New Delhi
June 1971

Canada

The Good Samaritan of Labrador

On cold, forbidding "Starvation Coast" Sir Wilfred Grenfell gave the world a warm and memorable example of Christian love

By David MacDonald

At North West River, on Canada's rugged Labrador coast, an urgent radio message crackled in from a remote northern outport: a pregnant Eskimo girl was bleeding internally, her life ebbing away. Within minutes, a red float-plane took off on a race against death.

For two hours, while the pilot bucked heavy arctic head winds, the young English nurse beside him stared down at the bleak, brooding wilderness that early explorers damned as "the land God gave to Cain." Then the plane banked between jagged peaks, still snowcapped in summer, and settled onto Kaipokok Bay. A fishing boat brought the girl out from a huddle of huts. Pale and writhing with pain, she was lifted into the aircraft, which quickly took off again. After giving her a sedative, the nurse radioed North West River and described her plight to a Canadian doctor.

"We'll be ready," he replied. An hour and a half later just in time—the patient was wheeled into the operating room of a Grenfell Mission hospital, where blood transfusions and major surgery saved her life.

For thousands of others in Labrador and northern Newfoundland, the world-famous Grenfell Mission has been the difference between life and death—and a lasting monument to the legendary Labrador doctor, Wilfred Thomason Grenfell.

Grenfell was 27 when he sailed from England to Labrador as medical missionary to the Newfoundlanders who fished there in summer. He didn't plan to stay long. But because he found such sickness on "Starvation Coast"—a 1000-mile stretch of subarctic tundra, where 5000 Eskimos, Indians and whites lived in grinding poverty—he devoted the rest of his life to its forgotten people. Slight and shaggy, with sparkling eyes and a face that grew lined and leathery from exposure, he spent 42 years making rounds by dog-sled, ship and snowshoe. Grenfell went wherever he was needed, treating the sick in sod-covered hovels, skin tents and igloos, operating in lantern-lit cabins.

Grenfell earned renown as "the Good Samaritan of Labrador" and founded the Mission—which grew to have four hospitals, 14 nursing stations and a staff of 400 to carry on his tradition of service. To millions, much to his own amusement, he was a glamorous figure—the hardy little doctor who wore Eskimo furs and slept on the trail at 30 below with his dogs. When he got lost one night in the wilds of New York City, newspapers relished the way he found his bearings—from the North Star.

Few people anywhere have done more to illuminate the meaning of brotherly love. The son of an Anglican clergyman, educated at Marlborough and Oxford, Wilfred Grenfell entered medical school at 18. Two years later, in 1885, he wandered into a revival meeting held by Moody and Sankey, the famous U.S. evangelists. "When I left," he wrote later, "it was with a determination either to make religion a real effort to do what I thought Christ would do in my place as a doctor, or frankly abandon it."

After his graduation, Dr. Grenfell joined the church sponsored Royal National Mission to Deep-Sea Fishermen, whose motto was "Heal the Sick and Preach the Word." For five years he ministered to fishing fleets from Iceland to the Bay of Biscay.

Then, in 1892, he crossed the Atlantic in the small hospital ship **Albert** to look into conditions among some 25,000 men, women and children who sailed to Labrador each spring in a thousand Newfoundland fishing schooners. On his first day there, the **Albert** eased through a maze of icebergs into Domino Run. As ships ran up welcome flags, salty skippers rowed over to greet Grenfell, whose Oxford accent and candy-stripe blazer seemed grandly out of place.

Left, is a view of St. Anthony, a tiny village 320 miles north of St. John's Newfoundland, where the Grenfell Association has its main outpost. From here, each summer, the mission sends out the 70-foot hospital schooner, "Maraval", to bring doctors and medicines to outports on the Labrador coast. At St. Anthony's there is a 75-bed hospital, children's home, industrial workshop and clothing store, all belonging to the Grenfell Mission.

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That night he was called ashore to a dank shanty where a man lay dying of pneumonia and tuberculosis while his wife and six ragged children looked on, helpless. "I could only pray for him," Grenfell said later, "when what he needed was a hospital and a trained nurse."

Within two months he learned the harsh facts of life and death among Labrador's year-round inhabitants: the inland Indians, the Eskimos of the north and the wretched white "Liveyeres" (from "live here") who had clung to the coast for a century. In a land offering little food but fish and berries, scurvy and rickets were rife. TB killed one adult in three; one of three infants died within a year. And for a population that grew to 30,000 in summer, there wasn't one doctor. Before leaving that fall Grenfell stopped again at Domino Run. The man he'd visited there was dead, his family destitute. He gave them food, clothing and a promise: "I'll be back."

In St. John's, capital of Newfoundland, Grenfell roused citizens with harrowing tales: of a crippled child whose only dress was her father's cut-down trouser leg; of a Liveyere who'd killed his three youngest children and himself so that his wife and two eldest might have food enough to survive until spring. He told them he wanted to open two cottage hospitals on Starvation Coast. They donated the buildings, and a winter of lecturing in England brought gifts of medical supplies, clothing and money.

When he returned in 1893, he had two other doctors and two nurses in tow. They opened a 16-bed summer hospital at Battle Harbour, and another hospital 200 miles up the coast. Then Grenfell sailed to the far North, where no doctor had gone before.

Everywhere he met age-old superstitions. Both whites and Eskimos treated diphtheria by tying split herring around the victim's neck. Fishermen conducted weird potions by boiling pulley-block scrappings in water, and women tried to cure diseases of children's eyes by blowing sugar into them. Gradually they came to accept Grenfell's strange medicine. For he seemed like a miracle worker: simple cataract operations made the blind see again; after ten minutes of surgery on an ingrown toenail the lame could walk erect. He delivered babies, yanked teeth, broke and reset crooked legs, treated everything from chickenpox to cancer.

That summer, when the three doctors helped 2500 patients, Grenfell began dreaming of a chain of hospitals and nursing stations to serve the coast all year. So he went "begging." In Montreal he met Lord Strathcona, then Sir Donald Smith, a Canadian railroad tycoon who'd once worked in Labrador, and talked him into donating a sturdy hospital ship. Then Grenfell made a speaking tour across Canada, collecting cash and new followers. Slowly his dream began to come true. In 1899, after winter closed his two Labrador hospitals, he crossed over to St. Anthony in northern Newfoundland. Isolated, beset by hunger and disease, it was Labrador all over again. There, at his urging, villagers cut wood and built a roomy hospital that became his Mission's permanent headquarters.

"When someone needs help," he often said, "nothing else counts." More than once he risked his life. On Easter Sunday of 1908, two men brought word that a boy was gravely ill at Brent Island. They wanted to rest their sled-dogs, then take Grenfell back with them. But he wouldn't wait. Fearing the boy might die, he set off alone. While short-cutting across frozen Hare Bay, his Eskimo **komatik** sank through rotted ice. Half paralyzed by the frigid water, he managed to cut his huskies free, then swam to a small ice pan.

To stay alive, Grenfell killed and skinned three dogs, wrapping their bloody fur around him. At night, drifting out to sea, he made a windbreak of the carcasses and curled up beside his biggest dog to sleep. Next day, with the legs of the dead animals bound together into a grotesque flagstaff, he waved his shirt at the fading shore.

