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Laser light increases computer's capacity to think

Alex Szabo, a physicist with the National Research Council (NRC) in Ottawa, has developed and patented techniques which some consider could revolutionize the computer industry and create a business worth literally billions of dollars within the next decade. His discovery, "optical hole-burning", which was an offshoot of his 15-year investigation in an esoteric field known as "the laser spectroscopy of solids", may be used to construct a powerful and sophisticated computer memory.

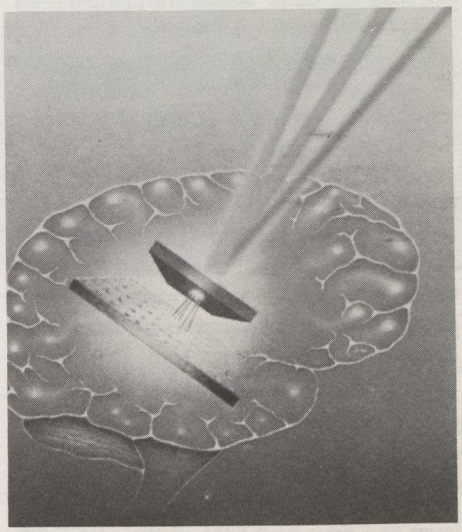
While the earliest computers worked only with numbers, computers today listen to language and shuffle text. At their deepest level, however, even their "non-numeric processing" capability still uses numbers.

"Thinking" computers

The "fifth generation" machines of tomorrow will not seem like mathematical drudges to their users. Such machines will be asked to reason, to learn, and to perform billions of operations at incredibly high speeds. User-friendly abilities will include comprehending and translating spoken languages, and reading maps, photographs and handwriting.

Researchers are agreed that fifth generation computers will amost certainly rely on innovative computer architecture known as "parallel processing." The present dominant design is "von Neumann architecture", named for mathematician John von Neumann who described it near the end of the Second World War. In the von Newmann approach, data and instructions must flow between a computer's central processor and its memory along a single channel. This single channel creates a bottleneck which limits the computer's speed and capacity. In parallel processing, on the other hand, many processors, each with its own memory channel, operate simultaneously on various parts of a problem.

Parallel processing is already found in Canada's *Cray-1* supercomputer, a "fourth generation" computer inaugurated in Montreal in February 1984 as the country's central weather forecasting computer.



John Bianchi

Stylized depiction of how a fifth generation computer might store a million billion bits of information — the number of litres of water in Lake Superior — in a space one centimetre square.

Modelling the earth's atmosphere for weather forecasting is one of the classic computer problems and provides an excellent demonstration of the power of parallel processing. In forecasting models, the earth's atmosphere is divided into a giant three-dimensional grid. Data are collected for each of the points where the grid lines intersect, and then the parallel processors perform similar calculations on each of these data points to march the model forward in time and predict the weather.

The number of calculations is extensive. Even for supercomputers like those in Montreal with lightning-fast speed of 50 million arithmetical operations a second, a ten-day weather prediction takes seven hours of computer time and involves in the order of 10^{20} calculations.

Light to replace circuits

Dr. Szabo is one of many experts who suggest that the complexities of full parallel processing may pose intractable problems for computers based on electronic circuitry and that optical computers, where beams of

External Affairs Canada Affaires extérieures Canada

light replace circuits, may be the only feasible way of building such advanced capabilities. For Dr. Szabo, his powerful optical memory is the first clear demonstration of this potential, and promises to provide the storage capacity required by parallel-processing architecture.

