REVIEW IN REVIEW

The New Newfoundland... Our peripatetic staff photographer Roy Nicholls seldom comes home without some new untried experience. There was the aerial photography assignment wherein the pilot unexpectedly did aerobatics, making our man too ill to snap a shutter. There was the time Nicholls, while washing his red woolen underwear in Innvik, wasbecked by Eskimo children, ("men don't wash clothes!" they scoffed.)

On his latest trip, to photograph the changing face of Newfoundland, Nicholls ordered seafood for his last meal. What could be more appropriate? But the waiters returned, grinning sheepishly. The hotel seemed to be out of fish. Nicholls settled for bacon and eggs, uneasily wondering if Newfoundland is changing even faster than his photos show.

Anybody Want A Pioneering?... Of the 394 written comments received on last October's northern issue (five times the normal issue's mail), one reminded us that employers as well as employees should re-evaluate their "northern state of mind." Our editorial and lead article asked: Are Norwegians afraid to "pioneer?" We aren't, replied Dutch immigrant Geert Penn and his English wife, but nobody will hire us.

Penn, age 20, is a chef; had four years' training in a Holland trade school; has worked for the CPR and Montreal's Ritz Carlton hotel; is now a cook at Macdonald College, McGill University. His wife is secretary to a company vice president.

Penn has tried for several northern jobs. ("We are both in good health and, though it may sound 'canny,' would like to do a little pioneering..."
Perhaps it is a little of the spirit that made us both come 3,000 miles from secure, well-established homes..."
But, he says, his applications have been rejected: once because he was too young; again because it was the "wrong time of year to go north" although he's applied during spring and fall. "Just how and when and where does one get the opportunity to go north?" says Penn.

Students Take Note... Although we checked facts right up until press time on the October issue (to verify two small points, we wrote to England and California), two errors slipped in. The many students who are using the issue for reference should make corrections on page 4 (longevity is being mined in Canada, in small quantities) and on page 15 (Resolute is not on the southern tip of Ellesmere; it's on Cornwallis Island, just south of Ellesmere).Northern Lights... For Montreal freelancer Lauschie Chadburn (see page 26) the most memorable moment in his aviation writing career came on the ground, at a northern radar station. The neighborhood Eskimos had obligingly built an igloo as a Christmas-party novelty for their tenderfoot friends. Chadburn scrambled through the doorway on all fours, feeling a little like Vildehammer Sturmannson, and looked about expectantly for seal oil lamps. The igloo was lit with an electric light bulb.

Vol. 45 No. 1 February 1961

Cover: Plywood buddled near Corner Brook, Nfld., caught Roy Nicholls' photographic eye. About a mile downstream is Bonavista, the world's largest integrated pulp and paper mill.

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Published simultaneously in English and French by Imperial Oil Limited, 111 St. Clair Avenue West, Toronto, Ontario. Editorial material may be reprinted without special permission. Credit lines will be appreciated. Authorized as second class mail, Post Office Department, Ottawa.

EDITOR: ROBERT COLLINS

IMPERIAL OIL REVIEW

The automation debate

As businessmen, laborers and scholars weigh the pros and cons of electronic "brains" and super-machines (see page 8), we sometimes find ourselves feeling a little sorry for the machine. Even some of its advocates support it with a reluctant "we can't stop it so let's make the best of it" attitude. In recent years the machine has become regarded as a new Frankenstein.

But, in fact, the process we currently call "automation" is neither new nor bad. It is simply a continuation of progress that began when man discovered the lever, invented the wheel and otherwise began to provide himself with tools to ease and improve his labors. It does not apply solely to electronic brains, but to an entire "toolbox" of better mechanical equipment.

At Imperial, for example, the net investment per employee in plant and equipment has risen from $16,704 in 1947 to more than $62,000 today. In other words, each employee is responsible for, or has available to him, some $45,000 more equipment. The object, of course: higher quality and greater efficiency. And this, in essence, is modern automation—part of the ever-improving productive process that follows from the invention and improvement of machines.

Most of us in Canada have benefited from this process. Most of us put in about half as many hours per week as our grandfathers did. Our standard of living is considerably higher. And we owe much of this well-being to man's mastery of the techniques of industrial organization (including machines) and to the subsequent provision of reproductive capital for further expansion of industry.

With most technological advances there is a possibility that some workers will be displaced, at least temporarily. This is true in the case of computers. Theonus is on all of us to see that workers are retrained or otherwise relocated. Imperial, for that matter, has for years maintained an on-the-job training program for plant employees. The very fact that we are increasingly concerned with the human element is progress itself. Years ago, workers displaced by the Industrial Revolution received little attention from society.

At present there are no signs that computers, like the men in TV commercials, will learn to think for themselves. And as long as machines continue to work for men, there is little to fear from automation.

by Robert Warren as told to Bob Fenner

The next 30 years will probably make greater demands on Canadian brainpower than any other period in our history. In that time, according to government and independent studies, we will have to build enough classrooms to accommodate twice the present number of students, expand our crowded highways to carry at least twice the present number of vehicles, and boost our water supply to meet the needs of an additional 10 million people.

By 1980 we will need three times as much oil and four times as much electrical power. This partial list of unfurled problems doesn’t take into account the space age, co-existence in the hydrogen bomb era and all the other challenges of this new civilization we have created.

If we are going to meet these challenges every last individual must use his mental capabilities to the utmost. There will be no room for freeloaders.

Which is why it disturbs me to have to report that one of the greatest problems facing educators today is the shocking number of mentally competent Canadian high school students who are getting disgracefully low grades. Even more disturbing, these students—known variously as “lazy,” “at risk,” “inattentive,” “homelessness,” “laggards” and, because very few of them are deliberate troublemakers, “agreeable losers”—are simply not bothering to try.

I know a Calgary youth who, with an IQ of 177, could have passed a university arts exam—yet he failed from the day he entered high school. He neglected assignments and gave a “so what?” shrug when reprimanded. He finally quit school halfway through grade 10.

With an IQ of 107 another Calgary student I know has the ability to pass any high school subject but she, too, couldn’t care less. Her highest Christmas exam mark last year was 43 percent; her lowest, two percent.

I don’t know how many laggards are in Canadian high schools (our records don’t show how many failures have the ability to pass) but I suspect that they number in the thousands. The Minimal

George-lee, last fall estimated that 85 percent of students who, in terms of intelligence, should be in the top quarter of high school classes, never graduate. Most of them seem unwilling to make up grades commensurate with their intelligence. From correspondence and conversations with colleagues, I know the laggard is also a problem in the United States and United Kingdom, too.

The waste these students represent to themselves is obvious. But what is worse, they believe that there is some sort of responsibility attached to failure and, so, try to convert good students to this newfound prestige symbol. Teachers I have talked to in every major Canadian city have witnessed the encounter between a student home-bound with an armful of books and the laggard heading home empty-handed. The laggard stares thoughtfully at the books, then out of the corner of his mouth utters, “wanker.”

How did failure become respectable? A strong economy, the working man’s attitude to hard work, parents, teachers, the high school curriculum, some educational psychologists and the students themselves—most have fostered failure.

In our economy wages have climbed faster than individual productivity. Among many workers the “good life” has come to mean “more money for less work.” Getting something for nothing has become a virtue in some circles.

