WHICH WILL IT BE? POWER OR ECONOMY?

In recent years automobile engine efficiency has been improved, largely by increases in compression ratio. These improvements have given motorists increased horsepower, faster acceleration and greater comfort. They have also permitted the introduction of automatic transmissions, and of accessories such as power steering and power braking, self-actuating windows and in some models, even air conditioning.

The average compression ratio for 1957 cars was about 8.5-to-1. Now, some cars on the road have compression ratios of more than 10-to-1 and many engineers predict 12-to-1 ratios in the next few years.

As compression ratios continue to rise two possibilities present themselves. One is that the increasing efficiency of automobile engines will continue to be used to develop more power, to provide higher speed, quicker acceleration and to operate more accessory equipment. The other possibility is that it will be devoted to the basic job of driving the car along the road with a resultant increase in mileage per gallon of gasoline consumed.

If the increased engine efficiency is used to attain greater gasoline mileage, a rise in compression ratio of, say, from 9-to-1 to 12-to-1 could raise miles per gallon by nearly 20 percent. If the improved engine performance made possible by advanced design and high-quality gasoline were used to bring this about, then per mile gasoline costs could, presumably, be reduced.

However, such an improvement in gasoline mileage cannot come about if there is a continuing demand from the motoring public for still more power and for accessories and other extras that consume power.

For instance, one of the many things that have added to the motorists’ comfort has been the greater weight of many late model cars. This in itself has been a limiting factor in gasoline economy notwithstanding the remarkable achievements that have been made by oil refiners in manufacturing gasoline. The heavier the car, the more gasoline it takes to drive it a given distance at a given speed; consequently much of the gasoline quality improvement has been used this way.

In the long run, the motorist will decide whether gasoline improvements will be devoted to more power and convenience or to economy and more miles per gallon. Automobiles are built to please him and meet his tastes. However, whether he gets a car which will provide greater gasoline economy or greater power and more accessories, he can rest assured that the oil industry is spending millions of dollars to give him the high-octane, high-quality motor fuel he will require.

IMPERIAL OIL REVIEW
VOL. 41, NO. 5, OCTOBER 1957
MIRACLE OF MARACAIBO

by HAL TENNANT

Producing oil from under a lake doesn’t faze the Venezuelans. They simply perch a derrick and 100 tons of pipe in water 90 feet deep and start to drill.

OF ALL the true tales of oil men who have turned seemingly fantastic schemes into practical, work-a-day operations, few are more spectacular than the story of how they get the oil under Lake Maracaibo.

It's a story that has a direct bearing on the daily lives of every man, woman and child in Quebec and the four Atlantic provinces. Situated as they are, outside the economic reach of western Canadian oil producers, these five provinces import their crude oil from several sources. One of the most important of these is the Lake Maracaibo region, in western Venezuela.

Lake Maracaibo is a balloon-shaped body of salt and fresh water — 115 miles long and 70 miles wide — slightly larger in area than Lake Ontario. From the north the salty Caribbean Sea pushes in through the neck while fresh water trickles in through dozens of little rivers that puncture the lake’s shore on all sides.

Below the lake bed, at depths ranging from 3,000 to 14,000 feet or more, lie rock formations containing vast quantities of oil. More than any other oil-bearing region of Venezuela, Lake Maracaibo has helped make the nation the world's second largest oil producer (next to the United States), with production of nearly three million barrels a day.

Finding and producing oil that is trapped in porous rock a mile or two below the earth's surface is never an easy job. But the oil under Lake Maracaibo is an unusually tough challenge.

Men who seek it must take their turns in round-the-clock drilling operations that continue for weeks at a
time in spite of the hazards of a water-borne operation and the heat of the tropics. Temperatures rise above 100 degrees Fahrenheit in the shade—and there's no shade to speak of.

The structures on which the oil drillers work must be strong enough to support heavy equipment, including a derrick and 100 tons or more of drill pipe. The drilling platforms must be big enough to stand safe and firm in 100 feet of water. They must also be immune to the attacks of teredos, a species of water-borne worm which infests the lake. In the early days of Lake Maracaibo oil, drilling platforms were mounted on wooden piles, and the teredos gorged themselves, often undermining the structures.

The lake's biggest operator, Creole Petroleum Corp., has solved most of these problems with an ingenious combination of unorthodox methods, custom-made materials and specially-adapted equipment.

In a $2 million pile-casting yard at La Salina, on the eastern shore, huge, squashish "timbers" of reinforced concrete are cast and hoisted onto barges. A typical pile, three feet square at the butt end and 196 feet long, will weigh 165 tons. A dozen of these piles will go by barge to the drill site, where a giant crane takes over, lifting and dropping them one at a time into position in the lake bed. Each pile is lifted by the crane's steel cables, which are attached to pins hammered through holes in the middle and top end of the pile. When the pile is dropped into place it will sink 30 feet under its own weight. Then the construction boss gives the signal and a professional diver, equipped with nothing more than a bathing cap, trunk and a pair of rubber sneakers, plunges into the lake and pulls out the lower pin, freeing the cable. When the upper sling has also been freed, a dead weight of 200 tons pushes the pile in deeper, and a steam-powered pile-driver finishes the job.

When all 12 piles are in place, arranged in corner groups of threes, a reinforced concrete platform, typically 24 feet square and weighing 25 tons, is mounted on them. Onto the platform goes the derrick. All this work may cost anywhere from $50,000 to $120,000—before the drill has even begun to turn.

Until recently, a derrick once erected was left in place when drilling was finished. It cost more to disassemble, move and reassemble a derrick than it did to put up a new one. But now Creole has a marine crane adapted for moving assembled derricks, and Lake Maracaibo oil workers have grown used to seeing one of the big steel towers marching, still upright, along the lake to a new well site.

Since the platform is not heavy enough to hold much more than the derrick, a drilling barge is towed in and fastened alongside. On the barge are the power plants, pumps, fuel tanks, drill pipe stands and other equipment used in rotary drilling everywhere in the world.

While the drill continues turning night and day, crews move back and forth between the rig and the shore with each change of shift. If and when oil is found, specialized crews move in to put the well on production, hooking it up by pipe to a flow station mounted on piles nearby which separates the oil from the gas usually found with it. From there the oil enters an underwater pipe line leading to storage tanks ashore. Creole has 1,300 miles of underwater pipe lines to serve its 2,000 Maracaibo wells.

The gas extracted from the mixture is re-injected into the oil-bearing formation by a plant very much like Imperial’s gas injection plant at Golden Spike, Alta., except that this plant is seven miles from shore. In being returned to the formation, the gas remains stored for future use while putting enough pressure on the oil in the deposit to increase immediate production by 50 percent and ultimate recovery by 33 percent.

Once the oil is ashore, it is carried by pipe line to Amasya, a refining and shipping centre on a desert peninsula which juts out into the Caribbean from Venezuela’s northwestern coast. Some of the oil received at Amasya goes into the refineries, but the greater bulk of it is loaded
onto tankers, such as the new Imperial St. Lawrence, which picked up its first load of crude there last spring (see "I Sailed the New Queen of the Tanker Fleet," page 28) and carried it to Imperoyal refinery across the harbor from Halifax.

Besides drilling enough new successful wells each year to keep production on a constant increase, Creole has lately been busy on a project that will make its output even more readily available to foreign customers like Canada. While the Venezuelan government dredges the lake entrance to supertanker depths, Creole is building a marine terminal and carving out of the lake bottom a 38-foot-deep channel and turning basin. The terminal, almost a mile from the eastern shore of Lake Maracaibo, will have a large storage area and two piers, each able to berth two supertankers.

When the terminal is ready for business, ocean-going tankers like the St. Lawrence will no longer be shut out in the Caribbean. Instead they will steam in through the newly-dredged channels to become, in a sense, a functioning part of the miracle of Lake Maracaibo.
BECauses of the present interest and concern of industrialists in the educational situation, casual observation might be led to think that the problem and its solution lay solely between industry and education.

This, of course, is not so. For education is the responsibility of all segments of our society. Industry as one segment of the community has an interest in all phases of education, most directly in technical and scientific education.

Industry is a natural profit company which fails to maintain the quality and quantity of its manpower is going to be at a sharp competitive disadvantage. And any nation which fails to maintain its quality and quantity can expect to be handicapped in international competition.

Canada has so far maintained its supply of technical and scientific manpower by immigration. This problem is not, as many thought, nearly as crucial for industry as it is for the community-at-large. The problem may not be so much, "Will industry get its trained people?" but, "Will Canadian boys and girls be equipped to compete for the highly-skilled work in industry, or will they have to take lower ranking jobs?"

So perhaps the real question here is whether education is providing industry with skilled help, but whether education is fitting the young for life.

If this proposition is accepted, the basic questions in education boil down to two: Is our educational machinery teaching the right things to the right people in the right way and so fulfilling its duty to the community? Is the community providing education with the bricks and mortar, the money and manpower necessary to fulfill its responsibilities?