Luckily, he was seen by a fisherman who'd climbed a cliff with a telescope to look for seals. When rescuers finally reached him, Grenfell's hands and feet were frozen. Yet his first words were, "I'm sorry to put you to all this bother."

A year later, aboard a transatlantic liner, Grenfell met Anne MacClanahan, a beautiful American socialite who had once turned down an invitation to hear him speak because she imagined he'd be "too dull." Before the ship docked in New York, they were engaged. Married in Chicago, they went north to St. Anthony, where Grenfell's young bride quickly busied herself with Mission projects.

And there were many. For Grenfell couldn't confine himself to medicine and religion. "How can one preach the gospel of love to hungry people by sermons?" he asked.

The chief cause of sickness in Labrador was malnutrition, induced by the poverty of that hard land, worsened by the fact that fishermen and trappers seldom earned cash. Instead, local traders gave them credit, only to claim their catches later at cut rates.

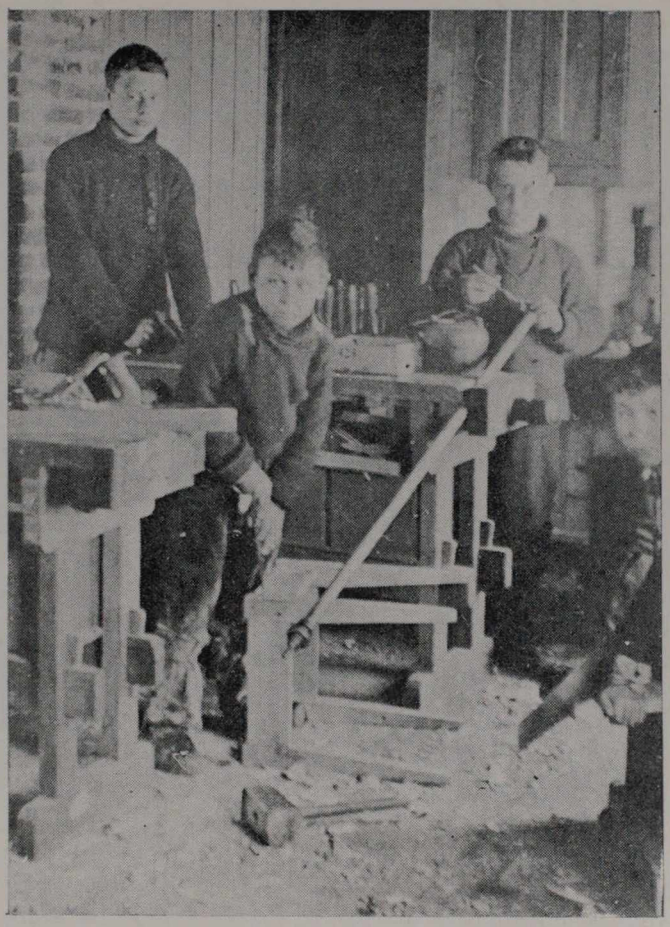
To fight such feudal exploitation, Grenfell rounded up furs, sold them on the outside market—at three times Labrador's going rate—and returned every cent to the trappers. In Red Bay, he helped 17 fishermen start a cooperative store. They bought their first supplies with money that Grenfell lent, shipped their catch to market in a schooner he provided. Before long, Red Bay was debt-free. In all, Grenfell launched ten co-ops. Most of them flourished; when one failed, he hocked one of his boats for $12,000 to pay its bills.

Another reason for Labrador's poverty, Grenfell felt, was ignorance. The few schools were all strictly sectarian. While some settlements had none, others had four—Catholic, Methodist, Anglican and Salvation Army—competing against each other. Unable to convince missionaries that they should unite their energies, he recruited teachers from the United States and started his own schools, open to all.

He brought five orphans back from Labrador and found an anonymous donor to build a children's home—the first of four—at St. Anthony. He started "cottage industries"—mainly handcrafts—so that Labrador would not be entirely dependent on fish and furs. U.S. and Canadian women sent him silk stockings and old dresses to be turned into hooked rugs—and money. He set up a dozen centers to distribute cast-off clothing, and opened two more hospitals.

To support his work, admirers in the United States, Canada, England and Ireland formed the International Grenfell Association in 1912. Their best fund-raiser was Grenfell himself, whose speaking tours pulled in huge crowds and hundreds of thousands of dollars. Wealthy men gave him X-ray machines, Yale and Princeton students financed two orphanages and schoolchildren sent their dimes to help.

"Dr. Grenfell has a genius for generating sympathy," a friend said. "He can wring tears from people's pocketbooks." Once, on a train to Boston, he noticed a woman wearing a huge diamond ring and boldly asked its cost. Grenfell introduced himself to the indignant woman and told her of his work. "What a waste to wear an expensive ornament like that," he added, "when there are so many hungry children in Labrador." The woman removed her ring and offered it to him.



Boys' class in carpentry at a mission school, St. Anthony, Newfoundland; May 1906.

"No one can eat a diamond," he said. "But I **will** accept its value in money." He got it—$2500.

Dr. Grenfell explained his dedication simply: "I've always believed that the Good Samaritan went across the road to the wounded man just because he **wanted** to." Many others followed his lead. Dr. Harry Paddon left England for Labrador after hearing a speech by Grenfell. His son, also a doctor, eventually served there too. Charles Curtis, a brilliant young surgeon from Boston, joined the Mission in 1915 and gave it the remaining 48 years of his life. Grenfell nurses often stayed alone on the coast for months, coping with problems that would have fazed many a doctor. Once a delirious Liveyere fisherman ripped his stomach open with a knife. With a priest serving as anesthetist and directions wired from the nearest doctor—Mission posts were linked by telegraph—a Grenfell nurse performed a complex operation and saved his life.

The regular Mission staff was aided by hundreds of volunteers. Dentists and debutantes, businessmen and college students, they rolled bandages, dug ditches, taught school, crewed hospital ships, christened babies—hundreds called Wilfred—and did dozens of menial chores.

Most heartening of all, the Mission generated self-help. Because of the schools Grenfell opened and a special education fund his wife set up, the children of illiterate fishermen and trappers found wider horizons. Many studied on Grenfell scholarships, then came back as teachers, nurses, ministers—leaders among their own people.