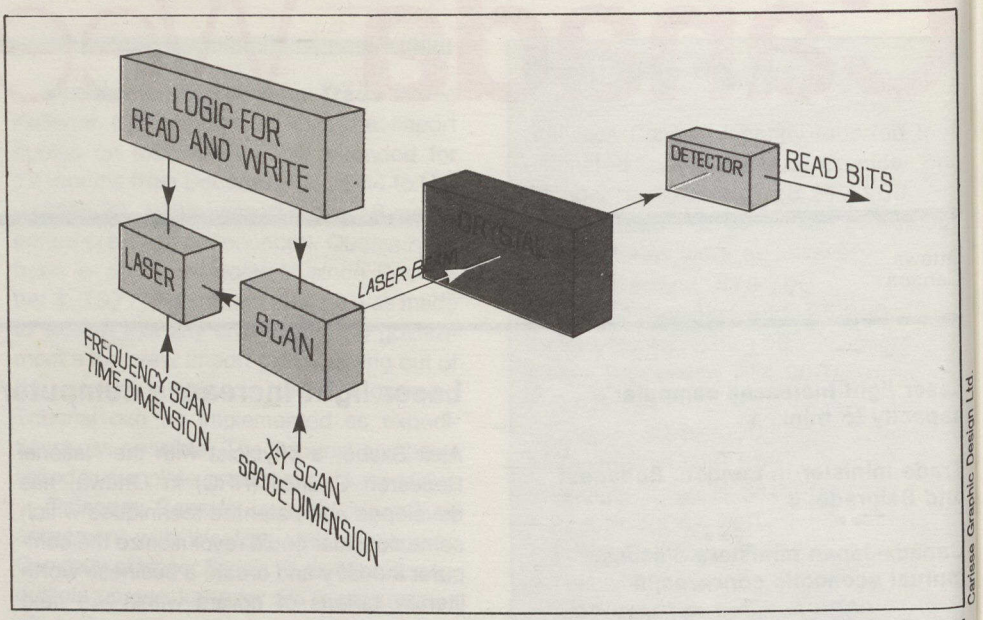
His invention is based on the fundamental physical properties of matter and light. A prism, for example, demonstrates that sunlight contains the rainbow of colours or frequencies which make up the visible spectrum. Thus a leaf appears green because its chlorophyll reflects back the green light and absorbs the other visible frequencies.

At the atomic level, the interaction of light and matter is more complicated. An atom can be considered to consist of a nucleus surrounded by electrons in discrete orbits or energy levels. If an electron is given the precisely correct amount of energy, it will jump to a higher energy level, absorbing the activating energy in the process. It is however unstable at the higher energy level. When it falls back to its ground state or original energy level, it gives off the energy it absorbed in the form of light. The precise frequency of this light will depend on the difference between the two energy levels. The clearest everyday demonstration of this is in fluorescent lamps, where electrical energy pushes electrons to a higher energy level and they emit light as they fall back.

Dr. Dzabo's optical memory relies on these basic physical principles of the electromagnetic spectrum and of atomic absorption and emission.

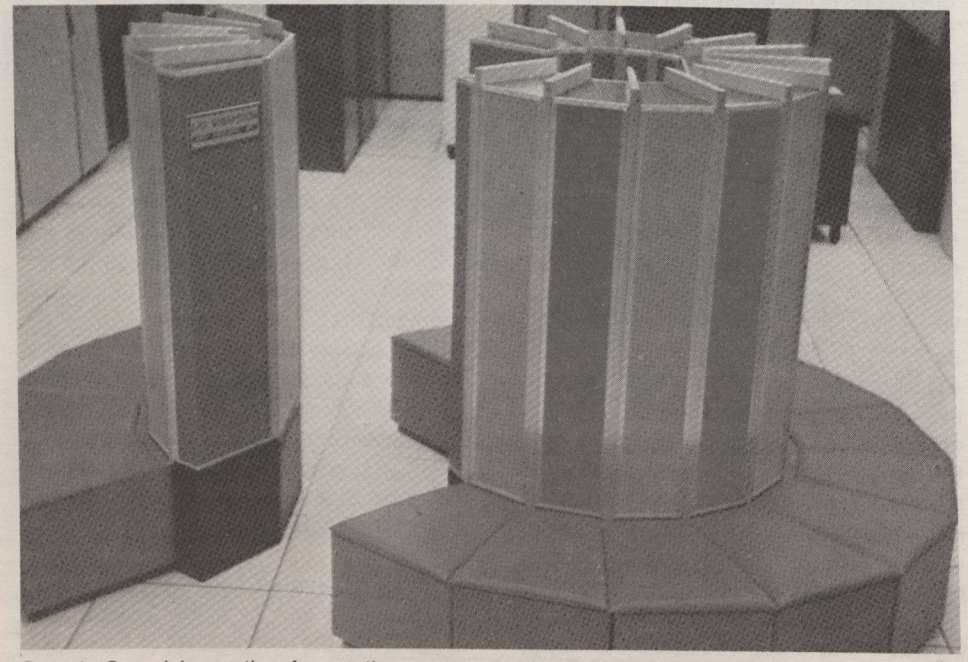
The first experiments by Alex Szabo began in 1970 when he shone light from a pulsed ruby laser into a ruby crystal and observed the fluorescence coming out.