Here is what one authority has said on the subject:

"We must not teach to sight, but to see," the nature of education and the proper means of imparting it. For at present there is a practical question on this point: people do not agree on the subjects which the young should learn.

Nobody knows whether the young should be trained at such studies as are merely useful as means of livelihood or in such as tend to the promotion of virtue or in the higher studies, all of which have received a certain number of suffrages. Nor again, if virtue be accepted as the end, is there any agreement as to the means of attaining it.

Those, of course, are the words of Aristotle, and his appraisal of the situation 2,500 years ago touches almost every point of disagreement and concern that is being expressed today. So if we find today a great deal of criticism about educational methods and objectives we need not feel alarmed. Educational controversy is hallowed by tradition. The community where there is unanimity on education is an intellectually dead, and probably an economically static, community.

The educational system is charged with four basic responsibilities—preparing its people for earning a living, developing their character, nourishing their intelligence and passing on to them the cultural traditions of the community.

There is a great deal of scope for discussion of conflict and method in all of these objectives in any democratic community. In one like ours where technology has changed so rapidly, where teachers brought up in an age that was only beginning to learn about radio have to teach children who were suckled on television, controversy becomes almost mandatory. At its worst, controversy implies a choice; at its best it may lead the way to constructive solutions.

That constructive solutions are needed is beyond question. Take that most important educational aim, the development of character, for example. Only recently a U.S. Senate Committee on juvenile delinquency announced that many delinquents were active and successful participants in team sports and other group activities. This is an amazing and truly shocking discovery. And while it would be dangerous to leap to conclusions, two possibilities suggest themselves—one is that the delinquent athletes may have suffered from a system which stressed the teaching of athletics rather than sportsmanship. The other possibility, the extent to which group activity can conceal rather than cure character deficiencies, is also fundamental.

In the same vein, a spot check on failures at an Ontario university showed almost as many failures among the top group as among the lowest when the students were divided into three groups according to IQ. Here was a clear case of lack of motivation—lack of character, our grandparent's grandparents might have called it. After 20 years or so of living and more than a dozen years of formal education, these youngsters, the brightest of the lot, had not learned to accept the discipline of serious study.

It's hard to say which of these revelations is the more alarming, that of the clean-cut athletic young delinquents or of the intellectuals who couldn't pass exams. Both reflect adversely, and in the highest degree, on the character of the homes that bred these youngsters, the communities that reared them and the schools that taught them. When such things can happen, education from the standpoint of character development apparently leaves something to be desired.

And what about education's responsibility in the preservation of the country's traditions and culture? Business and industry would agree that here is one deficiency—the imparting of a knowledge of our economic system and how and why it works.

Let us not underestimate the importance or the difficulty of this task. Only a fraction of that portion of our population which attends universities receives sufficient instruction in economics to be adequately prepared for the handling of economic issues.

If the total of those who have gained a sound grasp of economics through schooling or self-teaching runs to more than one or two percent of our population it would be surprising.

This may have been satisfactory in an earlier age when it was easier to pick up the economic facts of life from personal observation. The concept and motivating power of profit and loss were more apparent in the more simple and smaller rural economy.

The size, scope and apparent permanence of modern industries create the illusion that it is inevitable, that it will continue to do what is done regardless of the conditions imposed upon it. Actually modern industry operates on an exceedingly slim margin compared with what prevailed in earlier days, especially when uncertainty is taken into account. Because of this, and because of its size, the stimulus of profits and competition are even more important than they were in Adam Smith's day.

Yet these basic economic principles are very difficult to learn unless they are learned in school. So are the basic principles that must be grasped in order to maintain the health of a democracy. And industry, new processes, such as those resulting from automation, emphasize the need for stressing basic principles in education.

With regard to the stimulation of intelligence, it has been claimed that visual stimuli are most effective on the playing field, intellectual superiority is played down in the classroom, and on the report cards. To the extent that this is true, here too is a fundamental shortcoming.

By the remaining yardstick, the educational function of equipping the young to earn a living, our system, at least on surface, appears to be doing extremely well. Judged by the standard of living which they have attained, Canadians are well equipped to earn a living. But much of the technical progress on which our living standards are based has been made possible by imported brains and imported equipment. The current expansion in our technical, vocational and scientific teaching facilities will do much to improve this situation.

To summarize—there appears to be serious deficiency in our educational processes, using the term in its widest sense: in the development of character, in the preservation of the intellectual basis of our society and in the stimulation of intellectual development. Canadians are earning good living, but it is doubtful whether as many of them as should be are being fitted for tomorrow's responsibilities.

What are the answers to these questions? More education, that is, a longer period of education? While there are undoubtedly many people who do not get as much schooling as they could advantageously use, the present educational course from kindergarten to university graduation is already very long. Any tendency to extend it further—by resorting to more postgraduate training, for example—is of questionable value.

The community needs the services of its most intelligent people and any unnecessary extension of their schooling period represents a real sacrifice.

There is also evidence that some of the less intelligent youngsters, under the present compulsory educational laws, are staying in school longer than their interest and or achievement would justify.

So from the points of view of both the brilliant and the dull, a shorter and more intensive educational period seems desirable. This calls for a better, perhaps more realistic appraisal of the intellectual potentialities of students, and greater flexibility of curricula to develop these potentialities.

Far more important than either of these factors, however, is that if we are to intensify the educational process, we can only do it by intensifying the desire for learning. Motivation is the answer. Motivation of students to learn, of their parents to have them learn, of teachers to teach and of the community to provide the facilities for teaching and learning—is the crux of our educational problem.

And in all this, for what should we look to the educator? At every teacher knows, we look to them for a great deal, far more than we have a right to do, perhaps. But in the present situation what is the most valuable thing the educator can give is leadership. The great need now is for constructive direction and leadership.

This leadership must come from those in the educational field because without their lead the problems we face cannot be solved. Particularly is it important to hear more from the practising teacher—the person who knows from hard experience what can and cannot be done for the youth of Canada.

The great increase in the public interest in education, already reflected to a considerable degree in governmental actions, creates an opportunity that may not soon recur. What we make of this opportunity will depend greatly on the extent to which we receive from those who know most about education—
HER FUTURE'S ON ICE
by GORDON WISLEY

Once December day 13 years ago, a well-handled five-year-old girl took her first faltering steps on her first pair of skates on a Toronto backyard rink.

Last February the same girl, now a well-proportioned young woman with shoulder-length blonde hair and a contagious smile, stepped confidently on the ice in Colorado Springs’ posh Broadmoor Ice Palace. For five minutes she and a slim, handsome youth swooped and spun across the slick surface, climaxing their routine with a daring shoulder-high knee-catch. Applause roared from the stands as skating-wise spectators anticipated the judges’ decision—Canadians Barbara Wagner, 18, and Robert Paul, 19, were the new world’s champion pairs figure skaters.

If tears were seen to glisten in Barbara’s hazel eyes, there was good reason. The seemingly effortless performance by the two young skaters was the product of thousands of hours of rugged rehashing. Their easy-looking physical harmony was the result of a regimen that would tax a professional fighter. For six years they had dedicated themselves to skating.

But then, had they been few parties because there wasn’t time, no skating because she might injure herself, no swimming because it tends to over-relax skating muscles, no sunsets because skaters must watch their weight.

Nor were Barbara and Bob the only ones to have made sacrifices. Barbara’s father, James H. Wagner, a senior member of Imperial’s public relations department, had shown his faith in his daughter’s ability by spending thousands of dollars for lessons and equipment. A 15-minute skating lesson costs $3.25. Skates and boots are worth $140 a pair and Barbara wears out a pair in nine months. A two-month stint of summer-skiing in Schumacher, Ont., costs him $900 every year.

But Jim, an immensely proud father, shrugs off these expenses. “Our car is three years old,” he says with a smile, “and maybe we could spend the money on new furniture. But we press on this way. Any parent with a talented child would do as much, and after all, doesn’t any other parent do as much, say when he puts his child through medical school?”

What of Barbara? Does she sometimes long to be a normal teenager? For her, has the sacrifice been worth it? If that five-year-old in the Wagner backyard had known what was in store for her, would she have exchanged her skates for a doll-house?

“I would have chosen to skate,” says Barbara. “Anything you have to do continuously—like skating or golf or even business, I suppose—you get tired of sometimes. But deep down you have to love it or you wouldn’t be able to continue."

And there’s another side to it. "Look at all the things my skating has brought me," she points out. "I’ve crossed the Atlantic twice. I’ve skated all over North America and traveled all over Europe. I’ve been entertained in palaces and met all sorts of fascinating people. I have friends all over the world."