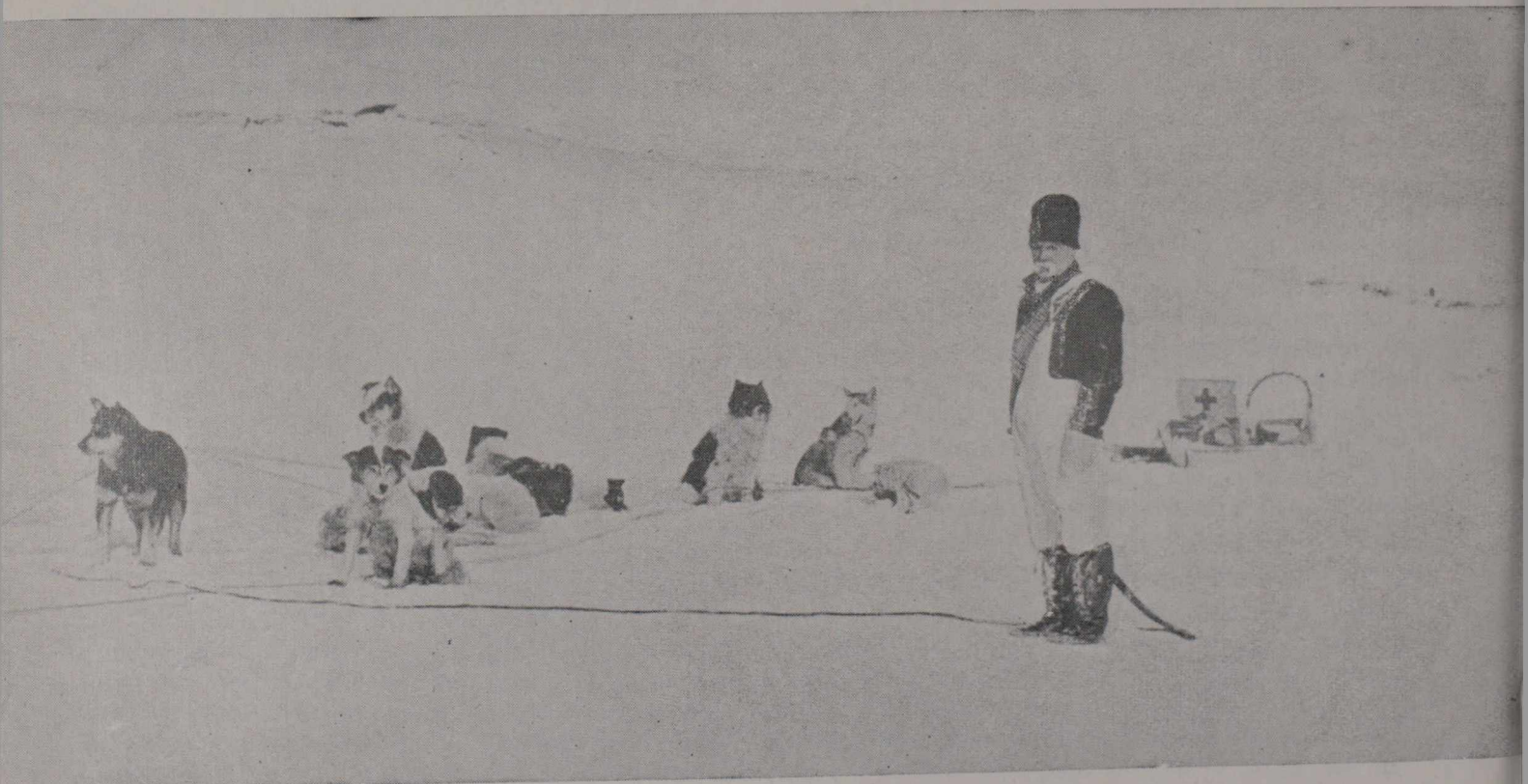
In fact, when the Mission put up a new 80-bed hospital at St. Anthony in 1927, the project was directed by one of Grenfell's first Labrador orphans, who had studied engineering in New York. Built of reinforced concrete, the hospital was as up-to-date as any in North America. For Grenfell, remembering when there weren't a dozen bottles of iodine on the entire coast, its opening day was the proudest of his life.

A highlight of the day was a surprise announcement from Buckingham Palace: King George V was to knight the doctor. "I only pray," he said, "that this tag to my name won't be a barrier between me and my friends on the coast." It never was. Labrador people worshiped him.

Despite illness, Grenfell went on making speeches and writing books—more than 20 in all—to raise money for his Mission. In 1937, at 72, he had to retire as its superintendent. "I'm getting too old to drive dog-teams," he said sadly.

The next year his wife died, and Grenfell made his last trip to St. Anthony, to bury her ashes. Though the occasion was solemn, hundreds cheered when "the doctor" stepped ashore. In command of a hospital ship once more, he crossed over to Labrador to make his final rounds. There he found more than 20 doctors and nurses carrying on his work. The scourges of the coast —TB, infant mortality, malnutrition—were sharply reduced. Now the sick had proper care, there were homes for the homeless and help for the crippled and the blind.

The day he sailed away for the last time, all 600 residents of St. Anthony turned out to say good-by. A year later, at his home by Lake Champlain, he lay down for a nap before supper one night and never wakened. He died wearing the same old Oxford blazer he'd worn at Domino Run in 1892, on his first day in Labrador. In that cold land, Grenfell had given the world a warm, unforgettable example of Christian love.



Sir Wilfred Grenfell with one of his dogteams.

The Canadian management team in Zambia pose with a locomotive used for training purposes.

CANADIAN NATIONAL RAILWAYS IN AFRICA

Canadian National Railways has sent a team of 23 men to Zambia, Central Africa, on a job that spells out a new enterprise for this modern railway—the exporting of expertise.

The 23 experts, headed by Harry Fast, formerly manager of CN's Rideau region at Belleville, Ontario, have taken over the management of Zambia Railways under a contract backed by a $2,500,000 loan agreement signed by the Canadian and Zambian governments last November. Under the terms of this agreement the Canadian interest-free loan is to help finance the management of Zambia Railways over a five-year period which began on December 1, 1970.

The management contract and its supporting loan agreement are the result of a world-wide search by landlocked Zambia, anxious to update the services of its essential 650-mile link with the rest of the world. Zambia first asked Canada to send a team of consultants to Africa, but soon decided it would be better if Canadian railwaymen took over management of the railway.

Canada's public-owned railway has been involved in overseas railways before, but only on a consultancy basis. The Zambian agreement marks CN's first venture into the actual management of another railway.

Zambia's railway is linked with the systems of Rhodesia and Mozambique to the south and south-east, and Congo-Kinshasa and Angola to the north and north-west. Overcoming co-operation problems with some of these countries poses a big problem since most of Zambia's essential freight—imports of maize and coal and exports of copper—**must** travel by rail.

A major job for Mr. Fast is negotiating with the general managers of the neighbouring railways to secure a better service for Zambia. He says there are many things that can be done to improve services without violating political considerations.

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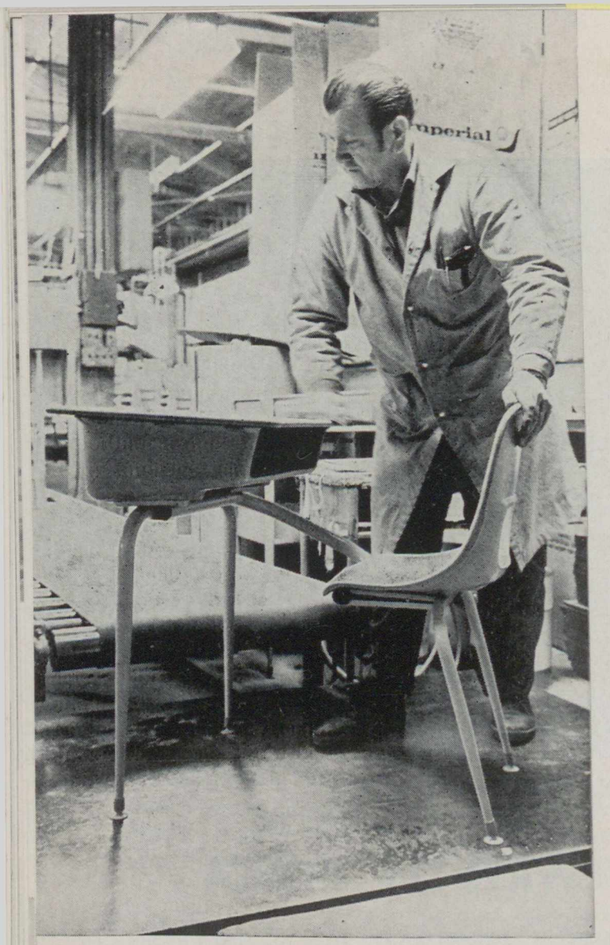