To Dr. Szabo, this immediately suggested the analogy of an extremely high resolution colour photograph. Just as a photograph records colours, the ruby was able to store two very narrow and close frequencies of light. Moreover, once the electrons were in the excited state, he found that the ruby was transparent to a laser pulse of the same frequency. Rather than absorbing the light, it transmitted it.



Crystal memory as it would be used in a fifth generation computer. Under the direction of the computer's read-write logic, a small laser scans the memory crystal, saturating tiny areas with its light. This is the "write" function. For the "read" function, the laser scans the crystal again; a saturated area or 'hole' transmits the laser light, while unsaturated areas do not.

As the phenomenon is analogous to burning a hole in a piece of paper with sunlight focused through a magnifying glass and then shining the light through the hole, Dr. Szabo called it "optical hole-burning". And since a photographic film is really a crude sort of memory, Dr. Szabo maintains that the similar but enormously higher resolution memory made possible by hole-burning could be used to construct a more sophisticated computer memory with additional power.



Cray-1, *Canada's weather-forecasting supercomputer in Montreal, Quebec. One of the world's most sophisticated fourth generation computers,* Cray-1 *has large-scale integrated devices that give it extremely fast memory and processing.*

Computer storage capacities

The language of computers is binary — a 0 or a 1, known as a bit, is the basic unit. Eight bits, a byte, represent a letter or a number, e.g. 00101001. Two decades ago, computer data were commonly stored as holes punched in paper cards, with a capacity of about four bits per square centimetre. Gradually, this system has been replaced by magnetic tapes and discs, which can store some several hundred thousand bits in the same area.

Within the past couple of years, memories have taken another leap in storage capacity, with the introduction of video discs. These can store about 100 times more data per square centimetre than magnetic media. The bits are recorded by literally burning pits about one micrometre wide with a laser in a thin metallic film layer on a plastic or glass disc. But even this most advanced of current storage technologies pales in comparison with the capacity of as much as 1 000 trillion bits per square centimetre made possible by Dr. Szabo's invention.

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Memory from optical hole-burning

- A tuneable laser that can be adjusted to very precise frequencies (about 10 000 frequencies is the present practical limit but theoretically 10 million is possible), is shone on a selected array of spots on a slab of crystal at one colour or frequency, say red. This is the hole-burning or "write" function of the memory;
- Light sensors are arranged on another surface behind the crystal;
- Then, in order to read the memory a floodlight of the same red colour is used to illuminate the entire slab;
- The light shines through the previously burned holes but is blocked everywhere else on the crystal;
- The same procedure can be followed with different colours, green etc., in different patterns on the same crystal;
- The idea that such a memory could store as much as 1 000 trillion (10^{15}) bits per square centimetre is derived by multiplying the 100 million (10^{8}) narrowly-focused laser beams that can be accommodated in a square centimetre by the 10 million (10^{7}) different frequencies to which each of these lasers can be turned.

Greatly increased capacity

According to Dr. Szabo, "this memory will be as much as a million times bigger than conventional memories and will undoubtedly completely change the computer game". The 1 000 trillion bits which could be stored on a fingernail-sized square centimetre of material in such a memory, he points out, surpass the 100 trillion bits estimated capacity of the entire human brain.

Dr. Szabo predicts that computers with such memories will eventually be impossible for humans to program. They will require the development of a true learning algorithm or self-programming capability. And such computers, he says, will be the first true examples of artificial intelligence, of machines with the ability to learn from experience as humans do. In short, Dr. Szabo's memory may not only aid the development of fifth generation computers, it may require them.

Dr. Szabo received patents on the hole-burning memory in Canada and the United States in 1975. Recently he has succeeded with a new US patent describing both a method of sweeping the laser across the crystal for rapid and efficient writing and reading, and a technique for creating holographic movies from the crystal memory.

(Condensed from an article by Paul Tisdall in Science Dimension *1984-85.)*

Trade minister in London, Budapest and Belgrade

Canada's Minister for International Trade James F. Kelleher made his first official visit to Britain, Hungary and Yugoslavia in November.

