe lines and trucks and hunting and dogs. He is a man with links to the outside world, a job with a big company, yet he is also one of them, a man who copes better than most. (Well, remember the time old Tom’s sepia tank wasn’t working, over by his trailer? And he figured it needed an air vent? So what did the son-of-a-goon do? Fired some rifle pellets into it with a shotgun. Sure made an air vent! Tank’s worked fine ever since.)

He finishes his coffee and swings back into the cab. Tonight maybe he’ll take the dog, Reno, for a run. Or drive his new Cougar into Fort St. John, except he has no desire to loaf around drinking beer. More likely, because there 95 miles tire a man, he’ll watch some TV on the single channel and roll in early. Most people would call it lonely but Braybrook has inner resources.

Driving back, past a scar of fresh-cut timber, he says: ‘I used to come along here and see a lynx now and then, great big overgrown housecat, sitting there on a log just as independent as you please. But you don’t see them much any more. Settlement’s driving them back.’

It’s the same with all the other loners, the independent ones. You don’t see many Tom Braybrooks any more, either.

The northwest corner of British Columbia is Tom Braybrook’s kind of country—big, silent, thinly settled—where a man can rely only on himself.
Whatever happened to long underwear?

by James Bruce
illustrations by Bob White

The Consumer Price Index doesn’t say what happened, exactly, but it does tell you when, plus a lot of other things about the way Canadians live.

The Consumer Price Index has not only tracked the changes in the prices of goods Canadians buy, it has mirrored the changes that have taken place in the Canadian way of life. In order to give a true picture of price conditions, the index changes with the times; as Canadian buying habits and living standards change, some items are dropped from the index, others are added. Long underwear, for example, was a basic item in the index from its inception in 1919 until 1957. Women’s housedresses were also dropped in 1957 to be replaced with slacks, outfits and skirt and sweater sets. Also added were men’s cotton sport shirts, plane fairs, sporting equipment and TV sets—reflecting the pleases of more leisure time.

Coal stoves disappeared from the index in 1938—a reflection of the increasing swing to oil burners for domestic heating. For the same reason, wood as a household fuel was dropped; the same is adequately reflected in the total index. Gasoline first appeared on the index in 1913. As the years passed more and more weight was attached to it because of its importance and everyday usage in the family budget. The index shows that gasoline has increased less in price than practically any other commodity, despite steep increases in the federal sales tax and the provincial road taxes which are included in the index figure for gasoline price. Actually, if it were not for taxes, people would be paying less for Gas today than 40 years ago.

Currently about 300 goods and services are priced in 33 cities—by economists and statisticians in the eight major cities, by part-time staff in seven smaller centers, and by mail surveys for the remaining 18. At the home base in Ottawa, technical personnel keep track of particular consumer commodities and services and of merchandising conditions across the country.

Prices are gathered from a sample of outlets in each city. For example, food is priced in chain stores, independent grocery stores organized into voluntary chains, supermarkets, discount stores; clothing and home furnishings in department and specialty stores; automotive items in garages, service stations, and automotive dealers, and doctors’ and dentists’ fees through their offices. Frequency of reporting varies for the different items—food, clothing, home furnishings, rent, house ownership costs and fuel and gasoline are priced each month. Information on items whose prices are more stable is gathered less frequently. Automobilia, for example, are priced every two months; newspapers twice yearly and automo-

bike licenses and property taxes only once a year.

The people who make the purchases on which the index is based are a rather special group. They include only people who live in urban centers of 30,000 or more. They are all families raising in size from a childless couple to a family with four children, and their annual incomes are between $2,500 and $7,000. They represent more than 75 per cent of all income levels of urban families of medium size in Canada.