"MADE IN CANADA"

Backing Canada's favourable position among the top ten heavyweight trading nations of the modern world is a $45,500,000,000 manufacturing industry employing close to two million Canadians. Their output of fabricated and finished products—ranging from cowboy shirts (a big seller in Japan) to ponderous, tracked land-ships (destined for Russia)—make up about three quarters of Canada's total exports of $16,500,000,000.

In the last 10 years the value of manufactured exports has soared, earning the nation $12,500,000,000 in 1970—an increase of 125 per cent since 1960.

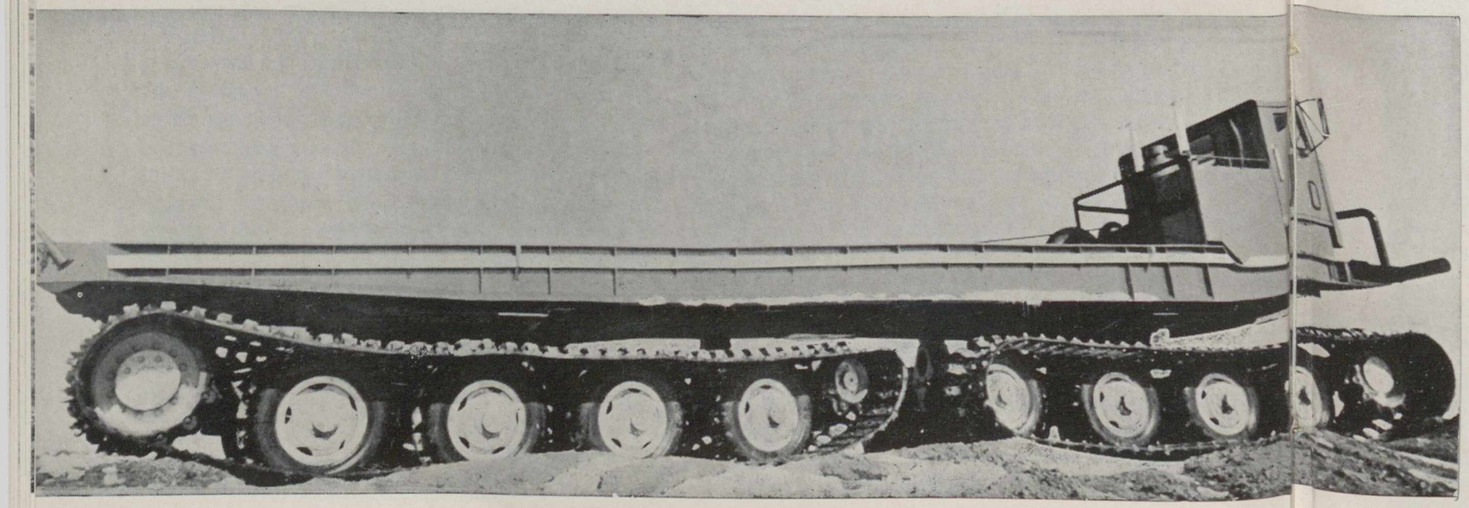
Catalogue No. 65-004 for 1970, published by the Dominion Bureau of Statistics tells the story of Canadian manufactured exports.

Examples:

235,264 snowmobiles went to 23 different countries (including Surinam and Indonesia) for a value of $160 million.

Television sets, radios, record players and combinations earned Canada $32 million on the export market; furniture: $32 million; razors and blades: $2 million, outdoor jackets, $5 million; overcoats $16 million; perfumes and cosmetics $1,600,000; hockey sticks and ice skates, $12 million; newspapers, magazines and periodicals, $10 million; books and pamphlets $7 million; printed matter (not elsewhere specified) $10 million; turbine engines, $42 million; rock drilling machinery (a real Canadian speciality) $17 million; chain saws, $5.5 million (doubled by chain saw parts, $12 million); automobiles, trucks, trailers and parts, $3,400 million; aircraft, engines and parts, $379 million; tires and tubes, $20 million; telephone equipment $66 million; military weapons, $60 million; electricity (to the United States) $34 million; and whisky $183 million.

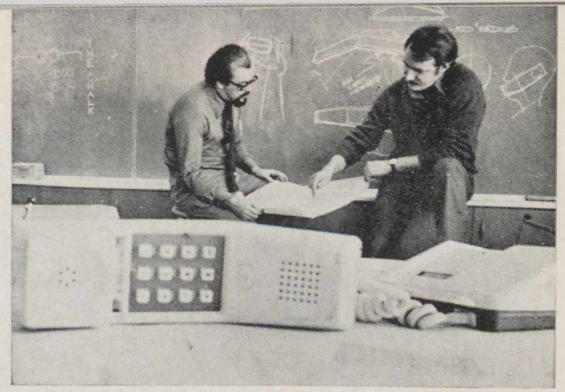
Heavy equipment, ornaments, underwear, machinery and thousands of other items in daily use around today's busy world carry the tag **Made in Canada**—in ever-increasing variety and quantity.

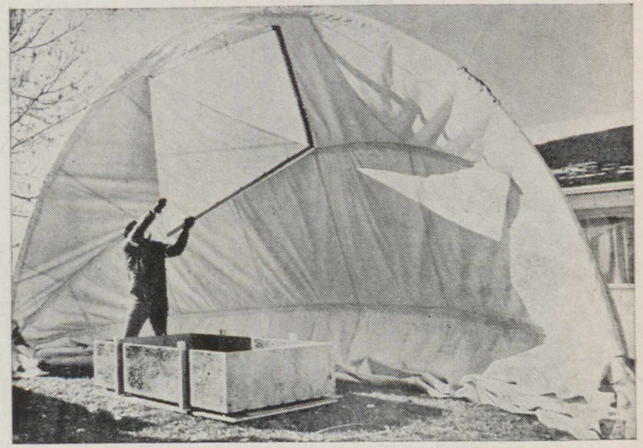


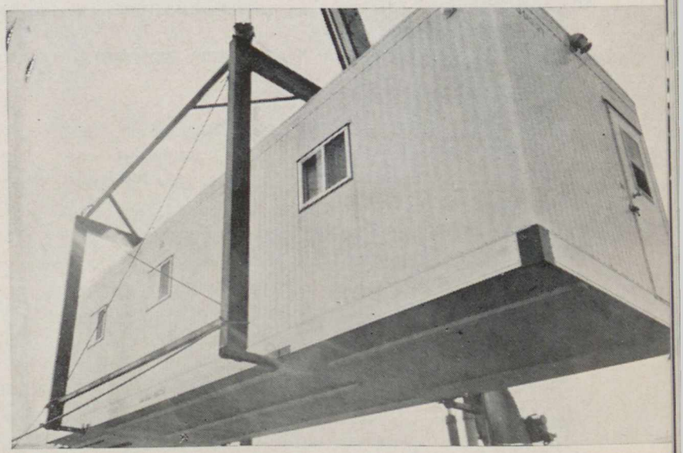
Upper left: Imperial Industries Ltd. of South Burnaby, B.C. won an award for this school desk and chair.