Barbara’s natural cheerfulness and her keen zest for living have stood her in good stead on her travels. At the 1956 winter Olympics in Cortina, Italy, her off-the-ice activities won the hearts of the Italians. Speaking a sort of pidgin Italian, Barbara, dubbed "Leelee Mees Canada" by the Italians, spent her off-hours wandering through the village’s picturesque streets, chatting with newboys about the day’s headlines or picking up interesting items about the town’s history from the Cortina town clerk. Her energy astounded everyone. In her two weeks in Cortina, she visited every church and historical site within a five-mile radius. The Canadian Press described her as "one of Canada's top goodwill ambassadors.""Oddly enough, neither Barbara nor Bob particularly wanted to win the Olympic gold medal that year. They wanted to see another Toronto couple, veterans DuCo and Norris Bowden, crowned champions. "Fanny and Norry are retiring at the end of this year and it will be a shame if they don't win," said Barbara before the competition. As it turned out, the Bowden-DuCo team lost out to an Austrian entry, Schwartz and Oppelt, Barbara and Bob placed sixth, then went to Garmisch-Partenkirchen, Germany, for the world championships and finished fifth—and that was the beginning of their climb to the top.

“We knew 1957 would be their year," said Coach Sheldon Gilbreath, 34-year-old professional at the Toronto Skating Club. It was indeed their year. All in the month of February they won the North American pairs title at Rochester, the Canadian pairs title at Winnipeg and the world pairs title at Colorado Springs.

Now they have their sights fixed on the 1960 Olympics at Squaw Valley, California. For the next two and a half years, they will dedicate their time and energy to preparing for that single five-minute performance that will decide their right to be Olympic champions. At least until they get a chance at the Olympic title, they will remain amateurs. They will defend their various titles and give occasional exhibitions to keep themselves in top condition. After the Olympics—who knows? "Maybe," says Barbara, "if neither of us is married and there are good offers, we'll turn professional." But that's a long way off.

Barbara’s story properly begins when she was taken to ballet school at three and a half with a natural responsiveness to music and her long golden curls, she was an immediate success. But her parents soon decided she had had enough. "I didn’t want her to have her life traveling around as a ballet dancer," says her father. To which Barbara laughs, "Look at me now!"

Discarding her ballet slippers for skates, Barbara taught herself to stay upright in short order. At nine she joined the University Skating Club in Toronto, but soon found that Saturday
Barbara and Robert in a death spiral. It will be part of a five-minute performance on which their fate at the Olympics will depend.

mornings were not enough. She moved to the Toronto Skating Club and in 1951, without ever having had a professional lesson, she won the club championship for girls under 12 years old. The next year she took two junior titles and, with a young lad named Robert Paul, was runner-up in the junior dance competition.

Compared to Barbara, young Bob had got off to a pedestrian start. He had reached the ripe old age of nine when his parents bought him a second-hand pair of figure skates so he could keep up to a young girl cousin. The next year he contracted polio—luckily, a non-paralytic type. While recuperating in hospital, he told his family, "When I get out of here, all I want is a nice new pair of skates." He got his skates.

Meanwhile Barbara's progress, largely self-taught, was not going unnoticed. Sheldon Gallbraith, who had coached Barbara Ann Scott to her world and Olympic titles in 1948, saw her possibilities and convinced her parents that she "should skate." The Wagners talked. Mrs. Wagner argued that Schumacher was almost 500 miles north of Toronto and Barbara was still a little girl. Jim Wagner objected—after all, he said, there was more to life than figure skating; she should be playing tennis and swimming and doing all the other things girls of her age were doing. Barbara broke down all arguments in typically feminine fashion; showing her usual determination she went until her parents agreed to at least have a look at Schumacher.

Barbara was a little taken aback by the frontier appearance of the mining town. Still she was pleased with the Mcintyre arena with its three artificial rinks and other recreational facilities, all built primarily for employees of McIntyre Porcupine gold mines. Gallbraith assured the Wagners that their daughter would be well-chaperoned and cared for and they headed back to Toronto minus their skating daughter.

At first Barbara did nothing but figure skating. But she was short—she's only five feet one inch today—and Gallbraith thought it might lengthen her stride and improve her technique to pair her with Bob Paul, who is now six feet and weighs 175 pounds. So well did they perform together he decided to train them as a pair and the following spring—1954—they won the Canadian junior pairs title at Calgary. Obviously, they were naturals. As Gallbraith put it: "Any weakness one might have is corrected by the other. Barbara has the grace and expression and Bob has the muscle power."

In 1955, now seniors, they were runners-up to Dufour and Bowden in the Canadian championships held in Toronto. That same year Barbara and Bob ventured into even deeper waters, competing in both the North American championships at Regina and the world meet at Vienna. Now that they had any hope of winning, but their coach deemed it important they gain international competitive experience. So good an impression did they make that they were invited with other Canadian skaters to give exhibitions in Davos, Lausanne and Zurich in Switzerland; Paris, France; and several North American cities.

Psychologically, the youthful stars have now reached a crucial point. "Right now," says Gallbraith, "they're going through their worst period. They would like to let up because there's not the same incentive. There are times when there's nothing left but will-power."

Sheldon seldom lets up on their training, driving himself as hard as he drives his pupils. Skating around the pair in lazy circles, he calls out, "Now!" for the timing of a lift, and then, "Feel it now, feel it!" Sometimes he will signal for the music to be stopped, show Barbara how he wants her to do a split and tell her to try again with the half-serious warning, "Three thousand of those and you'll have it right!"

Even if they wanted to, Barbara and Bob are usually too out-of-breath for repartee. In a sport in which temperament—and temper—is accepted almost as the norm, these two are noted for their serenity. The pair avoid seeing too much of each other off the ice because, as Barbara says with typical good sense, "We've seen too many pairs go down the drain because they let themselves get emotionally attached." Besides, she says, they have different off-ice interests.

Barbara has developed a highly effective method of avoiding temper outbursts. When she finds herself becoming angry, she simply turns her back and walks away. "I can't see any point," she says, "in saying something you'll regret later." Her charm and even disposition have won her friends all over the world. Almost every day letters and requests for photographs arrive from some distant corner of the world, usually from people she has never met. Some are addressed simply, "Miss Barbara Wagner, Champion Figure Skater, Canada." She makes a point of answering all her fan mail and carries on a regular correspondence with two girls in Lausanne, Switzerland. Fame she finds very pleasant. As for the crowds who regularly turn up to watch her skate: "The more the merrier—I love them!"

She admits to one superstition—the number 13. When she started school, she came home with a 13 for her mother to sew inside her coat and she was graduated from St. Clement's girls' school last June 13. In most competitions she manages to find a 13 either on a hotel room or a street number. Always on the watch for her lucky number, Barbara was happy when she found she had been assigned No. 58 in the world championships at Colorado Springs. "After all," she points out, "eight and five make 13, don't they?"

An avid reader—she prefers modern fiction—Barbara regrets her career allows no time for university. Last year she began a course in fashion design, her favorite hobby, but her skating forced her to drop out. Her skill in dress designing has not been wasted—she usually designs her own skating costumes and her mother sews them, a major economy.

Naturally thrifty, Barbara does her best to hold down expenses. As a world champion, she has most of her traveling costs paid by the Canadian Figure Skating Association. Earlier trips to competitions, however, were financed by her father. When Barbara competed in the world championships in Vienna in 1955, her mother went with her as chaperone—and Jim Wagner footed the bill. Last year Jim took advantage of a month's holidays to take his wife and 24-year-old son, John, to Italy and Germany to watch Barbara skate. "It was expensive," he smiles, "but worth every cent of it."

As far as expense are concerned, Barbara and Bob seem to be over the hump. At a reception for the pair at the Toronto Cricket Skating and Curling Club last March, both were presented with life memberships, to which Barbara reacted with unbridled enthusiasm. "Just think," she bubbled happily, "I'll be able to skate free until I'm 90!"
Using Eskimo carvings as "actors" and a weirdly-pitched Yugoslavian flute for background music, Crawley Films Ltd. has produced an unusual color movie for the Imperial Oil film series.

Entitled The Legend of the Raven, the 15-minute film draws on Eskimo art, music and folklore to tell an authentic legend of the Arctic. The story combines drama and a moral—how a raven is defeated by his own greediness and banished from the society of men and birds. The stone carvings set against a vivid Arctic background are fine examples of Eskimo sculpture. Plaintive songs recorded in Baffin Island and passages spoken by an Eskimo in his own tongue add further authenticity. On film, an old Eskimo legend comes to life, to captivate modern audiences and preserve an example of Canada's most ancient culture.

The film grew out of discussions between Judith Crawley, a private film producer, and James Houston, an officer with the Department of Northern Affairs and an expert on Eskimo art. Together they assembled the "cast"—carvings borrowed from the Canadian Handicrafts Guild and from private collectors. After choosing a legend best suited for illustration, Mrs. Crawley went to work on the script. For hours at a time she sat in her Ottawa office surrounded by carvings—turning, tilting and manipulating them. "People thought I was playing with dolls," she recalls.