In London, Mr. Kelleher met with representatives of the British government and business leaders, including the Confederation of British Industry. In his meetings Mr. Kelleher discussed Canadian priorities in international trade and current bilateral links with Britain, Canada's largest trading partner in Europe. He also promoted joint trade possibilities and emphasized industrial co-operation opportunities.

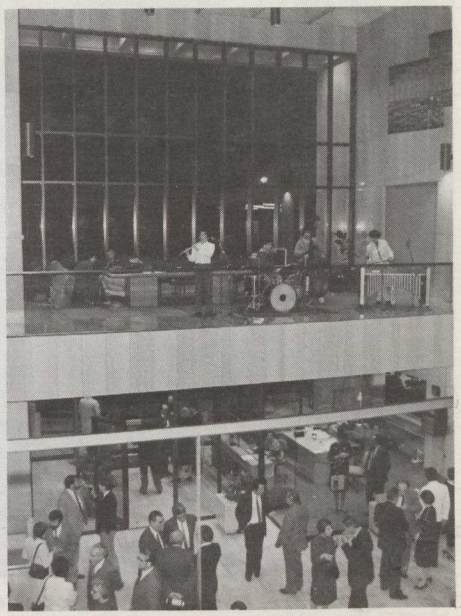
In a speech to the Canada-UK Chamber of Commerce he highlighted Canada's new approach to foreign investment and reviewed the government's November 8 economic statement. It was the first major address in Europe on economic themes by a member of the new government.

East European visit

As the guest of Foreign Trade Minister Peter Veress in Hungary, Mr. Kelleher led a Canadian delegation of businessmen and officials from governmental agencies in bilateral trade consultations. Meeting with representatives in foreign trade, industry and transport, they identified and discussed the possibilities for greater co-operation between the two countries in various economic and commercial fields.

The contacts, ranging in scope from oil and gas field equipment through articulated buses to agricultural telecommunication equipment, are expected to strengthen the bilateral trading relationship between Canada and Hungary, as well as to identify areas for commercial co-operation in third markets.

Trade Minister James Kelleher (right) *and Ambassador John Fraser at the plaque unveiling for Canada's new chancery in Yugoslavia.*



L'orchestre sympathique perform at the opening of the Canadian chancery in Belgrade.

On behalf of Canada, Mr. Kelleher signed a Canada-Hungary transport agreement with Hungary Transport Minister Lajos Urban. The agreement is for technical co-operation and exchanges in the fields of highway construction and safety, railways, urban transportation and the application of computers in transport operations.

In Hungary, Mr. Kelleher also presided over the inauguration ceremonies of the new Canadian chancery in Budapest.

During his visit to Belgrade, Yugoslavia, Mr. Kelleher officially opened another Canadian chancery and consulted with senior government officials on international economic issues. He led the delegation of Canadian business representatives interested in expanding bilateral trade opportunities.

On behalf of Transport Canada, he signed a Canada-Yugoslavia air agreement to institute regular air service between Toronto and Montreal in Canada and major cities in Yugoslavia. In addition, he signed a memorandum of understanding in the field of veterinary medicine with the Yugoslavia Federal Committee for Agriculture on behalf of Agriculture Canada.

Reflecting the importance of the cultural aspect of bilateral relations between the countries, *The Canadian Landscape,* a major exhibition of paintings from the Firestone art collection was presented in Yugoslavia. It was the first showing of an exhibition involving many important Canadian artists ever presented by Canada in East Europe.

Canada-Japan ministers discuss mutual economic concerns

Canapress

Secretary of State for External Affairs Joe Clark (right) *met with Japan's Minister of Foreign Affairs Shintaro Abe in Tokyo to discuss economic issues of concern to Canada and Japan.*

Secretary of State for External Affairs Joe Clark met with Japan's Minister of Foreign Affairs Shintaro Abe in Tokyo in December to discuss a wide range of bilateral, regional and international issues. Among the issues discussed were coal, the CANDU nuclear reactor, a liquefied natural gas project, trade and investment.

Mr. Clark pointed out that Canada had spent a great deal of money to provide facilities for the export of coal to Japan and urged Mr. Abe to recognize that Canada had done its best to become a stable supplier of coal, largely at Japanese urging. The coal market has softened markedly and Mr. Clark asked Mr. Abe to keep Canada's commitment in mind and ensure that Japan remains a stable buyer.