The immediate result is a paradox. On one hand the father refuses to work even an additional half hour without double pay. On the other hand the school expects students to work all day, then do two hours’ homework. The school can hardly hope to win out when, as was illustrated by a 1946 study at Purdue University, more than 95 percent of high school students reflect the attitudes of their parents. As Saint John, N.B., school superintendent W. H. MacKenzie remarked recently: “The development of hard schools in a soft society is not an easy undertaking.”

In addition, many parents and teachers contribute to the problem—not necessarily by openly condoning school failure but by failing to stress the importance of success. I suspect that many parents are little interested in their children’s high school careers. For example, the Parent—Teacher Association of one Calgary high school, with a potential 2,000 numbers, has 60.

Some parents don’t even understand what the high school is trying to do. A Calgary father appearing before the school board to appeal his laggard son’s dismissal was told: “This should come as no surprise. You have had two warnings that the boy was in danger of dismissal.” The father replied: “Honest-to-goodness, I thought you were just trying to scare the kid.”

Teachers must share the blame. Too many of them lack experience or ability to arouse the interest of the laggard. For instance, a Calgary student who failed steadily for two years has joined the navy where—apparently because his naval instructors can arouse his interest—he is successfully completing his high school education.

The teacher shortage—which was partially due to low salaries and the comparatively low respect Canadians have for the teaching profession—resulted in programs aimed at producing the maximum number of teachers in the shortest possible time. From 1953 to 1958 Canadian teachers increased by 33 percent. I think it’s safe to assume that
A shocking number of mentally competent students are getting disgracefully low grades.

The bulk of this increase was made up of young, inexperienced teachers. Hence today about one-third of our teachers have only seven years’ experience. Teachers can’t be blamed for lack of experience, but many of them can try much harder to stimulate student interest.

Our high school curriculum inadvertently accounts for some of the lag, too. By and large it produces the type of student who is satisfied with his present few days to permanently, and, like Calgary, has set procedures for doing so.

Of course procedures vary (Estevan offers alternatives to dismissed you giving outside activities) but the approach is basically the same.

Others, such as the Protestant School Board of Greater Montreal, Metropolitan Toronto’s North York township and Hamilton believe in expelling or suspending students that do not have laid down procedures for doing so.

I know that many Canadian principals are pursuing unofficial disciplinarian policies. At teacher gatherings all over Canada I have asked, “What do you do about students who refuse to work?” Almost always they answer: “Put them out.”

But regardless of the approach, no student in any of the schools mentioned is dismissed until warnings, counselling and parental involvement have failed.

The Calgary policy emerged out of a senior principals’ meeting in 1955. We were all aware of the mounting lagged problem, but had not really come to grips with it. The morning before the meeting I heard, for the umpteenth time, a lagged student crying and stammering: “I can’t do it. I can’t do it.”

What about the teacher? What should get A’s, and is getting low B’s? Would we exclude him for underachieving? The answer is no, and for the simple reason we accept 50 percent as a respectable grade. Would we be spending too much time on the lagged at the expense of the good student? Probably: this was simply a disadvantage of the system.

Finally, was the policy legal? We felt that the section of the Alberta School Act governing boards powers to exclude students for habitual neglect of duty, gave us the necessary authority.

As other school boards adopted lagged policies they gave similar interpretation to their provincial school acts, or, as was the case in Saint John, had the acts amended to cover the policy.

When we had weighed all the questions we informed students and parents of the new policy. Reaction came swiftly.

Calgary newspapers supported us in editorials. A U.S. news magazine carried an article on the policy. I was asked to appear on a television panel show.

Hard on the heels of the publicity came inquiries (178 to date) from school boards in every province and major Canadian city, every state of the U.S., the U.K. and Western India. Not all commented, but I am hearing a favorable reaction. Honorable A. R. Patric, Alberta minister of education and development and a school principal for 25 years, remarked somewhat facetiously, to a child guidance group: “Teaching must be more pleasant since teachers no longer have to face problems; they throw them Ous the window.”

Recently L. D. Hamilton, supervisor of child guidance for the Montreal Protestant School Board, said; “I am somewhat skeptical of a plan which turns pupils out of school and somewhat naively, I think, expects society to deal with a problem which is much more complex than many care to admit.”

Windsor, Ont., Director of Education, T. C. White, who over the years has asked many penetrating questions about the lagged policy, still maintains that laggards can be weeded out through broad interpretation of the school regulations without setting up a formal policy.

After eight years, what are Calgary’s results?

In 1953, 430 students (about 30 percent of the enrolment) were getting marks of less than 50 percent. Today, with double the enrolment, only about 20 percent—680 students—are falling below the 50 percent mark.

The policy exacts steady pressure on the student body. Each November we
We must make scholastic success respectable

have about 150 potential laggards but because of the pressure, only about 35 are finally excluded.

Last year 24 students were excused. Eightied, three, and two of the winners raised their marks above 50 percent on the next set of exams. Usually about half the students who lose appear return to school the following September and about 30-40 percent of them make good marks.

The lagged policy has stepped up communication between parents, teachers, and students. While we have no reason to believe that this has resulted in whatsoever increase in student interest—witness the PTA membership—we have had some gratifying cases.

For instance, the parents of a Calgary student who had marks ranging from 3 to 50 percent (and mostly under 30 percent) appealed. The girl had been absent for weeks.

The mother told the board: "My husband and I are separated. Our daughter lives with my parents. I have had little interest in her school work."

The board read the principal's reports; the parents were satisfied. Noticeably she had noted that the girl's broken home was responsible for her truancy.

"I think you can put an appeal," a board member asked, "will you accept responsibility as this student's mother?"

The mother nodded. The girl returned to school and on her Easter exam passed in all but two of her subjects.

In Calgary all parents seem to have accepted the policy. There have been no complaints—partially, I suspect, because parents want the school to check down even if they don't at home, I think par
tients regard the policy as their policy, ex
dressed through their board.

This policy has forced Calgary teach
ers to do considerable soul searching. They must ask themselves if they have done everything in their power to arouse the lagged's interest. I know our teach
ers are now working harder and devoting more time to their profession.

The policy is good for our board too. It's one of the most progressive boards you will find anywhere but, even so, it tends to become preoccupied with finan
ces and capital expenditure. Acting as court of appeal has brought it down to the flesh and blood fundamentals of education. One result: the board, an ex
pense-conscious as any, now provides a $100 scholarship on university entrance, taking nine honour students.

Most important, I think the system is beginning to create a new social norm. For instance, students are wearing pins and crests awarded for academic achieve
ment and I no longer hear good students being called "nerds."

Whatever method you use to attack the lagged problem, the new social norm must be the goal if we are to have an ultimate solution.

High school students, in the main, are anything but lazy. A recent Toronto sur
vey of 173 students showed that 87 per
cent spent more than 12 hours on home
work out of 70 hours of school time per week. Twenty-seven percent spent 20 to 35 hours. Less than four percent spent less than five hours on homework.

But this is all the more reason that we must save the hard-working majority from the destroying influence of the idle minority. The schools can do much for them but, for a really lasting cure, we need the co-operation of society at large. In short, we must make success respectable.

It can be done and I am certain that in time we can pay the lagged policy the supreme compliment—by making it no longer necessary in our schools.

Eight years ago Robert Warren, Calgary
superintendent of schools, became the first Canadian educator to formally declare war on the "predictability of failure" in Canadian high schools. Since then, Col
gary's lagged student policy has been bolted closed and, in some schools, adopted.