By February 1955, the script was ready for shooting. The selection of a narrator was of vital importance. At first it was felt that the story should be told by an Eskimo or a Chinese (the Chinese have much the same tone and accent). But after a series of tests it was decided that an Eskimo twang might tend to distract viewers. Finally Tommy Tweed, a Toronto actor, was chosen.

The task of composing appropriate background music fell to William McCauley, Crawley's musical director. After experimenting unsuccessfully with conventional instruments, McCauley chose a Yugoslavian double flute. He found that by blowing very lightly and holding the flute close to the microphone he could produce a sound almost identical with that of a howling wind. By an elaborate system of pre-recording, McCauley accompanied his flute on an Eskimo drum. The Eskimo songs—chants, really—were made from recordings borrowed from the National Museum. "It's an experimental film in the truest sense," says Mrs. Crawley, "and we weren't sure anything was going to work until the final session."

The Legend of the Raven is joining a select company of Imperial films—The Loon's Necklace, Newfoundland Snow and The Seasons, all of which have won Canadian Film of the Year Awards. It will be available for showings this fall.

Once long ago, as sometimes happens in early spring, there was a hungry time for the Eskimo people. The migration of the caribou had not come. All the people were hungry, and so a man and his son left home and went in search of food.

At last they saw a raven, sitting on the barrier ice. In those days, of course, all ravens were able to speak like men. "Ay! Raven, have you seen any animals we could eat?" the man asked.

"No, I am starving myself. Just now I was dreaming of dead fish," replied the raven.

"You are higher than we are, Raven, and you are a good hunter! Will you tell us if you find any game?"

"I will," Raven answered, and flew off. After he had flown for a long time, thinking how hungry he was, the raven saw some walrus lying on the ice floe. In the past the raven had teased Avik the walrus because he was clumsy. Now the walrus looked at him scornfully: "Why don't you catch as if you're so hungry?"

The raven flew on, and spied Tergiak, the weasel. But he is the quickest of all animals, and when the raven swooped down Tergiak just laughed and scampered away.

At last, down on the tundra, the raven saw something he could eat—the egg of Okpik, the owl. Perhaps Okpik would be generous," Raven mused. "I am so happy to see you, Okpik," he said alighting beside the owl.

"Are you not happier to see my eggs?" queried Okpik suspiciously.

"Could you spare me one egg?"

"Try and take one!" Okpik challenged him.

"Just one egg?" coaxed Raven. Okpik just hissed at him. The raven flew off hungrier than ever. He saw Nanook, the bear, watching for seal by a crack in the sea ice—for he too was hungry. "Hey, Nanook!" he called. Nanook roared at him. Netsiauk, the seal, who was quietly sunning himself not far away heard the noise and slipped into the water.

"Have you no sense? Now you've frightened away the seal," cried Nanook in rage.

Far away, the man and the boy, who had found no game, were fishing through a hole in the sea ice. For a long time they were fishing, and the boy, who was not hungry, was still fishing, and the man, who was hungry, was still fishing, but no game came up. Finally the boy, who was not hungry, gave up fishing and the man, who was hungry, gave up fishing and they sat by the ice and waited for the seal to come by.

"First I will get my own food, then I will tell you," said Raven. Then he took one seal egg. He took a second egg.

"Raven—[said one]. Spare my children!" begged Nanook, the seal's friend. The Raven was greedy and paid no attention. He picked up the last egg.

"Raven. Where is the game for us?" shouted the hunters. Raven, with an egg in his mouth, answered: "Cawk, Cawk." He dropped the last egg into his bucket, turned to the hunters to speak, but—"Cawk, Cawk, Cawk.

"Cawk, Cawk, Cawk," was all he could say. Ever since that day, because of his greediness, all ravens have been cast out by the birds and have not been allowed to speak like men.
They're Beating The Pollution Problem

"Pollutocrats" are a product of the industrial age.
To keep air and water clean around refineries, these engineers use everything from teapots and plastic bubbles to microscopic phenol-eating bugs.

by FERGUS CRONIN

Just after the war a familiar sight on the St. Clair River, which carries Lake Huron water between Michigan and Ontario, was a converted lifeboat with a jeep motor. In it a tall, academic-looking man could be seen almost any sunny afternoon putting up and down between Sarnia and down-river ports. Periodically he scooped up samples of river water.

Later the tall sailor—by now recognizable as Alex D. McRae, then senior chemist and now Imperial's loss and waste controller—had the samples analyzed in the company's Sarnia laboratories. He also put them to a further and somewhat strange use: he made tea with them.

This was one of Imperial's early pollution-detection efforts. McRae, taking his cue from complaints heard in some of the river communities that the water occasionally made terrible tea, concluded that tea magnified the unpleasant taste of certain chemicals escaping to the river. So he made regular cruises in what Imperial engineers nicknamed The Fairy Smoggy, took samples, made tea with them and tasted it. Over a period of a year this somewhat primitive process—taste, plus chemical analyses—enabled him to identify the chemical culprits. Then, if they were coming from the Imperial refinery, he set about eliminating them.

At the time, the extent of the dangers and discomforts from pollution of the atmosphere and waters were just beginning to become known. In many parts of Canada, war-swollen industry and the sudden postwar growth of cities which multiplied chimneys, exhaust pipes and sewer outlets, all contributed to the tainting of air and water. Two incidents in which people were actually killed by smog—in Donora, Penn., and in London, England—introduced the element of fear.

It is natural that Imperial's own war on pollution should be centred to a large extent in Sarnia. At Sarnia is the largest of the company's nine refineries and most of its research facilities. As early as the turn of the century Imperial installed separators there to take oil out of refinery waste water. The surrender of Singapore in 1942 brought about conditions which eventually meant a large concentration of industries in Sarnia. The federal government installed Polymer Corp. there to manufacture synthetic rubber products to replace the supply of natural rubber which had been largely cut off. This in turn attracted other industries which either would supply Polymer or be supplied by it. The growing number of factories contributed to the pollution problem.

The situation in Sarnia is perhaps more critical than most because the city is located on an international waterway, and all such waterways come under the jurisdiction of the International Joint Commission. Composed of three Americans and three Canadians appointed by their respective governments, the IJC among other duties upholds the centuries-old common law that says a man is entitled to have water just as pure as that of his neighbor. In 1946 this commission began a five-year study of pollution of the waters linking the Great Lakes, The governments of the provinces and states bordering these waters are committed to carry out its findings. The IJC decided that the waters under study were contaminated enough to be a hazard to health and made specific recommendations for the treatment of municipal and industrial wastes and also decided that contamination by shipping and dredging operations should be eliminated.

But McRae did not wait for the IJC report before deciding something had to be done to keep the air and water pure. Although there was no legal responsibility, McRae and his superiors felt Imperial had a moral responsibility to be a citizen of the community. Subsequently Imperial pioneered in Canada many devices which contribute to the over-all anti-pollution effort and which have in many cases been copied by others. It was the first in Canada, for example, to make use of "micro-balloons"—tiny plastic bubbles which are injected into storage tanks by the millions. They rise to the top of the liquid and stop evaporation, thus preventing both loss of volume and escape of odors. Imperial also pioneered all-weather vents on storage tanks (the first to work satisfactorily in Canada's severe weather), smokeless flare tips and biological destruction of refinery phenol.

When Imperial's new $30 million refinery at Halifex was opened last year, it incorporated the latest and most effective counter-pollution measures as part of the capital cost. "With every new operation," explains McRae, "we plan the best possible waste disposal equipment." The new $26.5 million petrochemical plant being built at Sarnia will include the most up-to-date anti-pollution features costing up to $2 million.

But perhaps more important than the physical devices introduced by Imperial have been the co-operative systems of anti-pollution activity it has sponsored. With the Ontario Research Foundation, Polymer and the Dow Chemical Co. in Sarnia, Imperial pioneered in Canada the idea of a co-operative research
It was dumped into pits. The sludge—referred to by employees as "b.o." for bottom sediment—would not evaporate or sink into the ground; the pit filled up and another would have to be started.

Apart from the waste involved, sludge pits have a way of gobbling up valuable ground. At Imperial's Regina refinery, some five acres of land were being used for pits by 1952 when McAree decided something had to be done. Why not pour out the mud to recover the oil, then dry it, and get its valuable hydrocarbons safely disposed of? It sounded elementary, but no one had ever done it before. McAree and his associate engineers had to start from scratch.