On the long-delayed Japanese decision about the purchase of a CANDU nuclear reactor which Japanese scientists began to study in 1975, Mr. Clark said he hoped Canada would be successful over the long-term. Mr. Abe said the Japanese feasibility study on the reactor should be finished in 1985.

Sale of natural gas

The external affairs minister said the business of liquefied natural gas sales to Japan was firmly in the hands of the private sector and must stand or fall on commercial considerations alone, but he did indicate that the government believed it would be a good project for both countries.

December 30 marked the expiration of a fourth extension potential Japanese buyers have given a consortium of Canadian sellers in the Western Canadian LNG deal, whose worth in construction in Canada alone has been put at $2.5 billion.

Delayed for five years, the Western Canada LNG deal is expected to bring in thousands of jobs to British Columbia and millions of dollars into a disappearing Canadian trade surplus with Japan.

Increased trade

As to trade, Mr. Clark said "there should be no problems with free trade between Canada and the US as far as the Japanese are concerned". He said that "Canada will be as open to Japanese investors as to Americans" and that Japan could also increase their trade in the United States as they "would be free to access the US market through Canada".

Mr. Abe was quoted by a Canadian official as having said that Japan was "particularly interested and most appreciative of deregulation of investment in Canada".

Further trade discussions

Mr. Clark also met with Minister of International Trade and Industry Keijiro Murata and discussed Canada-Japan trade in resource products, manufactured goods, and technology.

Mr. Clark emphasized the desire of Canada to export manufactured goods as well as resource products. He cited the recent statement by Prime Minister Brian Mulroney that "Canada is open for business" and added that substantial changes would result from the new Investment Canada Act, which he said was a positive indication of the priority the Canadian government attached to attracting foreign technology and capital.

Mr. Clark stated that he was heartened by growing Japanese interest in investment in Canada and welcomed Japan as a long-term partner in Canada's economic growth. He said that Japan had considerable leadership in production and is growing in product technology, and he therefore hoped to see increasing co-operation between Canadian and Japanese companies, and in Japanese investment in Canada.

Research award

As a step to strengthening Canada's academic relations program and to develop a greater understanding of Canada in Japan, Mr. Clark announced in Tokyo the establishment of an annual institutional research award to be called the Canada-Japan Research Award. The award will provide $50 000 to a Japanese organization or institution undertaking original research concerning Canada or Canadian relations with Japan.

Academic relations programs between the two countries have as their origin an agreement signed in 1974. Canada's academic involvement in Japan includes, *inter alia,* financial support for two visiting professors of Canadian studies, a faculty enrichment program for Japanese academics, a reciprocal scholarship program involving the two countries, a university book donation program in support of teaching about Canada and provision to certain Japanese universities of selected Canadian government publications and materials.

The new award will complement existing programs and encourage and facilitate publication of Japanese-language materials on Canada or the Canada-Japan relationship.

Bilateral talks with EC

The twenty-third round of Canada-European Communities (EC) semi-annual consultations were held in Ottawa on November 29-30.

The consultations, which have been an important element of Canada's bilateral relationship with the EC since 1967, provided an opportunity for the representatives to discuss issues of concern to both sides.

The EC, comprising the ten member states — Belgium, Denmark, France, Federal Republic of Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, and the United Kingdom — is Canada's second largest trading partner. It represents a market of some 270 million consumers and is scheduled to grow to 310 million in 1986 following the expected entry of Spain and Portugal. The EC is also the second largest source of investment capital and destination for Canadian investments abroad.