In 1919, when Canada began measuring the changes in the prices of things the target group buys, price surveys had already been in existence for many years. Studies of people’s buying habits date back to 1829 when a young French economist named Frederic Le Play carried out what he termed power-

ity studies in several European countries. These studies gave the German econ-

omist Ernst Engel the basis for his con-
sumption law. One fundamental state-
mant of these laws said that as income rises the proportion of buying power de-
The last word
by Vicki Innes

WHAT TO DO ABOUT WINTER

There are three ways to deal with a Canadian winter:

a) Enjoy it
b) Pretend it could be worse
c) Hibernate, and dream about summer.

Whichever way you choose, synthetic materials can make your winter more fun, easier to bear, or very nearly forgettable.

The people who actually like winter complain that it never lasts long enough. For them, if they are skaters, the winter season can be extended with artificial ice. These rinks would last even longer—more than a month, it is estimated—if they were enclosed by an oil-derived plastic tent. Eventually, we may be able to skate all year on a warm, dry, milky-white surface that is as smooth as ice but 20 per cent slower.

Ski enthusiasts try to prolong winter with artificial snow. Made by spraying an atomized mixture of water and air onto the hill when the temperature is between zero and 29 above, artificial snow lasts longer than the fluffy, natural kind. At a ski resort near Huntsville, Ont., last April, skiers dressed in shorts and shirts for the 70-degree weather walked through mud to reach slopes that still had artificial snow although the surrounding hills were bare. At some points the snow was two feet deep.

Various schemes to extend the ski season still further have been tried. There were fluffy styrofoam pellets (which disappeared into the woods with a wind) and long strips of plastic (which did not allow the ski to bite on a turn). Mats with nylon bristles were great to ski on but not so great to fall on; the bristles were sharp enough to tear clothing and ‘burn’ skin. Now a new, flexible, polyethylene plastic ski surface has been tested at European resorts. It consists of interlocking units covered with thick, rounded bristles that cushion a fall. Skiing on the mat is apparently slower than on snow, but an excellent conditioner.

If you go through winter resolutely holding the thought of April like a carrot before you, there are still things to rejoice about. It’s true that cars do get stuck on cold, snowy mornings but tires that churn through snow and bite into ice do help. There’s also a spray-on ‘chain’ said to give tires three times more traction on ice. When applied, the solution reacts with the water in ice to form a sticky ‘extra tread’ that lasts up to 35 miles. Firemen tested the solution on the soles of their rubber boots and got better traction, too.

For people who spend their winters wishing they were in Florida and scowling at winter-lovers, there’s not much cheer in Canada. Still, with a plastic cover, they can turn at least a small area of their lives into summer. An outdoor swimming pool can now be used all year if it is covered with a plastic bubble. One type of enclosure available in Canada is made of polyvinyl chloride film 12/1000 inch thick and supported by pointed arches of galvanized steel; it lets the sun’s rays in to provide an average of 75 per cent of the heat required. Owners of the durable covers say they withstand high winds, ice storms and 24-inch snowfalls. Plants growing inside the enclosures add a touch of summer. And enough ultraviolet rays pass through the clear vinyl to keep swimmers evenly tanned.

Plastic covers—whether supported by air or steel—help provide the illusion of summer in other ways. The Toronto Cricket, Skating and Curling Club installed a plastic tent over a tennis court last October. The green and white enclosure is supported by heated air. It is less than an hour to erect. Plastic-coated nylon fabric air shelters have also been used in Canada to keep winter off sports fields. One man plans to use one over a riding paddock.

Sitting beside their winterized pools, winter-haters can dream about the ultimate in plastic bubbles: the dome-covered city. R. Buckminster Fuller, the man who created the United States pavilion at Expo 67, sees his geodesic dome as the forerunner of an enclosed community offering total protection from the weather. He has proposed that a geodesic dome two miles in diameter be raised over Manhattan, and T. W. McLeod, former executive vice president of the Canadian Refrigeration and Air Conditioning Association, suggested that three quarters of Metro Toronto could be covered by an air-supported dome. If this happens, we can throw away snowshoes and shovels, lie back in the sun and forget about winter for good.