Born in England, Warren has, since 1926, been teacher, principal, department superintendent and high school inspector in the Alberta educational system. He is presently a member of the Alberta High School and University Matricula
tion Examinations Board; the Alberta General Curriculum Committee; the Articu
lation Committee (which coordinates Alberta high school and university pro gra nts); the University of Alberta Student and a member and past director of the Canadian Education Association.

In a lonely little valley in British Columbia stands a giant electronic "ear." Cocked ever skyward, the 84-foot dish revolves slowly on its 50-foot pedestal, straining for sounds from outer space.

It is Canada's largest radio telescope which officially went into operation last summer at White Lake, 15 miles from Ponassaw, Ontario, on the federal depart
ment of mines and technical sur
veys, the big ear will reveal what is happening on nearby planets and what happened thousands of years ago on the edge of our galaxy.

By dialing the right wave length, just as you tune in a radio or television set, scientists in a nearby control room pick up and record on graph paper the intensity and fluctuations of radio waves—buzzing, crackling notes which might be evidence of colliding galaxies, rem
nants of exploding stars or even signals from civilizations on other planets.

Through such radio waves, the tele
scope can measure changing temperatu res on the moon's surface during eclipses, energy from the sun and can track Russian and U.S. satellites. But mainly the astrophysicists beam the telescope to on huge clouds of hydrogen swarming in space. After the radio waves have been recorded, observatory direc
tor Dr. Jack Lumsden and a team of three scientists interpret the irregular lines, much as a doctor reads the abnormal fluctuations of a cardiogram.

Radio astronomy is a very young branch of a very old science. For five thousand years man's curiosity about the stars had to be satisfied by what he could see in a light-gathering or optical telescope. At last, astronomers could view only 1/20 of our galaxy. In 1932, Karl Jansky, a 27-year-old lab worker in the United States, recorded sounds that came from the direction of the Milky Way. He made the discovery accidentally while studying notes affect
ning transcontinental radio telephone cir
cuits. Thus radio astronomy was born and men opened another window onto his universe.

Today there are radio telescopes in many parts of the globe. The free world's largest is the 250-foot antenna at Jodrell Bank in England which on May 8, 1960 sent into space the first command re
ceived and executed by a man-made satellite: when America's Pioneer V was eight million miles from the earth, it was ordered to switch on its 150-watt trans
mitter. Eighty-six seconds later, an in
crased signal from the satellite told scientists their message had been re
ceived. (Not all radio telescopes have transmitters.)

Jodrell Bank will be dwarfed within three years by huge new telescopes in West Virginia and Puerto Rico. With them man may detect radio waves that started their journey before the esti
mated age of the universe and thus help resolve the age-old question of when and how the world began.

There are two major scientific theo ries. One is that the universe was formed with explosive violence about 10 thou
sand million years ago. The second theory is that matter was not created in one
great universal event; that the beginning of the universe may have been 30 to 60 thousand million years ago. This conten
tious creation has gone ever since... and still goes on. Radio telescopes may settle the question.

Canada's radio astronomy program began in 1946 when a physicist with the National Research Council, A. Bertrand Covington, modified a wartime radar set and pointed it towards the sun. To
day Canada holds the longest continuous record of the sun's energy; it has become a world standard. We have 11 radio telescopes, the most recent at White Lake. Others are in planning stages.

The White Lake site was chosen after a careful search for a spot free from man-made radio interference, and from extreme wind or snow that might dis
turb reception of faint signals. The quiet valley sunk amid low mountains seemed ideal. To prevent interference, hundreds of surrounding acres were bought. Grazing cattle and a lone rancher who uses no electricity are the only other valley residents. Visitors' cars have to be parked half a mile away.

In this setting, the 84-foot mesh
covered aluminum dish, weighing five tons, was erected with watch-like pre
cision. Its paraboloidal surface, some 6,000 square feet, had to be held at a tolerance of three-eighths of an inch. To eliminate static, all power and tele
vision lines were sunk underground. Planning and construction took four years. An unusual part of the installation is the 11
inch optical telescope which can photo
graph the area of the sky producing solar noise.

To lubricate the delicate mechanism of the $750,000 installation, Imperial provides 30 varieties of oil and grease.

Already radio astronomy has helped men to navigate aircraft and ships when clouds mask stars. Solar systems have been measured more accurately and temperatures of planets re-estimated—vital information if astronauts are to return alive. Radio astronomy may help us make longer-range weather forecasts, and reveal or control static that makes radio and television reception impossible. And if the current U.S. project Ouma (named after the fictional Lord of the Flies) proves that signals are coming from civiliza
tions on other planets, radio astrono
mers will make the most dramatic dis
cove try of all time—by Jean Danard.
IS MAN STILL MASTER OF THE MACHINE?

Near Detroit, an automobile parts supplier comes to work every morning and beams at his undistracted desk. His firm ships out some 40,000 different parts, in huge quantities every week, to dozens of warehouses all over the United States and Canada. But a mere trickle of accompanying paper work passes over his desk.

How many axle bearings for Detroit? How many hub caps for Boston? Those gear wheels for Vancouver? The steering columns for Oshawa? How many? He doesn’t worry about such details. To fact he doesn’t even know! The scheduling, ordering, supplying, stockpiling—is all done automatically.

Into a computer in June are fed the estimated shipments for the year, an inventory of the 40,000 parts, with the list of dealers and information about the time it takes for them to sell their stocks. The information is up-dated regularly by feeding into the machine the number of parts being used. When any one of the 40,000 items reaches its predetermined low on the stockpile the machine automatically prints an order for a new batch. If the warehouse is not supplied on time, it pops out an expedite order.

This is automation of a high degree. But automation is also an earth satellite beeping out information about conditions in space. It is the design of an army missile. It is the running of an oil refinery cat cracker. It is a self-working elevator.

If you want to know all possible five-letter words having vowels as their second and fourth letters you could feed the alphabet into a properly-programmed computer and nonchalantly tell the other Scrabble players to wait a few seconds for the answer. That, too, would be automation. If you want to translate an 87-page letter from your Hungarian aunt there’s a machine that translates at a rate of 2,400 words a minute...and that’s automation.

Just over six years ago at Louisville, Kentucky, a new industrial revolution started. It began with fanfare and great ex-
to the worker. Some workers simply won’t fit the new jobs.

They may be skilled jobs for unskilled or semi-skilled workers,” he said. “They may be jobs with new skills for workers who have only old skills. They may be white-collar jobs for blue-collar workers. That is why we have to lay such emphasis on education, training and retraining for displaced workers.

Or the job may be in one part of the country and the workers in another. That is why we have to emphasize location-of-industry policy, bringing new jobs to available workers or aiding workers to move to jobs.

It is, of course, in business’ interest to help workers find suitable jobs, because without a market for products—in terms of people employed and able to buy—automation would be uneconomic. If there is danger of mass unemployment, say economists, automation will not proceed until that danger has passed.

There are many other plus and minus factors in the problem. Automation will probably do more of the jobs that man should never have been doing: the dull unendowing and repetitious work that has never really utilized his ability to think. The world-renowned mathematician at Massachusetts Institute of Technology, Norbert Weiner, says, “Automation will bring about the human use of human beings.”