They tried filtering, but that proved too slow and expensive. They tried turning it into pellets and burning it, but that also was unsatisfactory. Someone suggested centrifuges, and William R. Ross (now technical superintendent at Winnipeg refinery) visited several centrifuge companies in the U.S. looking for the right type. In 1954 they had devised a system for putting the slurry (oil and other wastes mixed with water) through two centrifuges—similar to spin dryers in their action—and were able to extract about 90 percent of the oil. The residue was burned in a three-storey incinerator to an oil-free ash which usually ends up as building-site fill. After-burners attached to the smoke stack are operated by an electric eye which turns them on when the smoke is too dark, burning up incompletely burned particles and making the smoke almost invisible.

McAree's primary aim was to get rid of the waste solids so they would not be objectionable to the community in any way. The plant eventually cost in the neighborhood of $500,000—but it provided an unexpected bonus for the company. The value of the oil removed from the waste granted the plant to operate at a slight profit; eventually it will pay for itself. The Sarnia waste disposal plant runs 24 hours a day and recovers oil worth about $35,000 a year. Other very small plants have since been built at Halifax, Montreal, Regina and Edmonton refineries, and another is rising at Calgary this year.

Though there have been cases where anti-pollution measures have produced salvable waste, Imperial's management plans anti-pollution measures first, then looks at its salvage value. In most cases there isn't any.

Take Imperial's "biological oxidation" program at Sarnia, for example, by which phenol—carbolic acid—is removed from refinery waste water before it flows into the St. Clair River. Until a method was devised for inducing microscopically-organized bacteria to consume phenol and convert it into harmless substances which will not contaminate water, Imperial had been burning phenol at a cost of almost $3 a pound. Now some 500 pounds of phenol are destroyed daily for about six cents a pound.

Not all the company's innovations have proved successful, notably its efforts to burn used lye, a by-product of the oil cleaning process. Imperial spent thousands of dollars trying to develop a furnace which would produce the necessary high temperatures to burn the lye without dissolving the firebrick, and just as it was about to give up, it found a market for the lye. A company in New Jersey now buys all the spent lye Imperial can supply, and at the price it pays just about covers the cost of collecting and shipping it.

On one occasion TV fans in Sarnia had reason to regret Imperial's innovative. Suddenly their television sets were plagued with a new type of interference, as if the man next door was using a defective electric razor all over the place. The interference was traced to small motors in equipment McAree had distributed about town for the purpose of measuring the amount of dust in the air. The motors were changed and Sarnians returned to undisturbed TV.

McAree and other pollution experts—who sometimes call themselves "polleutores"—hope that by good housekeeping and cooperation with municipal and government bodies they can prevent a repetition in Canada of what happened in Los Angeles. There the smog problem has been steadily increasing for years. Finally, he acted on the assumption that industry was the culprit, the city passed a set of stringent laws which included an edict to the oil refiners to remove sulphur dioxide from their fume gases. Some $10 million was spent towards this end, but the smog continued. Then the control authority concluded that sulphur dioxide might actually act as a counter-irritant to ozone which is manufactured by the sun's rays acting upon improperly burned fuel particles in the air and frequently producing tear-gas effects. But it was too late; the oil companies were by then removing 80 percent of the sulphur dioxide and finding it profitable to market the recoverable sulphur.

Though industry is often the obvious and natural target for pollution charges, Dr. Raymond Hess, a U.S. pollution expert, pointed out that $35 million had been spent by industry in Los Angeles for pollution abatement equipment before it was realized that the public was a major contributor to the smog.

Los Angeles reached the painful conclusion that two of the principal causes of its befouled air were traffic and household incinerators, of which there are about a million in back yards. Nothing has yet been done about the home incinerators, which contribute as much to the polluted air as motor traffic, and nothing can be done about the automobile exhaust until someone invents an efficient after-burner which will convert traffic fumes into harmless gases.

City sewage is often an important factor in water pollution. The J.C. gave equal emphasis to the roles of city sewage and industrial wastes in river pollution. In Canada few cities have sewage treatment plants, which extract from sewer effluent any materials which would overburden the recuperative powers of
the waterways. A dramatic illustration of the role played by city sewage in pollution was provided in Cleveland where an oil company began operating a new refinery shop separator. This equipment separates most of the oil from water used in the refinery. The water then runs through a city sewer line which passes through company property, and into an oil skimmer. The company calculated that about 22 barrels of oil per day were escaping from the separator, and expected to pick up almost that amount by skimming. But the skimmers consistently picked up 25 barrels a day. The only explanation was that at least three barrels of oil per day were being recovered from city sewage.

Imperial’s leadership in the field of oil and refinery anti-pollution has received international recognition. Its plants have been visited by industrial experts and university officials from the U.S., England, France and Germany. It has also given McRae an international reputation. This, of course, adds to the hours he spends on trains and planes. Apart from holidays, he spends two months of every year away from his office.

“The fight against pollution is a never-ending battle,” he says. “We’ve filled the holes and now we’re plugging the cracks. But we never seem to reach the point where we can sit back and say everything is perfect.”

But some measure of the extent to which McRae and his associates have gone to “fill the holes and plug the cracks” may be gained by Imperial’s expenditures for anti-pollution measures over the past decade. From 1947 to 1956 Imperial refinery spent about $6 million and expect to spend a further $11½ million a year from now on. About four to five percent of the cost for any new refinery project will be for pollution control.

In addition to the refinery’s efforts, Imperial’s marketing department over the same period spent $1.3 million to combat pollution. And in western Canada the producing department recently spent $9½ million on facilities to dispose of the salt water which is taken out of crude oil.

Behind all these efforts is the unceasing activity of men like McRae. He visits all refineries at least once a year to acquaint refinery managers with the latest findings and information on efficient waste disposal and anti-pollution measures. He keeps in touch with other pollution experts through technical publications, by attending conferences and symposia and by maintaining membership in special waste disposal groups and committees. He is chairman of the sub-committee on solids waste disposal of the American Petroleum Institute and a member of the Canadian Institute on Sewage and Sanitation.

When the Canadian Manufacturers’ Association presented a brief to Ontario’s air pollution committee last year it called on McRae to head the committee which prepared it. He is a member and past chairman of the St. Clair River Research Committee, which, with the support of large companies in the district, sponsors a continuing survey by the Ontario Research Foundation on pollution problems and possible solutions. He is also a member of the Sarnia Smoke Abatement Committee, chairman of the Smoke Abatement Sub-Committee of the Canadian Standards Association, and a fellow of the Chemical Institute of Canada, for whom he reviews manuscripts on pollution and delivers occasional papers at his own instigation.

“I’m so deep in the subject of pollution,” he admits, “the men at the plant sometimes accuse me of being ‘stop-happy’.”

Idea are swapped and many problems solved at round-table conferences

Algonquin’s GROUNDED EAGLE

TIME ANIMALS in Algonquin Park, 200 miles north of Toronto, are known for their tolerance of the humans who invade their 2,750-square-mile domain. They have even become accustomed to an elderly but robust man who roams about 5:30 a.m., summer and winter, and runs with determination along the park road.

George Phillips, the hearty and gruff-faced 64-year-old superintendent of Algonquin since 1944, has been keeping in top physical shape all his life. Since 1955, however, he has had an additional reason for doing so: he wants to show medical science how wrong it can be when it pays too much attention to a machine and too little to the subject being tested.

Two years ago, due to an abnormal electrocardiogram, the Department of Transport withdrew Phillips’ pilot’s licence. It was a bitter blow to Phillips and the end of a flying career—he has spent 14,000 hours aloft since 1927—which has made him a bush-pilot legend—among the north country with eyes sharp enough to tell a camper from a poacher at two thousand feet, landing a float-plane on lakes most other pilots considered inaccessible in order to pick up a hospital case, or doing aerobatic the plane manufacturers didn’t know were possible. Like a captive eagle, he is still fighting, trying to convince the Department of Transport that he grounded a pilot on the strength of an electrocardiogram alone is not only unfair but foolish.

Imperial Oil Review, October 1957
In 1931, 771 hours on mercy flights and fighting fires saw Phillips the McKee trophy for an "outstanding contribution to aviation."

To a DOT official he wrote: "There have been as many known crashes caused by pilots choking on their false teeth as from heart attacks. Yet, all pilots with false teeth aren’t grounded." Phillips' adventures started early in World War 1 when he joined the flying in France as a machine gunner, became regimental boxing champion, was a casualty of mustard gas, became a corporal and then a lieutenant, was mentioned in despatches and, after 26 months in the trenches, applied for transfer to the Royal Air Force "to get out of the mud."

He became part of an international corps called the Independent Air Force whose sole purpose was to retaliate for German bombings of London. Their first assignment was to bomb Berlin but while still organizing in France the war ended. Phillips had put in 60 air hours training as an observer and arrived back home at his father's farm at Laurel, near Orangeville, Ont., still without having learned to fly. "They told me then and they've been telling me ever since—that's about 40 years—that I'm too old to fly," he says with a snort.