Left:
A Foremost vehicle on the testing ground.

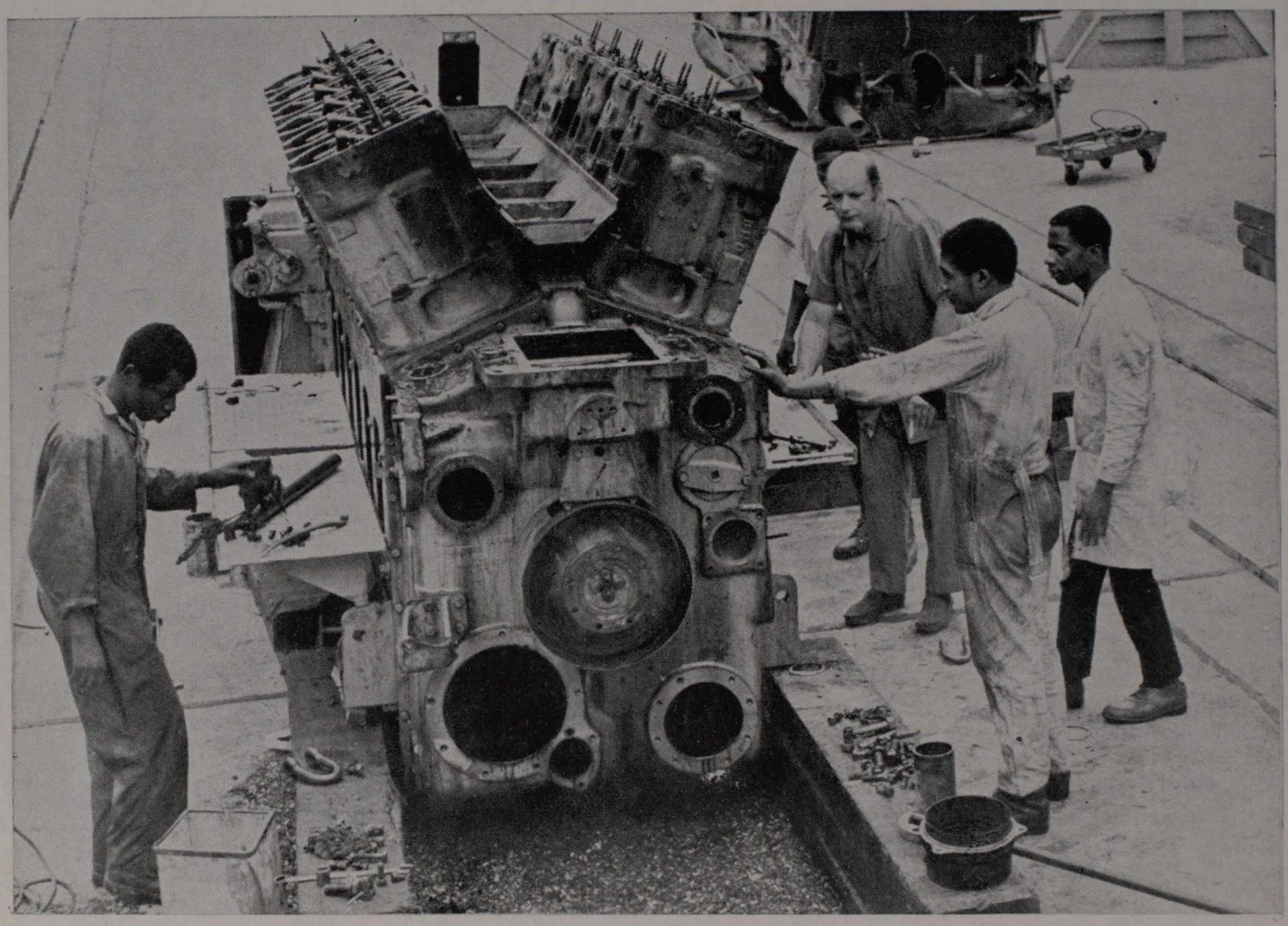
National Film Board Photostory
By **John Ough**







Top: Contempra telephone set made by Northern Electric Company, Ottawa was designed by John Tyson and James Bee.
Centre: ATCO Industries of Calgary originally designed and made this Portable Equipment Shelter.
Bottom: Accommodation units for railway line crews made by ATCO Ltd. of Montreal.



Ross MacIver from Saskatoon, Saskatchewan supervises a team working on a locomotive engine at Kabwe repair shop.

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Zambia's railway line was first opened in 1904 to reach the rich mineral deposits in what was then Northern Rhodesia. It crosses the Zambezi River just below the famous Victoria Falls and trundles north across rolling savannah for 650 miles to emerge in Congo-Kinshasa, just north of Zambia's copperbelt. On the way it passes through the capital city of Lusaka and the mining town of Kabwe, formerly Broken Hill and now the headquarters of Zambia Railways.

Mr. Fast and his team aim to overhaul Zambia Railway by introducing a more flexible and more commercial system of management. They intend using the same plan that changed the face of CN in Canada—a plan that took ten years to fulfil. But Mr. Fast is confident that it will take much less than ten years to bring a new look to Zambia Railways.

Incorporated into the five-year contract is an obligation for the Canadian team to train Zambians to take over their jobs, so arrangements have been made to organize a management training programme covering an average of 16 man-months per year.

The Canadians also hope to improve Zambia Railways' passenger service and to introduce such facilities as dining and sleeping cars. But the problem here is shortage of equipment. Zambia Railways operates on 3 ft. 6 ins.-wide tracks—an unusually narrow gauge—and second-hand equipment is hard to find.

However, Mr. Fast is now investigating the possibility of shipping equipment to Zambia from the one place in Canada with a 3 ft. 6 ins. gauge railway—Newfoundland.

Spare parts being made in Kabwe repair shop.

National Film Board Photostory by Eric Bailey.

Wilder Penfield Explorer of the Human Brain

A great surgeon relieved the suffering of hundreds of epileptics and gave us rare insight into the mysteries of the mind

By Murray Teigh Bloom

From the gallery of the Montreal Neurological Institute's main operating room I witnessed a seven-hour brain operation performed by one of the world's great neurosurgeons, Dr. Wilder Penfield, whose work has uncovered important clues to the intricacies of the human nervous system.

The patient this day is a 29-year-old New England salesman whose severe and frequent epileptic seizures have prevented him from working regularly. Dr. Penfield is his last hope.