It can also bring about more efficient production. One definition of automation is “machines that can run machines.” Our present system wherein men run machines is often a wasteful process. “We use machines today,” says U.S. economist and student of automation, Peter Drucker, “primarily to do things to material: to cut it, saw it, peel it or cool it, mix it or separate it.”

To do this men must gather information about the machine (its production ability, its quality and the size or shape of its products), feed in material, set the machine and adjust it while it runs. These four jobs, says Drucker, cost more in time and manpower than the work done by the machines themselves. Some machines run one hour for five spent in preparing them. These jobs are done by automation in some modern plants, while workers are assigned to more important and sometimes better-paid jobs.

Automation can also take over complex office tasks. For instance, electronic brains clear cheques for banks and prepare policyholder cheques for insurance companies. All of Imperial’s credit card bills are processed by machines (“We couldn’t handle the volume any other way,” says one official.) Telephone companies use automation in direct distance dialing areas. (You dial the direct distance code number, route code number and your party’s number. An operator then asks “Your number please?” but all other details, including length of conversation, are recorded and tabulated by an electronic computer.)

Some industries—the petroleum industry for one—are more automated than the average for reasons of sheer efficiency. The minute crude oil is brought above ground it has either to be kept on the move, or stored in specially adapted tanks. And the costs of storing a bulky, low-value product can quickly demolish the profit margin.

When crude oil leaves the wellhead it is forced through pipe lines by powerful pumps located in stations at intervals along the route. Some stations are controlled automatically from offices hundreds of miles away. At the refineries, crude oil flows through the pipe lines to the plant under the direction of controls adjusted to the type of crude being used and type of products desired. Large refineries may have a dozen or more control rooms, each usually a separate building near the refining units. Inside it the walls are lined with control panels containing meters, dials and switches manned by highly-trained operators. This is obviously an easier, safer and faster way to run a refinery than to scurry among acres of pipes and towers adjusting manual controls.

At Imperial’s $28,500,000 petrochemical plant in Sarnia, actual operation is carried on by skilled 10-man teams. An automatic device called the “continuous analyzer” constantly tests the plant’s products for impurities, recording in minutes the data that once required hours of manual calculation and

Illustrated by Collette McNeil
chemical analysis in the refinery laboratory. At its Calgary research laboratories Imperial has an electronic resonance analyzer that estimates the size of a new oil field. The operators feed the machine data: oil pressure at the wellhead, temperature, and the permeability of the rock underground.

At the company’s executive offices in Toronto a staff of 10 run a 705 IBM computer—the average man’s conception of “automation.” This machine, operated in two shifts, is mainly used to help various company departments handle repetitive, high-volume clerical and accounting work, study the factors associated with oil exploration, estimate inventories and work out complex refining data. It can do 5,000 additions or subtractions, 75,000 multiplications or 33,000 divisions a minute. It can also play musical notes, if appropriate instructions are fed into it, and read a man’s character (from a set of “characteristics”).

In 1954 only 50 companies in Canada and the U.S. were thought capable enough to need electronic brains. Today nearly 2,000 companies use them in Canada and the U.S. By mid-1966 an estimated 10,000 computers will be in use. But it doesn’t necessarily follow that machines are taking over from men in wholesale fashion. The “brains” can do only what men tell them to do. They are not infallible. Not long ago a change in room humidity (caused by shutting off the summer air conditioning system) caused an electronic accounting machine used by the Toronto Transit Commission to go berserk. The machine, which produced payroll cheques, overwrote some of them as much as $900,000.

Generally, though, the electronic computer is foolproof on mathematical work and makes possible, in hours, scientific calculations that would take years to complete by ordinary methods.

This is the computer’s greatest contribution. At present, however, many companies use the “brains” as expensive adding machines. For a large computer to be profitable on the purely routine operations for which it is often used today, it must effect a gross saving of about $300,000 a year. So, on routine operations, computers rarely pay their way. Often, too, the machines are fed poorly thought-out problems. The programmer must be positive that the information is current and the proposed solution is what he wants, before he “codes” it for the computer.

“The machines are like grand pianos,” says one engineer. “You can become a virtuoso or you can play chopsticks all your life.”

Properly programmed they can help make decisions in mathematical form. Suppose a vice-president asks for market figures for his product in four Canadian areas into which he would like to expand. A properly-coded computer will tell him what percentage of the market he is likely to get. But the machine can also tell him which of the four areas is most suitable, taking into consideration the market acceptance of his product, the sales trend in each province, the transportation problem and any vagaries of local conditions. In other words, the computer in many cases can give a mathematical answer which aids the decision-making of the executive. Of course, it cannot take into consideration the human factors involved—but this is a vague area of decision even for executives.

Military men could plot wartime strategies with computers. For instance, if a large percentage of ships in certain convoys were being sunk by submarines, the “brain” could tell naval headquarters 80 to 90 percent of the possible places where ships could be found and sunk with depth charges, and the number of submarine chasers needed to reduce by any given amount the number of ships being sunk.

Obviously, automation is an aid to man—but not a replacement. But just as obviously, it is revolutionizing man’s working and leisure hours. More high school graduates will go on to university, to train for the special technical and managerial skills that automation demands. Automation will eventually bring shorter hours and increased leisure, and this will stimulate a rash of subsidiary industries related to bowling, golfing, hobbies and the like. But this very leisure—which physical fitness advocates say already makes us the fittest people in the world—may in the end be the greatest problem created by automation.

“The North American society is at present bent with an avid materialism which is attempting to destroy the very democracy it comes from,” said a speaker at a recent social welfare conference. “So, in summary, this newest phase of automation will make our work easier, more productive and less tedious. It will give us extra time for education and leisure. With it, come certain obligations: to make sure that there will be enough jobs; to use the new leisure time wisely; to fit workers to the new kinds of jobs. The very fact that we are concerned with the welfare of the individual in this new ‘industrial revolution’ is, in itself, a mark of progress.”

Ronald S. Ritchie, formerly manager of Imperial’s employee relations department, has been loaned to the Federal government for approximately one year as executive director of the Royal Commission on Government Organization. Born near Chatham, Ont., Mr. Ritchie graduated in economics from the University of Western Ontario and did post-graduate work at Queen’s. During World War II he was with the Wartime Prices and Trade Board and afterwards joined Imperial’s economics and co-ordination department. In 1954, while assistant manager of the Ontario marketing division, he was a delegate to the Commonwealth Relations Conference in Pakistan, and two years later published his book, “NATO — The Economics of an Alliance.” He was then manager of the British Columbia marketing division. He moved to Toronto in June 1958 as assistant general manager of marketing and six months later took charge of employee relations.

In Mr. Ritchie’s absence, George R. McMillin is manager of the employee relations department. He was previously assistant general manager of merchandising.

Most of Mr. McMillin’s 27-year career in the oil business has been spent at two Imperial refineries, Halifax and Sarnia. A native of Barrie, Ont., he started as a lab assistant in Sarnia in 1933 after graduation from the University of Toronto in chemical engineering. He served the war years at Halifax, becoming assistant refinery superintendent. He returned to Sarnia in 1948 as supervisor of the operations section of the engineering division. In 1950 he transferred to the refinery, eventually becoming its superintendent and, in 1954, went to Halifax as refinery manager. He returned to Sarnia in 1956 as refinery manager and took on his most recent duties in June 1960.