In 1921 he became a charter member of the Canadian Air Force and has what is believed to be the only known CAF observer wing. In the spring of 1924 he heard that Ontario was forming a flying service so he applied for a job as pilot. Again being "too old" at 30, he was hired as an observer. Four years later, however, he was sent to Camp Borden and earned his commercial licence after less than 10 hours solo.

Soon after he was chosen for one of his oldest jobs: flying in circles over north Toronto to determine the endurance of a Gypsy Moth. The answer was a sad one because it proved that Lt.-Cdr. H. C. MacDonald who had taken off from Harbour Grace, Nfld., two days previously in an attempt to fly solo to England, could not have kept his Moth aloft more than 25 hours. These were still the brave, early days of flying and Lindbergh's 1927 flight from New York to Paris was still a miracle.

He became superintendent of eastern flying operations of Ontario's Provincial Air Service and, in 1931, because of his service in mercy flights and fighting fires, he was awarded the McKee Trophy, given annually through the Minister of National Defence for outstanding contributions to aviation in Canada. That year was bad one for fires in the Sault district, where Phillips was stationed, and he flew 771 hours between May and October. In July alone he flew 202 hours, not a single day that month without at least one flight.

In fighting forest fires the ability to land and take off from tiny lakes in order to get firefighters to a blaze in its early stages often means the difference between a spot fire quickly extinguished and one that spreads for miles before it can be controlled. Phillips habitually landed on lakes which pilots of smaller and slower planes shunned. His secret was in side-slippping. Even when it wasn't necessary, Phillips would land this way, and the practice made it easy for him to do it.

A charter member of the Canadian Air Force, he owns a CAF observer wing believed to be the only one in existence.

Bruce West of the Globe & Mail once wrote in his column after a flip with Phillips: "There are some who claim that George could get an airplane in and out of a medium-sized tub of water. Personally, we think this is an overstatement. It strikes us that Phillips would really require quite a large-sized tub of water if the wind didn't happen to be blowing in just the right direction."

To better fight fires from the air, Phillips invented a rotating tank for each float which is filled by a water scoop as a plane is taxiing on a lake, and allows a pilot to dump 80 gallons at once on a blaze instead of perhaps 20 water bombs containing five gallons apiece which must be scattered singly.

By 1934, when he was appointed district forest officer in the Ontario Department of Lands and Forests with headquarters at the Sault, he was Canada's best-known bush pilot. Many a trapper, vacationer and rafter owes his life to Phillips' readiness to pop off and bring in a hospital case. On one occasion a critically ill woman was marooned on Cockburn Island at the north end of Lake Huron because the ice in ports was not thick enough to take the weight of a man. Just when hope was drying, Phillips roared in like an angel of mercy on a ski-equipped plane scouting to chance the ice in to hold the plane long enough to find out where she was. He chose a nearby field and then whisked her away to civilization and a doctor.

Probably his most spectacular rescue mission was in 1937 when he and another Ontario pilot, Joe Haven, flew single-engined flying boats to Nova Scotia, carrying rescue equipment to Moose River where one man had been killed and two others trapped underground for several days. They took off from an ice-filled river at the Sault and, although equipped with floats, flew straight across Maine in snow and fog to save time.

On August 31, 1939—a few days before the outbreak of war—Phillips volunteered his services to the RCAF, was accepted and became an instructor at Camp Borden, Ont. One of his most prized trophies is a letter written from a New York hotel in March, 1942. It reads: "Dear Pop: We whose signatures appear on the attached sheets wish to express our appreciation of your efforts on our behalf and the comradeship you have shared with us during our course. We all consider you a fine officer and a thorough gentleman and are proud to be able to say we were trained under you. The Australian and New Zealand fliers."

There followed the signatures of 26 pilots.

After about two and a half years at Borden, Phillips became restless and secured a posting flying planes across the Atlantic. His first flight was ill-fated. In October 1942, he started the hop from West Palm Beach in a Hudson bomber, carrying a navigator and wireless operator. The route was through Trinidad, Georgetown, Belize, Natal and Ascension Island, then to Accra on the Gold Coast.

On the final leg the radio went dead, the navigation was off, and by the time they hit the African coast it was getting dark. They had been told that if they were going to land at Accra after dusk they would have to give a half-hour warning by radio or run the risk of being shot down. Phillips decided the risk was too great and flew down the coast until he spotted an unlit strip at Cotonou in French West Africa. He started to set the plane down and too late discovered the runway was booby-trapped with steel rails. With a skill developed by dodging rocks and snags in Northern Ontario lakes, he guided the big Hudson through the rails. Both tires flew off and the plane skittered to a stop on her belly, relatively intact. The crew was promptly interned by the Vichy French forces.

Phillips became commander of a POW camp and maintained a continuous stream of vituperation against his captors, supplementing his high school French with slogans like: "Down with Hitler! Perain good old man, Lalal mold fou!"

After Phillips and his crew had been interned 10 weeks, the Allies took Casablanca and all prisoners in French African territory were released.
As park superintendent, George’s duties vary from the supervision of student rangers or handling of interns’ problems to reconnaissance flights.

When they got home Phillips’ navigator, William G. Campbell of Port Elgin, Ont., told reporters, “He could fly a washstand with a motor on it. How he ever got down without killing us I’ll never know. And never for a minute did he give up the idea of escape.” Later the Sault Daily Star commented: “His fighting spirit is an inspiration. On his return from Africa in one of the few addresses he ever made, he spoke sharply of the lack of spirit among prisoners of war and told of egging his companions prisoners into activity. His theory was that any action which caused the enemy grief was good for the Allies. ‘If you can’t think of anything better, push over their back houses,’ he stressed.”

Following his African adventure, Phillips’ final job of the war was as O.C. of an RAF Transport Command unit at Natal, Brazil, and during this period he flew another plane across to Africa, this time without mishap. On his return he was placed on reserve and appointed superintendent of Algomaquin Park.

His wartime trans-Atlantic adventures did nothing to diminish his zest for makapu flying. For instance, in 1922, a group of touring European air cadets were camped at Lake of Two Rivers in Algomaquin Park where Phillips was to demonstrate the Beaver and take them up, a couple at a time. Before he arrived the cadet instructor gave a talk on Canada’s famous bush plane, pointing out that in the north they were equipped with floats instead of wheels and the cumbersome appanages made aerobatics impossible. Then Phillips zoomed in and put his float-equipped plane through a loop and a roll. As he watched, the instructor turned to his charges and added: “Floats make it impossible for most pilots to perform aerobatics!”

Good pilot that he is, Phillips has had his share of airborne mishaps. His first was at the start when he tried too close a spot-landing on a frozen lake in a ski-equipped Gypsy Moth. At low speed on a turn one wing dipped and when he put the nose down to straighten it out, it hit the lake. “I almost got screwed into the ice,” he recalls. Ten stitches closed a gash over one eye, but otherwise he was undamaged. Caught in a snowstorm on another occasion he decided to land his plane on a lake which proved to be only 450 yards long. The skis sank into soft snow, one broke and the plane flipped up on its back. Phillips’ safety strap broke and he was catapulted out into the snow, the plane coming to rest gently on his chest. He was unhurt but the plane had to be dismantled and shipped out by freight.

A few years ago he was taking off with a canoe lashed atop one of his floats, destined for a gang of firefighters in the bush. The front end of the canoe broke loose when he was about 1,000 feet above the water, the canoe whirled sideways like a sail and two feet were shoved off by the whirling propeller. But he kept in the air long enough to circle the lake and come down for a safe landing. Phillips modestly says he was saved only by the extra straps on the canoe which his engineering partner, Red McCrea, forced him to put on. On another take-off the cockpit seat broke and he rolled onto his back on the cabin floor, but managed to scramble back to the controls just as the plane was roaring off the water.

Such incidents seem only to increase his love of the air and for the last few years his sole fear was that he would be grounded. So keeping in condition became a fetish. In the late fall, after an overnight snow, rangers have arrived at headquarters Phillips’ house to see his barefoot tracks in the snow leading down to his dock where he swims. Unless extremely bad weather prevents it, he jogs-rows “like a fox” both before breakfast and after supper. While he has his daily routine would include fireproofing, hunting wolves with a rifle, planting fish, looking for lost planes or tourists

Phillips passed on his love of flying to his two sons, Jack, shown with his father, is a squadron leader in the RCAF and giving visiting “VIPs” a hawk’s-eye view of the park.

Once he trained in a beech where a party of youthful canoe campers were having a contest to see who could walk farthest on their hands, and Phillips threw himself nimbly into a handstand and walked farther than any of them. In summer he would often land at a ranger’s cabin, go for a swim then take off again in his underwear and bare feet. Such unorthodox behavior has made him popular among newspapermen. One of them wrote: “George Phillips is the only one I ever knew who seems to use an aircraft in the same casual and confident manner that another man might use a bicycle. He seems to sort of hop on and off the plane and pedal around the park. Flying seems to come as natural to him as eating or walking.” Which if Phillips put his philosophy into words would just about sum it up.