The pace in the operating room is deceptively relaxed and leisurely. Under a local anesthetic a flap of the patient's shaven scalp is formed by a curved incision, a door of skull is sawed out, and turned back with the scalp flap and held by retractors. Now the dura, the filmlike covering of the brain, is opened and a section of the brain about the size of a saucer lies exposed, convoluted gray traversed by throbbing red arteries. The brain itself is a three-pound mass of pink-gray jelly, composed of some ten billion cells.

Sitting nearby, when he is needed, is a key member of Dr. Penfield's team, Dr. Herbert Jasper, a leading electroencephalographer. It is his job to interpret the hill-and-dale lines inked by the pens of a machine registering electric currents generated by the brain as the surgeon touches it at various points. The patient is conscious throughout.

Dr. Penfield's probing electrode touches a spot on the cortex, the gray matter. "I felt something in my thumb and forefinger," the salesman says. A tiny sterile tag numbered 1 is dropped on the spot on the cortex.

The electrode touches other spots, and tags are dropped in place for each reaction. Thus the brain areas controlling the patient's lips, jaws, eyelids, nose and chin are identified. The gentle but relentless probing goes on. Suddenly at tag 26 we hear the epileptic say, tensely: "I had a warning of an attack just then—the strongest one yet."

With tag 30 the electrode probes deeper into the yielding gray matter. "This is it," the patient gasps as he stiffens. On the electroencephalograph we can see the vivid "spike" markings produced by a small epileptic seizure. In a minute it is over.

The hours pass. Gradually the area of the brain's temporal lobe in which this man's attacks start becomes clearly defined. Fortunately it does not include any areas of important or vital functions such as sight, hearing or breathing. Now the diseased tissue, hard and rubbery, is carefully removed with a metal suction device.

Seven hours after the operation began Dr. Penfield sews the dura with a curved needle. An assistant takes over to replace the retracted skull flap. Another epileptic has a good chance of being reclaimed for normal living.

Dr. Penfield, as director of the Montreal Neurological Institute, probably the world's leading center for neurological surgery and research, performed that operation hundreds of times. During one of his early pioneering operations, in 1931, he stumbled upon a patient's invisibly recorded past—his probing suddenly brought forth from the patient an account of a long-forgotten

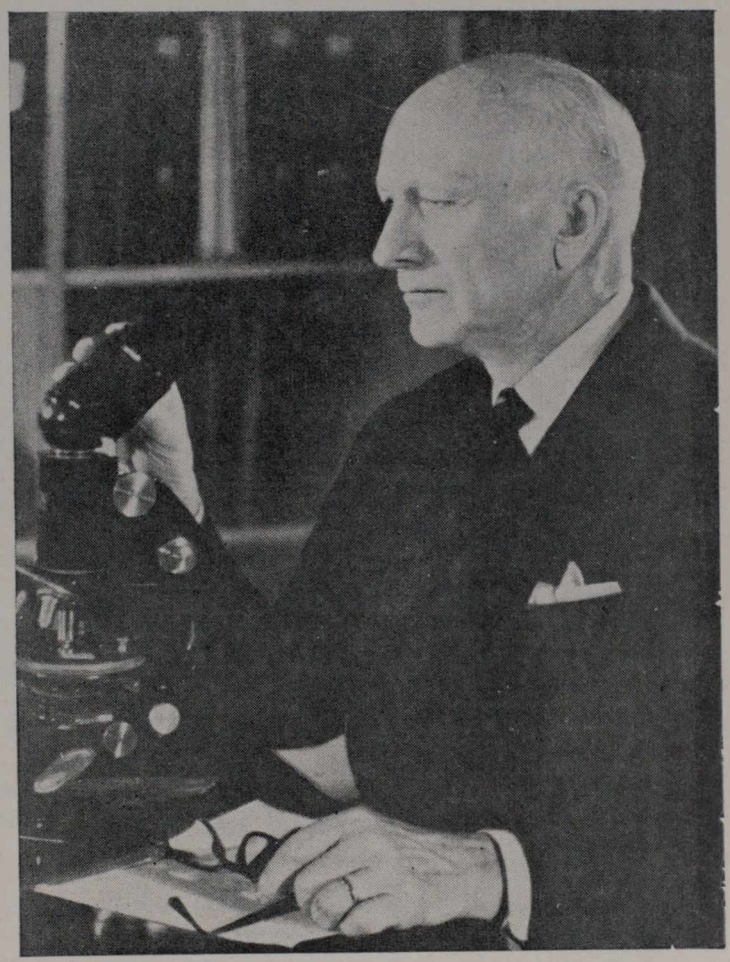
experience. The incident has led to new insight into the strange mechanisms of human memory, of how the brain records every waking sight and sound and, literally, how we profit by past experience. This unique knowledge, developed patiently over the years by Dr. Penfield, has been called "a turning point in the study of mankind."

Some members of the class of 1913 at Princeton University are still surprised that "Pen" Penfield of Spokane, Wash., became a surgeon. At college he was mainly interested in playing football. (Not until his junior year did he decide to study medicine.) In the autumn following graduation he coached the freshman team. The following year he was head field coach of the varsity. He won a Rhodes scholarship, and left after the season was over to begin his medical studies at Oxford. He taught himself to be ambidextrous and started using a straight razor to help develop a steady hand for surgery.

At Oxford he met the man who influenced his life vastly: the famous Canadian, Sir William Osler, then Regius Professor of Medicine. In 1916 Penfield returned to the United States to complete his medical studies at Johns Hopkins. When he graduated he had a wife, a child and no money. But he still had one unused year of his three-year Rhodes scholarship. Borrowing money, he returned with his family to Oxford to study with Sir Charles Sherrington, the greatest living expert on the human nervous system. After that Penfield knew what his lifework was to be: neurosurgery.

In 1928 came another turning point in his life. He was offered the chair of neurosurgery at Montreal's McGill University because of his growing reputation as a surgeon and experimenter in the nerve cell laboratory he had founded at New York's Presbyterian Hospital. In Montreal, Penfield dreamed of a vast new institute devoted exclusively to the study and treatment of brain ailments. He is a persuasive dreamer. Contributions from the Rockefeller Foundation and wealthy Canadians enabled the vision to come to life. In 1934 the Montreal Neurological Institute, an eight-story limestone building on the slopes of Mount Royal, opened its doors.

Today half or more of the institute's patients are without funds and Dr. Penfield's only income



Dr. Penfield

is from a comparatively small group of private patients. But there are other rewards. Though he is a naturalized Canadian citizen, he has been at or near the top of popularity polls of "greatest living Canadians." He has also been awarded the Order of Merit. (Dwight D. Eisenhower and Winston Churchill are two of the 24 members of the order.)

These honors surprise no one, but they underline an almost incredible irony. This unorthodox, trail-blazing surgeon was once regarded with pity by his colleagues for his perseverance. The British neuro-surgeon, Sir Geoffrey Jefferson, said of him: "Penfield devoted his life to epilepsy research at a time when the subject was regarded by the medical profession as fruitless and time-wasting. He persevered for 20 years in a medical desert, in the face of every kind of discouragement."

Penfield believed epilepsy was not a disease but a symptom of something awry in the brain. And his persistent investigations have shown that epilepsy is literally an electrical explosion brought on by a too heavy charge accumulating frequently in a damaged part of the brain. The damage in more than half of his patients is attributable to inadequate oxygen or improper head compression at birth.