Norman R. Callaway is now manager of the crude oil purchasing division in Calgary. He succeeds M. J. "Jack" Hoffman who has been appointed management assistant in the transportation and supply department at the company’s executive offices in Toronto.

Except for four years’ army service during the war, Mr. Callaway has been associated with the oil business since 1940. His first positions were with the Royal Oil Co. and the Madison Gas Co. in Turner Valley when they were subsidiaries of Imperial. In 1948 he became an accountant in Imperial’s production department in Calgary and three years later transferred to the crude oil purchasing division. He was appointed operations supervisor of that division in 1955, was later supply and analysis coordinator, holding that position when he received his present appointment. Mr. Callaway is originally from Cudburne, Alta.
To many Canadians, this 10th province is a small quaint land of fishing folk and songs. Here is the real Newfoundland...a land alive with the sights and sounds of industry and commerce...a land of supermarkets, new housing, higher education and unquenchable optimism.

NEWFOUNDLAND
new look at an old land

Photographs by Ray Nicholls
Almost everywhere is change. New schools are springing up... $45 million has been spent since Confederation. New roads lace the province... 3,000 miles, exclusive of the Trans-Canada highway, since 1949. Besides road-making, construction projects last year totaled more than $150 million. Of this, Imperial Oil, the oldest oil company in the province, spent more than $1 million. There is change in the arts and in commerce. The island now has six television stations and many a small industry has sprung up around the towns... mink ranching at Trinity Bay and, at Brigus, high-fashion knitwear for the smartly-dressed women of St. John's, Toronto and Montreal. And in Labrador—which is Newfoundland too—engineers are starting to tap vast iron ore deposits and tremendous hydroelectric power. In fishing the trend is to power boats with fish-freezing units aboard and a new laboratory at St. John's devotes itself to the life and habits of fish such as cod. Forest products are of increasing importance... last year was one of the best yet for pulpwood production. And miners at Bell Island still work the great beds of iron ore which extend for miles under the sea... but nowadays come off shift to find late-model taxis waiting to whisk some of them to the island ferry.
The Newfoundlander is an individualist, born of a rugged environment. He is, perhaps, the greatest single factor in the island's changing life. He may be sea captain, miner or lumberjack; scientist, legislator or scholar. He may live in neon-lit St. John's or a sun-bleached outport. But the common denominators are unlimited energy and a fierce pride in being a Newfoundlander; a pride which includes the new university buildings at St. John's, the new cement plant at Corner Brook, indeed this whole new and exciting province, built within the traditions of the old.
In the shade outside our hotel, high on the "corniche" road cut along the side of a steep slope between Geneva and Montreux, we sipped cool white wine from the terraced vineyards sloping to Lake Leman below us and looked across the lake to snow-capped Alps.

"Aren't you glad," said my wife, Vivian, "that we have a car!"

I was. It was a heavenly spot we'd have missed traveling any other way. We dripped over looking the lake, walked among moleau vineyards and left next day reluctantly.

It was one of scores of out-of-the-way hotels, museums, monasteries, villages, picnic spots, mountain roads, canals, monuments and scenic vistas in seven countries we would not have seen if we hadn't traveled by car on our first trip to Europe last summer.

We drove in Scotland and England on the "wrong" side, in Paris and Rome where driving is a perennial game of "chickens," on Swiss, Austrian and Italian mountain roads and among Dutch clogs . . . two monasteries without a hitch.

If you enjoy a motor trip on this continent, you'll enjoy wandering around Europe in a car. The pleasures and problems of motoring are the same in both places. We found it is as cheap as any other transportation and a lot more fun. With the car we discovered our own unexplored Europe: a Europe of simple charm, ordinary people and out-of-the-way places.

There was the day, for instance, that we crossed from Montreux to Thou over Switzerland's Col du Pillon. At Giguel we passed enrapped as a score of little girls sat in a circle outside their school learning to knit, with snow-capped mountains loomng above. Later that day we picnicked at a road fork. A brown-stained house trimmed in red stood across the road, a few shepherds' huts dotted the fields. The rest was green meadow, acres of rock and fields of ice and snow. From the peaks came echoes of jots . . . aerial support for troop maneuvers.

Then we heard another sound—a lonesome call which also echoed from the mountain slopes, . . . a Swiss yodeler. Not the staged voices of groups singing in a hotel but the plaintive song of a solitary pedalier. He needed as he pointed, singing still, to be met by a white-haired matriarch at the house across the road. They talked and disappeared. We sat on, watching snow glisten in the sun, listening to the rumble of jets and the memory of his voice.

There and a hundred—a thousand—other memories we treasure: many of them we would not have known had we traveled another way.

There were times when train, plane and bus were more practical. There were also times when an unfamiliar small car, its language barriers and strange customs combined to make us wonder, briefly, whether a package tour wouldn't be simpler.

But after one experience on a guided tour in Rome we had no more doubts. Where we needed an hour, the tours bus stopped five minutes. The climax came as we drove to the catacombs and passed a stone monument to three men, armed bound, obviously facing death.

"What was that?"

"Italians were shot there in the war, 350 of them. Hostages," said the guide. I asked to stop and see more.

"But no. We do not stop here more." He lowered his voice and added "Many Germans travel now in Italy." An ingratiating smile appeared: "We forget the war, eh?"

Next day, in a rented Fiat, we drove back out the Appian Way to the poignent memorial. And this time we stopped and leisurely scoffed our shoes on the original paving stones where Peter walked, where legions marched and where emperors rode in procession.

As we left, we found ourselves outside the "guided tour" area.

By now you've gathered that, in our opinion, motoring is the only way to see Europe. But how did we plan the trip? What were the drawbacks? Most important, what did it cost?

We believe that one travels in Europe, there is the high initial cost of getting there. Once there, you can spend any amount on beautiful china, clothes, crystal, furniture, paintings, watches and cameras. But the actual motoring cost per day was about the same as a similar holiday here. The same trip could be done for much less . . . and for much more.

Hotels or inn averaged $6 for a double room including breakfast; food (usually picnic lunch and hotel dinner) about $5; car rental, $6; gasoline (80 miles a day) about $2; and $3 for miscellaneous admissions (museums, castle, the occasional ferry). Total approximately $22 a day.

Traveling at this rate, our two months in Europe would have cost about $1,300 plus shopping and air fares. Using a car throughout, however, would have meant driving long and hard to visit all we wanted to see. So we spent a few hundred more to be able to drive at a leisurely pace for most of the trip, and flew the long legs between Nice and Rome and Rome and Frankfurt.

We were not, however, blasé or wealthy travelers. We approached the trip with some trepidation, anxious to use our time and money to best advantage, and so we began with months of planning. From this we can offer a word of advice for other novices: ask and read about everything you can but set yourself all with your own common sense. Some people and travel books merely throw out pourous warnings about dangers, difficulties and pitfalls, especially for motorists:

"You'll never find a place to stay." "Your just can't find anyone who understands ANTHING in English." "Tours are such fun. You'll meet such interesting people." (From Montreal or Toronto, we presumed. Well, we wanted to meet Europeans.)