But, in spite of all his protests and keep-fit regimes Phillips does not expect to get his license back. On August 17 he was 64 and, although he could wait until he is 70, plans to retire on his 65th birthday. And what will the restless eagle do with his time? “I’m going to run and swim with my grandchildren,” he says—he has 11 grandchildren.

He has passed on his love of flying to his sons. Both are pilots and served in the war. Jack, who is 34, is now an RCAF squadron leader at Trenton, Ont., and 33-year-old Alan is TCA supervisor of passenger services at Dorval. His daughter Margaret married another pilot, Bob Fowler, who is test pilot for De Havilland Aircraft at Toronto.

“Maybe I’ll build a home on my 100-acre farm north of Orangeville and become a country squire,” says Phillips. But even if he does become as earthbound as this, his heart will be in the air—soaring somewhere over Algomaquin Park.
MANAGEMENT CHANGES

MANUFACTURING PROMOTIONS

J. G. (Jim) Livingstone leaves the position of manager of co-ordination and economics to become an assistant general manager of manufacturing. He has a background of refining experience beginning in 1942 when he joined Imperial at Sarnia refinery upon graduation from the University of Toronto in chemical engineering. In 1944 he moved to the engineering division and in 1951 became its chief process engineer. Two years later he transferred to Winnipeg refinery as assistant superintendent. Later in the year he returned to his native Toronto as assistant manager of the co-ordination and economics department. He has been manager for three years.

S. T. (Stan) Reynolds formerly plant superintendent at Edmonton, has become manager of Calgary refinery. He replaces J. J. Hamza who retired after 35 years’ service at that refinery. Mr. Reynolds was born in England and studied chemistry and chemical engineering at the University of Saskatchewan. Upon graduation in 1955 he joined Regina refinery as a chemist. He served as chief chemist and, in 1947, transferred to the engineering division at Sarnia. He returned to the west in 1951 as assistant superintendent of Calgary refinery and the following year moved to Edmonton.

F. B. (Ted) Doull succeeds Mr. Reynolds as plant superintendent in Edmonton. He has been process superintendent of the lubricating plant at Edmonton. Mr. Doull attended school in Regina and Mount Allison University in New Brunswick where he graduated in chemistry. He joined Regina refinery in 1929 as assistant chemist. Four years later he went to Sarnia refinery and by 1940 was head of the operations analysis section which deals with lubricating oils, waxes and greases. He held that position until his transfer to Edmonton in 1954.

MOVES IN RESEARCH AND MARKETING

Bernard (Ben) Goulston has been appointed co-ordinator of technical services of the marketing department. He succeeds Gordon McIntyre who retired after 36 years’ service. Mr. Goulston graduated from the University of London in 1921 in chemistry. He joined Imperial’s Montreal East refinery in 1923 and three years later went to Peru with a former Imperial subsidiary. He returned to Canada in 1927 as chief chemist at Leduc refinery and transferred to Sarnia refinery nine years later. Since that time he has been chief chemist of the inspection department, assistant manager of the technical service division, and chief staff chemist and assistant manager, service laboratories of the research department. He held the latter appointment for the past three years.

L. F. (Len) Whitfield has succeeded Mr. Goulston. During the past six years he has been co-ordinator of the service section of the research department. Joining the company in 1927, he transferred the following year to Tropical Oil Co. in Colombia, then an Imperial subsidiary. On his return to Canada in 1939 he was loaned to Allied War Supplies Corp., which was engaged in ammunition filling, and later to the St. Clair Processing Corp. He returned to the company in 1947 and was with the engineering division four years before moving to the research department.

R. M. (Merv) Crockett has been appointed manager of the co-ordination and economics department. He joined Imperial in his native Calgary in 1947 to work on financial forecasting and statistical analysis. In 1949 he became assistant chief accountant for the western producing group. Less than two years later he was appointed head of the group’s scouting operations and held this post until 1953 when he moved to the land department as manager. Since 1955 he has been assistant manager of co-ordination and economics. Mr. Crockett is a graduate in business administration from the University of Minnesota.

J. W. (Warren) Flanagan, after a short period in charge of crude oil purchasing in Calgary, is now assistant manager of co-ordination and economics. Mr. Flanagan joined Imperial in 1946 as a chemist in the research department and two years later moved to Sarnia refinery. He was later refinery operations assistant in the marketing department, assistant manager of crude oil purchasing and management assistant in the transportation and supply department. He has his master’s degree in chemistry from the University of Toronto.

T & S DEPARTMENT RE-ORGANIZED

F. C. (Floyd) Lantz has become assistant general manager of the transportation and supply department. His appointment, a new position, is part of a re-organization to centre responsibilities for the company’s operating transportation and supply problems in one department. Bruce H. Mackenzie has taken over Mr. Lantz’s previous duties as head of the pipe line division and Luis Garcia, formerly chief engineer, succeeds Mr. Mackenzie as assistant manager. The re-organization also includes the appointment of W. D. Archbold as management assistant.

Mr. Lantz has been with Imperial for 35 years and has served at three of the company’s refineries, as refinery superintendent for an affiliate in Colombia and as chairman of the manufacturing technical committee. During the war he managed St. Clair Processing Corp., an Imperial subsidiary which assisted Polymer Corp. in the production of synthetic rubber. He returned to Imperial in 1946 as assistant general manager of refineries and three years later took over special duties in connection with the supply and transportation of crude oil and products. He became manager of the pipe line department when it was formed in 1951.

Bruce Mackenzie, a graduate in chemical engineering from the University of Toronto, joined the company at Sarnia in 1940. He was loaned to the St. Clair Processing Corp. in 1943 and returned to Sarnia refinery two years later. He co-ordinated the expansion and modernization program at Sarnia refinery in 1951 and in the following year moved to Toronto as chief engineer of the pipe line division. He now heads the division after three years as assistant manager.

Assistant Manager Luis Garcia comes from Puerto Rico. He is a graduate of the University of Michigan in mechanical and aeronautical engineering and upon discharge from the USAF at the end of World War II joined Transit and Storage Co., then an Imperial subsidiary. He transferred to Imperial in 1953 as assistant chief engineer of the pipe line division. For the past three years he has been chief engineer.

W. D. (Bill) Archbold transferred from the co-ordination and economics department to become management assistant. He is a graduate in economics from Princeton University and has also studied at Columbia and New York Universities. Prior to joining Imperial in 1951 he worked in operations for the

B. Goulston

L. F. Whitfield

J. G. Livingstone

S. T. Reynolds

F. B. Doull

B. Muckenzie

L. Garcia

F. C. Lantz

W. D. Archbold

B. M. Huffman

M. J. Huffman

Eco Standard Oil Co. and did statistical work for Standard Oil Co. (N.J.).

M. J. (Jack) Huffman has become manager of the crude oil purchasing division in Calgary. A native of Blaineau, Alta., he has been with the company since 1949 when he joined the western producing division as a production technician at Redwater. The following year he went to the scouting department in Calgary and later became assistant division scout and western regional scout. In January 1956 he moved to the crude oil purchasing division as assistant manager and held this position until his recent appointment. He succeeds J. W. Flanagan who has transferred to Imperial's executive offices in Toronto.
I SAILED THE NEW QUEEN OF THE TANKER FLEET

by HAL TENNANT

A new tanker arrived in Halifax.
It was the Imperial St. Lawrence.
It carried a crew of 50,
it's first load of Venezuelan crude
and two landlubbers to record the trip

The big, black outline of the Imperial St. Lawrence rose and fell, slowly and gently, beside the dock.

To the Spanish-speaking dock hands of Amayuy, who often see 200 tankers come and go in a single month, she was just another big floating bottle thirsting for a bellyful of crude oil. But as photographer Al Schoenborn and I made our way along the dock in semi-darkness, we saw her as something special. She was not only the largest tanker ever built for Canadian interests (length, 690 feet; deadweight tonnage, 35,500), but she was about to take us with her on her first voyage from Venezuela to Halifax. This would be a new carrier in a vital supply route—the route linking one of the world’s biggest oil-producing countries with that area of Canada which yet remains outside the economic reach of western Canadian oil producers.

The gangway was steep now, but it would be a lot steeper in a few hours, after the ship’s pumps finished unloading the water ballast from a compartment in the hull. We headed for the forward deckhouse, picking our way between the pipes and valves of the main deck, a great open space two-thirds the length of a football field, with an elevated catwalk linking the forward and after deckhouses.

My room, on one of the lower decks of the forward house, was marked Spare Bedroom “C” and looked more comfortable than many a hotel room I’ve slept in. It contained a steel bunk with storage below it, a tall chest of drawers, a steel wardrobe, a seven-foot settee and a full-sized writing desk. For ventilation there was an electric fan, an air blower and two port holes. Beside the wardrobe was a door leading to a private three-piece bathroom. Later I discovered this room was identical to those occupied by the ship’s 15 officers. Each of the 35 crewmen also had his own private room, but in some cases two or three shared a bathroom.