The surgical procedure Dr. Penfield developed is known as the Foerster-Penfield operation. It was first performed by Dr. Otfried Foerster in Germany. Dr. Penfield helped Foerster to analyze his results while he was studying neurosurgery there. Until 1934 the results were not promising but today half of the patients selected for operation from among those not responding to the anti-convulsant drugs are cured by operation. In another 25 per cent the operation cuts the number and severity of seizures.

On recommendations of their physicians, patients come to the MNI from all over the world. One of the earliest of these was a middle-aged housewife, and it was halfway through this operation that the historic incident took place which has helped us understand the miracle of human memory.

Dr. Penfield's probing electrode touched a spot on one of the two temporal lobes, above the ears. At once the housewife exclaimed in surprise that she seemed to be having her baby all over again. She went on to describe the sights and sounds of the delivery room—vividly, exactly and in detail, as if the events were taking place again before her eyes.

Dr. Penfield knew that when certain parts of the brain were touched with the electrode he could cause a leg to jump, an eye to wink. Such responses had been carefully plotted on an atlas of the cerebral cortex showing which parts of the gray matter governed different body functions. But the vivid recall of an incident that had happened years ago was completely unexpected.

Soon a succession of similar incidents occurred. A young South African suddenly saw himself back in a family gathering, heard the piano playing.

"No, doctor," he exclaimed in wonder, "I am not just remembering it. It is happening again in this room. I know I am in Montreal but I seem to be with my friends too. I can see and hear them."

A secretary recreated a period when she once had to wait hours in a snowbound station. A businessman relieved a forgotten moment of his childhood when he saw a strange man coming through the fence at a baseball game.

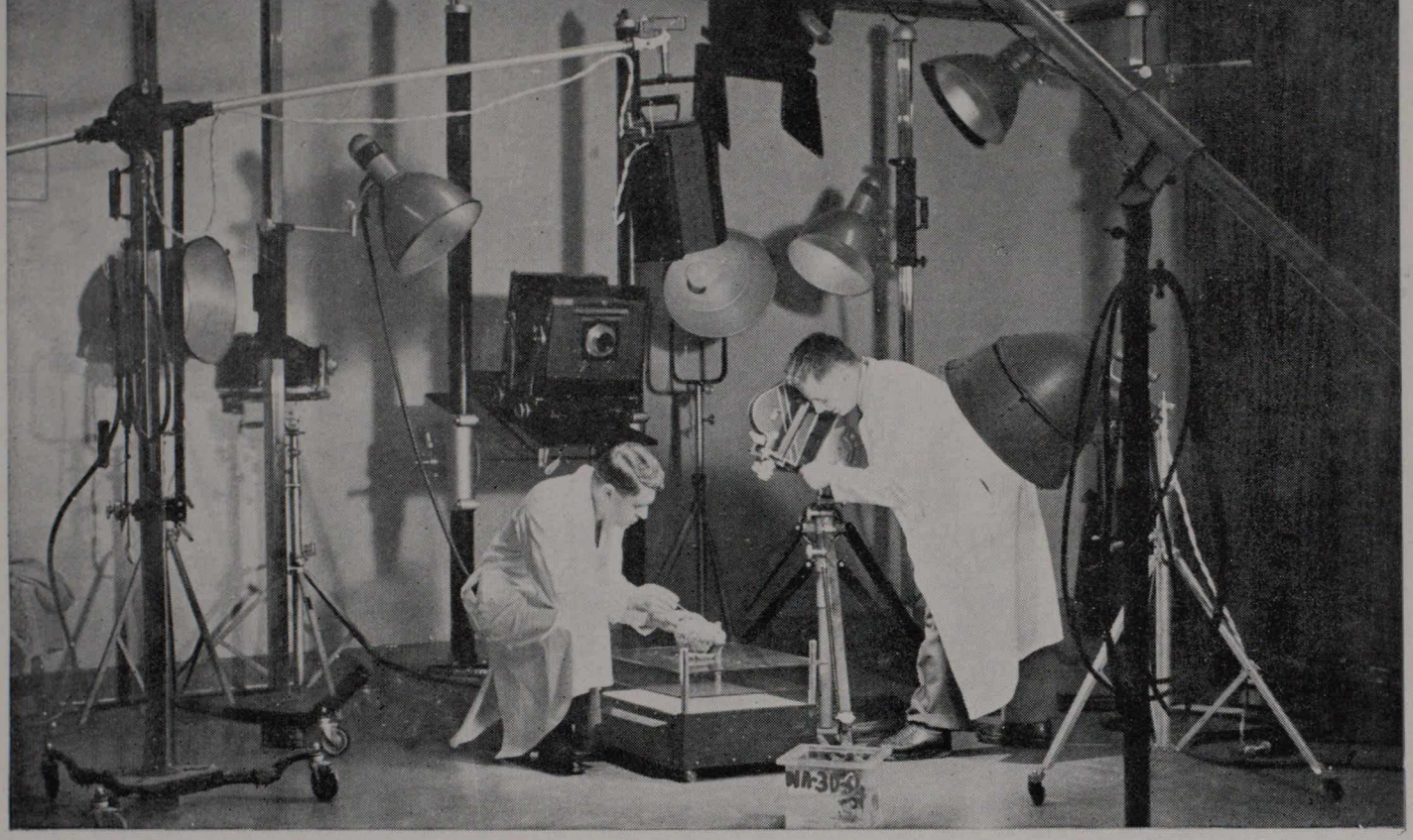
Dr. Penfield would tell his patients he was going to touch the same spot with the electrode again and then ask them what they saw or heard now. Since the brain itself is incapable of feeling anything, the patient had no way of knowing that Dr. Penfield was deliberately withholding the electrode. Yet each time, the patient would report that he saw and heard nothing. But when Dr. Penfield did retouch the spot, he would get a repetition of the sights and sounds the patient had reported previously.

One young woman reported she was in the living room of a house her family had lived in more than 15 years before and that a phonograph was playing the march from **Aida.** She hummed it as she listened inwardly. When the electrode was removed the music stopped. When it was reapplied she heard the music again—where it had begun previously. Dozens of similar instances finally convinced Dr. Penfield that he had stumbled on a completely new phenomenon.

Every day our eyes take a half million snapshots. Our ears bring the accompanying sound to an adjoining part of the temporal lobes. Somehow the sound is synchronized with the "film" so that the two are always together when there is a memory playback. Two experiences ("strips of time," Dr. Penfield calls them) are never activated at the same time.

"Among the millions of nerve cells that clothe parts of the brain there runs a thread," Dr. Penfield says. "It is the thread of time, the thread that has run through each succeeding wakeful hour of the individual's past life. When my electrode activates some portion of that thread, there is a response as though the thread were a wire recorder, or a strip of movie film on which are registered all those things which the person selected for his attention in that interval of time."

Simultaneously as the "film" and sound track are permanently recorded in the brain several "indexes" are probably also created, Dr. Penfield believes, so that the mind can find a particular living memory quickly.



Neuro-photography has an important place at the Institute. All operations are filmed, for discussion and teaching purposes, through a large mirror over the operating table using a 40 inch lense. Here the brain is being photographed as part of a film on neuro research.