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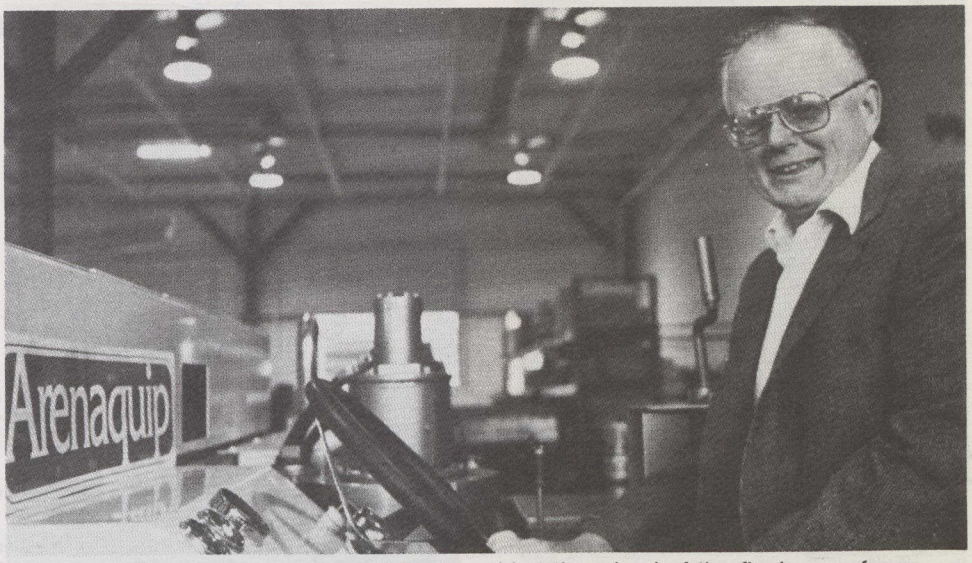
Diversity delivers dividends



François Bollinger, the president of Erectoweld at the wheel of the firm's resurfacer.

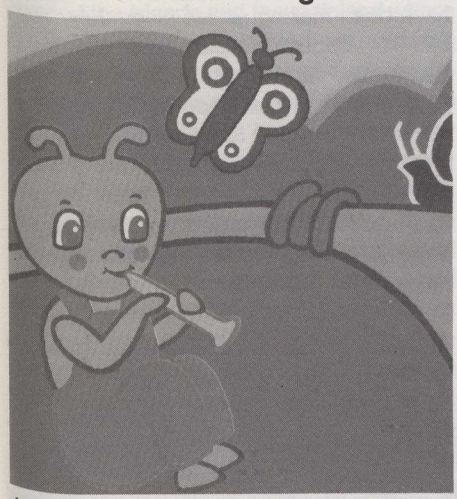
An Oakville, Ontario company, Erectoweld Co. Ltd., owes its success of some $10 million in sales this year to the diversity of its products. Starting as a fabricator of high-pressure pipes in 1963, today Erectoweld is the parent company of a number of divisions employing 85 people at three locations in Oakville and 15 people in its US operations in Waukeshaw, Wisconsin.

Through its divisions it still manufactures high-pressure pipes for the petrochemical industry as well as forged forks and other attachments for lift trucks used in factories and warehouses.

Its Arenaquip Division manufactures ice resurfacers and other equipment for ice arenas and its Aquamarine Division is described as the world's largest manufacturer of aquatic plant harvesters used in many countries to clear rivers, streams, lakes and harbours of water weeds and other plants. Aquamarine is Erectoweld's newest acquisition and the company expects their sales of products in the area to jump from $800 000 in 1983 to $3 million in 1984.

According to François Bollinger, the president and one of the founders of Erectoweld, about $6 million of their 1984 sales were in the US, Europe and the Pacific rim. The company has been actively engaged in expanding its overseas sales and was involved in eight trade shows last year.

Mimi makes learning fun



A new computer program designed for children two years old and over has recently been introduced in Montreal, Quebec. Created by teacher Anne Bergeron for Logidisque Inc., the software program is believed to be the first one developed for children so young.

The Adventures of Mimi the Ant and her friends — the lady-bug, snails and butterflies — was designed for the *Commodore 64* computer. Each letter of the alphabet on the computer represents a different function that Mimi can perform and each one is accompanied by a short nursery rhyme, folk song or classical melody. Push "B" and butterflies flutter through the air; push "D" and Mimi dances; push "F" and Mimi plays a melody by Bach on her flute; or press "N" and night falls as Mimi goes to bed to the tune of *Au Clair de la Lune.*

Mimi has a night-time setting as well as a morning one and the child can speed up or slow down any one of the scenes. Older children can program Mimi to perform a series of 125 different functions. By pushing the letters "S", "D" and "T", for example, Mimi will climb into bed and sleep, float dreamily through the air and return to her bed just as a thunderstorm erupts — all to the sounds of accompanying music.