That evening and the next day, while we were still made fast to the dock, we got acquainted with some of the men aboard. They were all Canadians, and it was almost like being home.

At that time the busiest man aboard seemed to be the chief officer, 36-year-old John Matthews. As No. 1 man (after the skipper) and head of the deck department, he supervised the loading. Mostly he was out on deck, pacing nervously around, making sure the 33 steel compartments within the hull, extending almost from bow to stern, were each filled to exactly the right level. Otherwise the St. Lawrence would sag in the middle like a swayingbacked horse or “hog” up in the middle like a boat’s back. Nobody could see the crude oil as it came gushing aboard through two huge rubber hoses bolted onto the ends of intake pipes on deck, but Matthews took a peek at it now and then. Lifting the little round covers on waist-high, dome-like hatches protruding from the deck. By shining a safety flashlight into them, he could see what level the oil had reached in each compartment. But nobody needed to look inside to remember that this was crude oil, a valuable raw material when it’s under control and a dangerous foe when it’s not. There was no smoking on the main deck, either.
loading or after we were under way, and weekly fire drills were a regular part of the ship's routine.

All day Monday the loading speed, which depends mostly on the pumps and other shore installations, was slower than Mattews wanted it, and he kept revising his estimates of our departure time.

"How fast is it going now?" I finally asked.

"About 15,000 an hour," he said in his Nova Scotian drawl. He meant 15,000 barrels—which is 525,000 gallons.

"What's up for the course?" I asked.

"Well," he said, "I've loaded other tankers here at 28,000 to 30,000 an hour."

It was well after dark by the time those two tugs came swinging over and fastened themselves onto us to help us on our way. Once we were clear of the berth they eased us around very slowly until our bow was pointed in the right direction. Then two of them headed back to the dock, towing farewell as they went. The third tug stayed with us a little longer, waiting to take the pilot back since he had guided us to the open sea. From here we expected to cover the 2,010 miles to Halifax in four days and 22 hours.

By daylight it had been evident that Amery, terminal of the pipe line from the Lake Maracaibo oil fields, was a lonely seaport on a lonely spit of sand that pokes northward into the Caribbean from the western end of Venezuela. But now, through the darkness, it looked lonelier than ever, its tiny lights blinking out from the shore like clusters of fallen stars. Riding low in the water under the weight of her 250,000 barrels of crude oil, the St. Lawrence took a full hour to get her to her normal running speed of 17 knots. Life on the ship now settled down to a recognizable routine, making it easier for an outsider to see who was doing what and how.

CHIEF WAREHOUSING OFFICER, A DAYTIME WORK ROUTINE

Tjany landlord expecting to find the "Old Man" doing a Captain Bligh bit up on the bridge, the activities of Capt. Dollar Fourrier of Mount Royal, P.Q., would have seemed wonderfully undramatic. Not that his life has been devoid of drama, for his 25 years of service on Imperial tankers included wartime convoy duty that won him an O.B.E. But there was little drama in his daily routine. Dressed in khaki pants and a short-sleeved sport shirt, he was seldom on the bridge and left routine navigational problems to the second officer. His work was done in his office, which itself hardly seemed a part of the ship, with its thick carpet, big desk, built-in filing cabinet, wall-mounted electric fan and forced-air vent built into the ceiling. About the only shiplike things in the whole room were the photographs. It was in this room that he handled a dozen-and-
one different kinds of reports and records, read and answered company mail, prepared documents required by government health, marine and customs authorities, received and dispatched messages through the radio officer and dealt with other matters affecting his ship and her personnel. Captain Fourrier had no time to play Captain Bligh.

On our first night out, Matthews, the chief officer, got up at 11:50 a.m. and had his morning's work done. Then he put to bed and took his time to breakfast. He could have had someone else take over while he got it in some time in his bunk, but Matthews is not the type of man who can sleep with heavy responsibilities on his mind. Beginning with our first day at sea, he settled down pretty well into the routine.

KELLY AND SKIPPER, A DAYTIME WORK ROUTINE

power—enough power to electrify a small city—and devoted tanker fuel at the rate of 25 barrels (875 gallons) an hour. All told, they used up well over 100,000 gallons between Amery and Halifax. The fuel was used in water-tube boilers, producing steam that powered a pair of turbines. The steam acting on the turbine blades turned the rotor and propeller shaft, which of course turned the propeller. Other engine room equipment evaporated sea water and distilled it at the rate of 35 tons a day to provide the ship with working water, including our wash water. Drinking water came from a separate supply taken on in port. Our electrical power was yet another product of the engine room.

CHIEF STEWARD PORCH

O UR PERSONAL COMFORT throughout the trip depended mostly on the work of the nine-man steward department, headed by bully-go-round chief steward, Jack Proch. With 18 years' experience catering to tankermen, Porch is a bear for detail. He drew up the menus for every meal, with an eye to balanced diet, variety, weather, climatic changes and the quantities of food left in stores. He made sure his two cooks and six stewards did their work properly on time. All the while he was keeping track of every last ounce of food, bar of soap, piece of linen and box of matches, accounting to the company and preparing to resupply his stores as necessary. To make out a grocery list for the customary two-month period, he would jot down such items as 5000 pounds of fresh vegetables, 2000 pounds of meat and 900 pounds of flour. "We've got some pretty good eaters on board," he explained.

SHIP'S ENGINE ROOM, A DAYTIME WORK ROUTINE

EACH DAY, in a room on the top deck of the forward deckhouse, big, dark-haired Michael Kelly, an RCAF veteran with 10 years' experience as a radio officer on tankers, kept us in touch with the outside world. Working an eight-hour day spread over a 14-hour period, Kelly attended a row of radio units with a routine as impressive as its appearance. The main unit, a big metal box standing on a low counter along one side of the radio room, was a powerful transmitter-receiver for handling messages by International Morse. Beside it was a radio-telephone for close-range ship-to-shore conversations. An automatic unit, hooked up to the main receiver, was set to sound an alarm whenever an emergency signal was received.

THE AFTER DECKHOUSE, which contained quarters for officers of the engine room department and all the crew, the chief engineer, John Atkinhead, had his office. Like the skipper, Atkinhead had put in 25 years on tankers and was now mostly a desk man. Only occasionally did he climb down into the engine room—a huge, machine-filled cavern rising from the bottom of the ship to the height of a five-story building. Throughout the trip the engines generated 16,000 shaft horse-
T he man directly responsible for keeping us on our course was the second officer, Cee Ritcey, a short but husky man of 35 with a tanned and rugged face and a chompy haircut. Home, for him, was Riverport, Nova Scotia, and he had a drawl which, by comparison, made Matthews, the chief mate from Dartmouth, sound like a radio announcer.

How did Ritcey know where we were? Basically, he and the third and fourth officers, who relieved one another on watches, relied on the sextant, using it to shoot the sun or the stars—weather permitting. In cloudy weather they used the radar, the direction finder, the Lorcan, the echo sounder or a combination of these depending on circumstances.

The echo sounder, though primarily intended for helping them keep a healthy amount of water between the bottom of the hull and the ocean floor, could provide useful clues in navigating where the ocean’s depths were charted in detail.

The radar, as well as helping avoid collisions, was useful in general navigating whenever the ship was less than 40 miles from shore. Within this 40-mile range, the radar screen would record any obstructions, including a shoreline, by transmitting electrical impulses and then picking them up again when they bounced back.

In the open sea, where neither the echo sounder and radar were of little use, the direction finder or the Lorcan would be brought into play. The direction finder picked up a constant radio signal from a shore station. When a dial was properly set, the reading indicated the direction from which the shore signal was coming. From that, one of the officers could plot a line and know that the St. Lawrence must be somewhere along that line.

The Lorcan, developed during World War II, is a sort of super-duper position finder. It receives signals from two shore stations and establishes the ship’s position by recording the time difference between them.

Crewmen on deck... between choves, a seashore end of rest. There were repairs to be made in the engine room, and several engineers were busy at work all day Sunday. When we finally weighed anchor, soon after sunup Monday morning, it was like Amoy all over again—but in reverse. Three tugs came out, swung us around and pushed us alongside the Imperoyal dock, right below the refinery. Under a drizzle of rain, crewmen and dock workers joined forces to fasten our lines and hook up the hoses, and for several hours the tanker was a physical part of Imperoyal, pumping in enough crude oil to keep the refinery running at full capacity for six days. This, then, was where we are. As soon as her cargo was off, the Imperial St. Lawrence would take on a partial load of water as ballast, cast off her lines and head back to Venezuela.

It was a safe guess that almost every man aboard was imagining what he’d be doing if he’d had more time ashore. But these plans would have to wait for the next vacation, and meanwhile there was a job to be done...