How does this "indexing" system work? You suddenly meet a friend you haven't seen for years. As he turns and looks at you there is a sense of familiarity. Suddenly you recognize him. But even as you focus your attention on him you realize he is changed in little ways.

"There is a difference," Dr. Penfield explains, "between this moving, talking individual and the detailed record of him that is preserved in your brain, a record you could not have conjured up voluntarily. Now you see the new lines in his face, an altered stoop to his shoulder. Actually, on seeing him again you have reopened the old 'file,' rediscovered its contents, compared past with present."

These quick reviews of old "files" take place many times a day. Dr. Penfield believes. Whether we are approaching a dangerous traffic intersection or trying to find a name for a face seen in a crowd, the brain's marvelous review mechanism will automatically call up long-forgotten incidents and details for comparison and interpretation.

Dr. Penfield's monumental work has immediate applications for all of us. It tends to confirm, for example, the effectiveness of audio-visual methods of education. Lessons are learned better when facts are recorded simultaneously by eye and ear on our minds. Dr. Penfield also believes that foreign languages should be taught in childhood when the mind is most receptive to a second tongue. He points out that although the language learned then may be forgotten with lack of practice, only a few weeks in the land where it is spoken will bring back the former ability. For the mind has **permanently** recorded the early lessons.

Controlling the vast network which feeds information to our memory storehouse and brings forth interpretations and answers is the upper brain stem, which links the brain's two hemispheres. This may well be the true seat of human consciousness, Dr. Penfield thinks.

"The slightest injury to the upper brain stem usually produces deep unconsciousness. This is not true of the cortex, the brain's outer covering, or of the lobes. Such a headquarters switchboard as I believe the upper brain stem to be is so delicate, so complicated, as to stagger the imagination."

The mind itself may never have the wisdom to comprehend fully its own workings. But thanks to Dr. Penfield and his hundreds of epileptic patients we now have some key clues to explain what makes the human brain the most marvelous machine on earth.

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CANADIAN ROUNDUP

BILINGUAL DISTRICTS

Ottawa: May 3. The creation of 37 districts in which federal services should be provided in both French and English was recommended in the report of the Bilingual District Advisory Board tabled in the Commons. All of Quebec and New Brunswick and at least one district in each of the other provinces were included in the designation of areas with at least 10 per cent of the population speaking the minority language. The Board recommended that radio and TV broadcast policy focus on providing bilingual service in all regions—not only those officially designated as bilingual. Another suggestion called for federal subsidies to encourage provinces to provide services in both languages. The Advisory Board was created under the Official Languages Act of 1969 and has based its recommendations on census data, visits to provincial governments and to each of the designated areas.

NO VOLUNTARY OR COMPULSORY RESTRAINTS

Ottawa: May 4. Arthur Smith, Chairman of the Economic Council of Canada, says the Government should not try to control wages and prices by voluntary or compulsory restraints. In an analysis prepared for the senate inquiry into economic management Mr. Smith said policy should aim at steadily growing employment rather than control of market forces. The Government should stimulate productive activity by budgeting expenditures slightly in excess of the tax income that would be generated if unemployment were four percent.

SOCIAL CREDIT PARTY

Ottawa: May 6. The newly re-formed Social Credit Party of Canada declared it is assuming a national role and will hold a leadership convention in Hull, Quebec, next October. Gilbert Rondeau, MP for Shefford and party president, told a news conference that three candidates intend to challenge Real Caouette's leadership.

COMMUNICATIONS SATELLITE

Ottawa: May 9. Canada signed an agreement to launch its first space communications satellite late in 1972 and a backup space broadcaster six months later. The Communications Department said the two satellites will be launched from Cape Kennedy by the USA National Aeronautics and Space Administration. Telesat Canada, the corporate body which will operate the space satellites, will pay NASA for use of the USA facilities and Thor-delta launch rockets.

SASKATCHEWAN ELECTIONS

Regina: May 25. Premier Ross Thatcher announced Tuesday there will be a Saskatchewan provincial election Wednesday June 23. Mr. Thatcher's Liberal party holds 34 of the legislatures 60 seats.

COUNCIL OF MARITIME PREMIERS

Fredericton: May 26. The first formal meeting of the Council of Maritime Premiers ended with agreement to establish a number of joint agencies to serve Nova Scotia, New Brunswick and Prince Edward Island. An education commission, an industrial research council, a central mapping and survey agency, a regional statistics bank and a police training centre were included among the measures announced. Standardization of motor vehicle regulations and coordination of environmental programs were also promised in the statement by Premiers Richard Hatfield of New Brunswick, Gerald Regan of Nova Scotia, and Alex Campbell of Prince Edward Island. The Premiers refused to endorse the recommendation of the report on Maritime Union released last fall that the three provinces achieve full political union within 10 years. They said more study was required before plans for such a move could be made.

NEW POLITICAL MOVEMENT

Ottawa: May 25. Former Transport Minister Paul Hellyer, who resigned from the Liberal caucus Friday, announced at a news conference the formation of a new political movement called Action Canada. Mr. Hellyer said the organization will advocate mandatory wage and price controls to achieve stable prices and full employment. He said there was no other way to control interests with monopoly power. Membership in Action Canada costs dollars 10 but unemployed persons will be given a free membership until they find a job. A news release says Action Canada is not a traditional type of political party but would run candidates if it was considered necessary. The main purpose of the movement was to influence politicians. It would endorse those who supported Action Canada policies.

TRUDEAU ENDS SOVIET TOUR

Ottawa: May 28. The Prime Minister returned to Ottawa on May 28 ending an 11 day tour of USSR. A communique issued by both Governments calls for increased trade between the countries and envisages an agreement covering educational, cultural and scientific exchanges. The USSR has proposed an economic treaty similar to the one it has with Finland. Mr. Trudeau said the draft treaty was presented only toward the end of the visit and it needed more study.

ATTORNEYS-GENERAL MEET

Ottawa: May 31. Premier Robert Bourassa of Quebec met with Justice Minister John Turner and provincial Attorneys-General to prepare for the Federal-Provincial Constitutional Conference June 16 in Victoria. Mr. Bourassa attended the meeting as his province's Minister of Inter-Governmental Affairs. The main purpose of the meeting was to review previous constitutional negotiations and prepare an agenda for next month's session. Premier Bourassa dined with Prime Minister Trudeau to discuss constitutional issues.

BY-ELECTION RESULTS

Ottawa: May 31. New Democrats created the only upset in four federal by-elections, winning the Ontario riding of Brant from the Liberals. Derek Blackburn, a 36 year old school teacher took an early lead. He never relinquished to win the seat. The Liberals retained two Quebec ridings—Claude Lajoie, 43, winning Trois Rivieres and Yvon L'heureux, 57, winning Chambly while 34 year old Elmer Mackay held on to the NS riding of Central Nova for the Conservatives. The Socred Party, with candidates in all but the Chambly contest, won nothing. Standings in the Commons now are Liberal 151, Conservative 72, NDP 24, Socred 13, Independent 2, Independent Liberal 1 and vacant 1—Total 264. The only vacancy now is the Saskatchewan riding of Assiniboia, where the Government does not plan a by-election until after the June 23 provincial general election.

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