For museums, scenic views, art, historical sites, street maps, routes and brief history we found Michelin Guides superb. They are printed in English by London's New Chronicle. From each country's travel office we obtained prices of air lines, buses, boats and Europe-wide rail tickets. (You can write for tourist information to any of the embassies in Ottawa, or just send out clippings from the ads in your newspaper's travel section.) The tourist offices of most countries put out handy hotel guides (rooms, rooms, baths, prices). Get them in advance; they are difficult to locate overseas.

We also consulted a travel agent, who helped with information and made two reservaitons a car in Glasgow and our return flight back. A good travel agent can be invaluable.

Vivian studied European history at a university night course reviewing the broad trends of western European development since 1550. It led to greater appreciation of the inter-relationship of art, architecture, religion and wars in the countries we saw.

Our final plan: fly to Glasgow, drive in Scotland and England for two weeks, leave the car in London: a week there. Fly to Paris for several days, another car for three to four weeks through France to Geneva, across Switzerland to Munich, through Austria to Italy down to Venice, across to Genoa, turning in the car on the French Riviera, fly to Rome for a week; fly to Frankfurt and down the Rhine by boat; finally a train to Amsterdam for a flight home.

With this fairly loose schedule and with only minor changes, we reached Amsterdam with several days to spare, never feeling rushed anywhere. No hotel turned us away. We booked our flights a day or two before we needed them, got cars in Rome and Amsterdam within an hour after phoning. Maybe we were lucky. Maybe we were just ahead of the summer rush. But I'm convinced that, away from the tourists' beaten track, adequate accommodation is available any month of the year.

A New York daisian excelsior met me on my train in Holland and this eliminate reservations are not essential. I "Can turn up," he said "any hour of the day or night at
Idewild Airport, bag in one hand and money in the other, and be on my way to Europe within two hours. Usually less than that.”

He also claimed he could do the same at the major shipping docks at New York, Le Havre and Southampton, and at most international airports. Not being quite that casual a traveler, though, I’d prefer to have reservations over and back.

However, we found that last-minute changes made little difference. We decided at five p.m. one night, standing on the docks at Coblentz, to go on to Amsterdam rather than stay in Germany. We flagged a cab to the station. “Watch the bags, I’ll check trains.” In five minutes I had bought more deutschmarks with a traveler’s cheque and traded them for two tickets to Amsterdam. We were settled in a cozy compartment when the 5:17 train pulled out.

Indeed, sometimes last-minute arrangements were best. From Canada by mail and from Edinburgh by phone we failed to get seats for Merchant of Venice in Stratford-on-Avon. We drove to the box office half an hour before curtain time and got two aisle seats in the stalls, front and centre.

It all sounds so simple—and for us it was.

Obtaining cars is easy. We rented a Morris Minor in England, a Renault Dauphine for a month around Europe, a Fiat in Rome ($12 a day) and a Volkswagen ($5 a day) in Holland. The Dauphine cost just over $7 a day for 25 days including full collision coverage.

Our Ontario drivers’ licenses were acceptable everywhere. Paper work on car rentals was no more than similar rentals in Canada. Gasoline prices are between 30c and 75c a gallon but, of course, the smaller cars give better mileage. You can, incidentally, buy tourist gasoline coupons at discount in Italy (about 35 percent, at border points and cities) and France (in the banks).

But don’t expect to tote up many miles per day, if you want to explore towns and side roads. It’s almost impossible to drive more than five miles without seeing something that makes you want to stop. Even if you are driving steadily, don’t expect to cover 35 miles in 35 minutes, as you might in Canada. European roads have more turns, more cyclists and more pedestrians. We planned 100 miles a day but averaged only 60. We usually were on the road about nine or 10 a.m., and in a hotel by five or six p.m.

Roads were good everywhere we went, Alpine roads were more twisting, but no more difficult to negotiate than the Canadian Rockies. And, to our surprise, we often swung around a mountain turn in Switzerland or into a German city to find an Eisa station looking precisely like those at home. Customs vary, however. Windshields are washed and oil is checked usually only on request and a small tip is expected. In England, don’t say “Fill ‘er up”; just order even gallons. Working out fractions of gallons in shillings and pence is too much even for the English.

Driving on the “wrong” side in Britain could be awkward if you took over a North American car with left-side steering. Rent a right-hand drive and you are sitting near the middle of the road, beside the white line, just as at home. We were used to it in an hour. Most of Europe, of course, drives on the “right” side of the road.

Traffic rules are about the same as on this continent; road signs are self-explanatory and uniform throughout Europe. Border crossings are simpler than between Canada and United States. Whether by air, train, or car, the only time we were asked to open luggages was by United States customs on our return at Idewild.
Our luggage, incidentally, consisted of two medium-size suitcases, my wife's large purse and my World War II flight bag. We left one bag locked in the car, took the other to our room. Shirts, underclothes, and socks were wash-and-dry and we had two of everything. Vivian had one good dress and I had one good suit.

The flight bag held camera, film, exposure meter, hard candy, 22's, notebook, guide books, hotel lists and binoculars. Don't fail to take binoculars, to examine paintings, ceiling in castles, cathedral roof carvings and mountians. I also found them invaluable for studying Riviera beauties in bikinis.

With a car, finding hotels is easy. European hotels usually concentrate around railway stations. Motels haven't arrived yet, though I'm told they are popular in some parts of Germany. We simply drove until we saw a sign reading hotel or "pension" (a cross between a Canadian tourist home and a small-town commercial hotel). Sometimes the charm of a place persuaded us to stop long before it was time to start looking. We checked the name against hotel lists, put out by each government for room rates.

Inside I asked (by signs and frequent reference to phrase books) for a room for two and the crucial question, "How much?" This set the tone of negotiations at once: I was a tourist but price-conscious. Invariably the price was as listed. I'd ask to see the room (which seemed to be expected). European pensions are perfectly comfortable. Only once did we refuse a room because it was dirty—on Elkyoor Moor in Yorkshire. I neglected to ask to see the room first. Its sink, floor, furniture and linen were dirty. Leavin Vivian sitting on the bags, I went to the manager. He agreed the room wasn't much. I suggested he might be organized for meals and dancing but not for guests. Again he agreed. "Then you won't mind if we check out again?"

н共青团 of not, old boy" he said. "Guests are a bit of a nuisance really.

At Villeneuve on the French Riviera we had an ultra-modern mahogany and ceramic tile room overlooking the harbor and town for $8. At Alton in Hampshire, $6.72 got us a great barn of a room with huge double beds, exquisite Victorian furniture and a bathtub as big as a swimming pool. At Cheviros in Switzerland, our 35 room with balcony overlook of Lake Lenon, where we could watch wisps of cloud playing hide-and-seek with the Alps. All these prices include service charge; you tip only if service is exceptional and you wish to do so.

Near Hadrian's Wall in northern England we stayed at a charming inn where the hostess served us massive roast beef sandwiches and great mugs of "aff"-n'-larf in front of the furor fire because his staff had left and that "was the best he could do."

Big city hotels were usually good, too. In Rome we had a pension on the Via Vittorio Veneto (the fashionable street) with a shower, breakfast and dinner for $4,500 lira—about $9.25 a day, or half the rate at more swanky hotels down the street. Our window overlooked treetops of the Villa Borghese and soft rose bricks of Rome's ancient wall and its Porta Pinciana. At Venice we looked over the harbor, the Grand Canal, and the street below.

Mind you, our casual approach meant that our accommodations wasn't always ideal. We spent one night in a tiny room in York, which, while clean, was musty and reached only by several sets of winding stairs. At Bourges in France we settled in an ancient room with the community bathroom next door; the plumbing worked only too well.

Food was no problem, though I'm plugged by a host of allergies and my wife has a problem tummy. We ate fresh fruit, drank local wines and water everywhere and didn't even open the cold storage pills a wag gave us the Christmas before we left.

Was the language a problem—all though neither of us has a foreign language. We learned at least three phrases as we drove toward each country: "Please," "thank you," and "how much?" Apparently many tourists don't even try that much. People seemed pleased with our asking such simple words and knocked themselves out to be helpful.

Near Verona we stopped at a fruit stand beside a lake to buy oranges.

"Per favore, dis l'arancia, grazie mille," I said, in atrocious phrase-book Italian.

The vendor probably didn't understand, but responded with a flood of incomprehensible Italian. I made an attempt, he replied in kind: national honor was satisfied. With no signs and smiles we completed the transaction.

In Rome I stopped a carcabinie near the Pantheon. "Per favore, signore, indicatemi il Porta Pinciana?" "Ah," he said, "maybe you speak a little English?"

We handled seven currencies in as many weeks without difficulty. Travel books devote pages to tipping; I just figured out the coin chosen in purchasing power to our dime and quarter and tipped as I would in Canada. Tips were indicated in some unexpected places. In Paris, Vivian found a public convenience near the Cathedrale du Sacre Coeur. She came out with a startled look on her face followed by an elderly dame spewing torrents of angry French.

"Did you tip her?" I asked, remembering the guide book. "Goodness, no." I tossed a coin and the mollified nun returned to her chair.

There may be many shysters in European shops, hotels and restaurants but we encountered only one (in an Italian bakery the boy tried to hold back 100 lira—about 7 francs—in change). Reputable dealers were recognizable by the same standards as in home: clean, smart shops, pleasant sales people, prices clearly marked and frank and honest comparisons. At Bachau, a village on the Rhine, we bought more china than we should. I hesitated a moment before signing one of our dwindling supply of traveler's checks. "Pardon, sir, your personal cheque to give perhaps?"

It happened in Venice and again in Amsterdam. No one asked to we credit card, passport or driver's licence. (Try that in Halifax, Winnipeg or Vancouver.) Twice we took goods with us; on the other occasion the seller mailed directly to our Canadian address.

Was ours just "first-time traveler's luck?" Parly, perhaps. Would such a motorizing vacation suit everyone? Not necessarily.

But for us it had everything. On the one hand we saw all the classic tourist attractions at our leisure. And on the other had discovered Europe in such strange ways as parking the car on a village street, wandering from shop to shop buying a loaf of crisp bread, a slab of soft muffin cheese and a quart of wine (for about 25 cents), then bunching on a grassy hillside while a tiny steamer rapped over a lake below.

And that's why, when friends ask now, "Was it worth it?" we say, "Every penny's worth."

While Canadians like Bill and Vivian Havre vacation abroad by car, millions of others are discovering Canada the same way. Of the approximately 12 million who traveled last summer, the Canadian Tourist Association reports that 83.3 percent traveled by automobile.

For several thousand, planning was easy: they simply gave their problems and questions to Imperial's Essio Tourism Service. From the lobby of the company's executive office building in Toronto the service filled 112,000 requests for maps, information on road surfaces, detours, fans, musicians and any other totally unclassifiable questions.

Most popular summer destination for Canadian holiday drivers is the Atlantic provinces with New England and the Canadian west (particularly Vancouver and the national parks) running close behind. "There seems to be a growing trend," says Essio service manager C. E. Andrews, "particularly as the Trans-Canada highway nears completion and accommodations improves. During the winter, of course, the emphasis shifts almost exclusively to Florida."

An average of three different area maps are required to answer requests and maps are updated every year from information supplied by a small army of contacts in Canada and the U.S. Every other year automobile vacationists away from highway construction detours, the service receives an average of one bulletin a week from highways departments on both sides of the border. As a final check, touring service staff drive about 12,000 miles a year, checking road surfaces and carefully clocking mileage. "When we say "this is the shortest route" we know we are right," says Andrews.

Most requests come from the Toronto area, usually on special request cards supplied by Imperial dealers. However, not all requests are from tourists or even motorists. The touring service bears regularly from enthusiastic map collectors in France and Argentina and during the past two years has received requests from:

- four Toronto girls who planned to cross the country in a covered wagon;
- a Hamilton man who wanted to ride horseback to Calgary;
- an Englishman who planned to take a canoe route to Churchill, Man;
- the lady who asked for a route covering old cemeteries—he liked to read headstone inscriptions. And, finally, a traveler who wanted a route to Florida, "preferably not by a Canadian route."

Illustrated by Martin Stronger

Good guides and maps were easy to obtain.

Motorists at home

They ask 100,000 questions.
BUSIEST BIRD IN THE AIR

It was a warm August evening in 1958 at McGill Stadium in the heart of Montreal. More than 22,000 fans were watching the opening game of the Big Four football season. Only 11 minutes had been played in the first quarter when a helicopter loomed large and loud over the field.

"Anything for publicity," grunted the fans.

But this was no publicity stunt. The players were waved to the sidelines. The red, white and blue RCAF helicopter whirled down to a gentle landing. Outside the Montreal Neurological Institute, which overlooks the playing field, a team of doctors, nurses and stretcher bearers was waiting.

Aboard the helicopter was a 43-year-old man who, less than two hours before, had fractured his skull in a fall from a second-storey scaffold of a construction project at Cornwall, Ont., 70 miles away. Speedy and delicate brain surgery was his only hope. Thanks to the helicopter and the surgeons of MNI, the man lived.

Apart from its 22,000 spectators, the flight was routine. For four years an unofficial but regular helicopter ambulance service has operated from points outside the city to the MNI. The RCAF has made two dozen such flights and civilian operators have made many more.

Such missions keep the helicopter in the news, but mercy flying is only one of its many roles. As befitting a machine that can fly straight up, down, backward, sideways, or stand still in mid-air, the helicopter is both bizarre adventurer and prosaic workhorse. Igor Sikorsky, who developed the first modern helicopter for use during World War II, says it is the most versatile vehicle available to man.

Nobody disputes him. So far, the helicopter is such a special bird that there are only 219 in Canada, 69 of them in the armed services. But it's the adventurer of the airways—the trouble-shooter that specializes in jobs no other aircraft can do.

Not far from the North Pole last summer the helicopter was the main instrument in the scientific survey of the polar continental shelf. Auster Ltd., a Montreal 'copter company, averaged 60 take-offs and landings per day as scientists aboard studied oceangraphy, hydrography, geology, glaciology and marine biology.

In the Fifties, helicopters helped build a 50-mile power transmission line over the peaks of the Rockies to B.C.'s Klinmat aluminum smelter. On such a hazardous proving ground, the mettle of Okanagan Helicopters Ltd. was tested.

In a three-year stretch, Okanagan's pilots made some 10,000 safe landings on small platforms built among the peaks along the path of the transmission line.

From its headquarters in Vancouver, Okanagan still finds enough work to keep 60 machines—one of the world's largest commercial helicopter fleets—deployed across the country. Once every 10 days, its choppers patrol the Trans-Mountain Pipe Line, looking for landslides and leaks. At the company's school in Penticton, B.C., helicopter pilots are trained for the RCAF and the USAF. Its machines operate the supply run to the isolated bases along the western section of the Mid-Canada Line, and fly Imperial Oil geologists into the Rocky Mountains.

Imperial has employed as many as six charter 'copters during a four-month summer season. Last year two of the craft served geological crews in the Rocky Mountain foothills, dropping two-man search parties in otherwise inaccessible spots each morning, ferrying them home each night.

Search and rescue is, of course, a 'copter specialty. Perhaps the most remarkable helicopter rescue in Canada took place in November 1955. A Liberian freighter, the Kwaer, broke her rudder and foundered in a high gale near the northern tip of Cape Breton Island. The shore was a sheer cliff, rising one thousand feet from the water. The crew launched a lifeboat; it was battered to bits.

By two p.m., November 26, Lt.-Cmdr. John Beeman, commanding officer of the RCN's helicopter utility squadron at Halifax, and three crewmen were hoisting over the Kwaer. Visibility was less than three-quarters of a mile. The wind was gusting to 45 knots. For 45 minutes Beeman tried to drop a hoist rope within reach of the 21 men below.

Next day, with winds still high, Beeman set the 'copter down precariously on the freighter deck, the rudder blades only 25 feet from the cliff. In four trips the 'copter rescued the entire crew and its mascot dog.

In fact, helicopters will go anywhere. They've helped control curlews in the

An injured man is landed at McGill Stadium
Northwest Territories, plant trout in Alberta mountain lakes, and ferry Santa Claus throughout Quebec for stores, service clubs and chambers of commerce. Dupuis Frères, a large Montreal department store, flies Santa to its pre-Christmas parade by copter.

In Nigeria's recent election campaign, one of the candidates traveled the hustings by chopper. In the U.S. copters have been used to create waves in lodges stranded boats from beaches.

In 1959 the Hamilton Spectator took Royal Tour photographs of Stoness Creek, Ont., rushed them three miles to the city, lowered them to a photographer waiting on the Spectator roof and had them in an edition on the street within an hour.

One week last summer, when two important viaducts crossing Toronto's Don River were partially closed for repairs, radio station CFRB broadcast advice from a charter chopper hovering above the fuming rush hour drivers.

Ontario forest rangers use helicopters to tag moose. A pentagon-equipped chopper chases the moose into deep water and lowers over it. The tagger, with speared lines attached, is on the back, straddles the pontoons and clamps the tag on the animal's ear. The entire job takes about five minutes.

And in the purely frivolous category: an air show in the U.S. not long ago, four choppers perfomed an aerial square dance in time to a 20-piece loudspeaker.

Although the helicopter is relatively new, the idea is not. By 1200 A.D., the Chinese had built two piles and spun them into the air with the aid of feather "wings." At the dawn of the 16th century, Leonardo da Vinci took time out from his painting to sketch a rotating wing parachute. He called his screw-like device "helix," the Greek for spiral shape. Later, a combination of "helix" with "pierrot," meaning wing, produced helicopter.

Two Frenchmen in 1784 constructed and flew a small model helicopter that had two sets of rotating wings, made of feathers. An Italian designed a steam-driven model helicopter and in 1878 got it airborne at 40 feet for 20 seconds.

At the turn of the 20th century the Wright brothers were achieving fame with fixed wing flight and Wilbur Wright remarked, "The helicopter is much easier to design than the airplane but it is worthless when done." But the chopper enthusiasts, including Thomas Edison and Alexander Graham Bell, were doggedly continuing their experiments.

Before the helicopter evolved into its present form, a Spaniard, Juan de la Cierva, invented the autogiro in the 1920's. The autogiro was, in simple terms, a stubby-wing airplane with rotary wings on top and conventional propeller. Since the rotary wings lacked power, the autogiro could not hover, but it took off and landed more steeply than airplanes.

The helicopter of today is not just another fixed-wing plane gone wrong. It's a special craft requiring its own special skill in piloting. The remarkable flying characteristics—up, down, forward, sideways, backwards—are achieved by controlling the power-driven rotary wings.

Most chopper pilots would rather fly than try to explain how it is done.

("Well, it's something like rubbing your stonewash and putting your head at the same time") The level, or pitch, of the rotor blades is the key to flight control. By pushing the control stick forward, for instance, the rotors tip upward, which gives them a bigger bite of the air and provides the lift for the machine.

"You have to control and fly the beast at all times," says Jack Schofield of Montreal, president of Laurentide Aviation, who learned helicopter flying after 18 years and 10,000 hours as a fixed-wing pilot.

"That's the secret of its appeal."

By the early years of World War II, Igor Sikorsky had convinced the military that the helicopter could be useful for vertical lifting. It took the Korean war to really prove the usefulness of the chopper. It evacuated 21,000 wounded UN troops from the front lines. U.S. Marine copters transported 60,000 men and 3,700 tons of cargo. The chopper ferried fresh troops to positions in Korea that could not be reached by surface transport.

The RCAF formed its first helicopter flight, 108 Communications Flight, for Mid-Canada Line duty back in 1954. One of the first trips was 170 miles into the wilderness north of Bagotville, Que., to fly a sick Indian woman to hospital in Newport. Within months such errands were commonplace.

Less commonplace was the trick performed by S/Ldr. Bob Hasslip, commanding officer of 108 Flight. Hasslip picked up a Cessna aircraft that had crashed through the spring ice on a northern Quebec lake and brought it, by sling, to an airstrip 20 miles away.

But mostly, on Mid-Canada service, the helicopters were the "hit and gully riders," performing countless short hops ferrying workmen and equipment to and from. Similarly, in commercial aviation, the short hop "flying limousine" service is well-established in New York, Chicago and Los Angeles. In New York, I-seater copters carry customers from a helicopter near the Hudson River at West 30th Street to LaGuardia, Idlewild and Newark airports. Other flights are operated to surrounding points in Connecticut and New Jersey.

New York Airways is buying larger, more powerful and faster helicopters. By 1965, it will have 65-passenger rotodynes, machines that take off vertically as a helicopter, and fly horizontally as a jet. This will provide a faster service, accommodate more people and be more economical for the air line.

Short-hop helicopter service is being studied in several Canadian cities. There's talk of a "ferry" between Toronto's Malton airport and the east end of the metropolitan area. A year ago a demonstration flight of the 22-passenger Vertol 107, from the Parliament buildings in Ottawa to the Sun Life building in Montreal, was timed at 44 minutes. There are plans for a helicopter stop at the 42-storey Place Ville Marie building, now under construction next door to the Sun Life.

In Montreal also, a special committee from the city council is studying the idea of establishing a regular helicopter ambulance service, operating from outside the city not only to the McGill football stadium but to the roof of the new St. Justin's Hospital for Children. At present, use of the helicopter as a "family car" seems far in the future. "Copters are expensive (the smallest ranges from $35,000 to $40,000). Piloting the craft calls for an exciting skill and training and present-day pay for a "copter pilot can run from $1,000 a month and up."

But already the helicopter is moving into automobile territory—as witness the experience of a motel operator near Simcoe, Ont. One evening two Ontario Hydro employees, after a day of checking power lines, landed their Bell two-seater in a field near his motel.

"Nothing wrong," they assured the startled owner. "We're just looking for a room for the night. Any vacancies?"

They got their room.