First developed in French in 1982, the program was created by Mrs. Bergeron to satisfy her own two-year-old daughter's curiosity about the computer. The program has already enjoyed considerable success among French-Canadian and European children and in 1984 won the jury's special prize at the International Software Festival held in Avignon, France.

The success of Mimi, a floppy disc that retails for $35, has helped Logidisque win two important contracts in Britain and France, that could be worth up to $4 million over a two-year period, said company president Louis-Philippe Hebert.

"The contracts are for our entire range of 40 programs. These range from small computer games for the *Vic 20,* which retail for $15, to word-processor systems for the IBM pc worth $400," said Mr. Hebert.

Teacher Anne Bergeron, the creator of the software program, The Adventures of Mimi.

Highest bravery award

The Cross of Valour, Canada's highest civilian award for bravery was presented to René Jalbert, the sergeant-at-arms at the Quebec National Assembly, by Governor General Jeanne Sauvé.

Mr. Jalbert, a veteran of the Second World War and Korean War, received his award for subduing a gunman who killed three people and wounded 13 others with a hail of machine-gun bullets in the Quebec National Assembly. Entering a room where the man had taken refuge, Mr. Jalbert first convinced him that he should let several employees leave and then he spent four hours convincing the man to surrender.

Nine other people were honoured at the ceremony as recipients of the Star of Courage and another 19 were awarded the Medal of Bravery.

Since the awards were established 12 years ago, 835 have been presented.

United Press Canada Limited

René Jalbert receives Canada's highest award for bravery from Governor General Jeanne Sauvé.

Computerized laundries help to sort out wash

A Montreal consulting company that designs automated processes for industry has developed two computerized systems that it claims can save commercial and institutional laundries up to $100 000 a year.

One of the systems, the Exactcount-045, developed by Entreprise Electronique D.S. Inc., is a microprocessor-based laundry sorting system that includes a series of four infrared light frames and 11 high-speed conveyor belts.

Michel Simard, vice-president of the company, said the sorter can help sort up to 3 630 kilograms of laundry an hour. "The automated sorter changes the entire way of doing work in the laundry," he said.

Workers in large laundries now weigh and sort laundry by hand when it arrives at the plant and customers are billed on a per kilogram basis at the end of each week.

Increased productivity

With the new sorter one employee enters the customer's account number into the computer via a terminal, and then two other employees toss the laundry onto different conveyor belts moving at 65 metres a minute. Each piece of laundry is counted as it passes through an infrared light frame and travels to large bins behind the stainless steel structure. The sorter, using a three-channel multiplexor, keeps track of up to 45 different laundry items as they move through the system.

When the sorting is completed, an instant print-out lists all laundry received. This enables the company to bill customers as each batch of clean laundry is delivered.

Entreprise Electronique D.S. has sold five of the systems in Quebec. One was installed at Hector Jolicoeur Inc., one of Quebec's largest and oldest commercial laundries. Germain Lemire, president of Hector Jolicoeur, said plant operations had improved considerably since the sorter was acquired early in 1984.

Before the system was installed at the laundry, eight employees sorted incoming laundry, but now no more than three perform the task. Because the sorter increased production capability the employees were transfered to other stations.

Washing machine control

The other computerized system, the Ramses-65, controls large commercial washing machines. It can be programmed to memorize up to 15 different sets of washing instructions and controls water temperatures and the quantities of detergents and bleach introduced automatically into the machine.

Mr. Simard said the system, which costs $5 000 to $7 000, was designed to replace aging electromagnetic controls on older models. It also saves heat, hot water, detergent and bleach, and eliminates employee error. With the electromagnetic controls, one employee operates two washers, but with the computerized controls one employee can manage up to ten machines.

Pizza pizzazz

Two Vancouver salesmen and an accountant are attempting to revolutionize the take-out and delivery pizza industry in the city through a simple "one-call, one-pizza" concept. With only one telephone number, Jeet Mandair, 32, Frank Evanshen, 35 and Brian Kreiter, 30, are claiming to sell pizza more conveniently and consistently using computer communications technology.

When an order is received at the company's headquarters, a telephone operator enters it into a computer terminal. The computer looks at the address and telephone number of the order and assigns it to the nearest Pizza 222 location for preparation and delivery.

The one-call, one-pizza concept is credited to a Toronto company, Pizza Pizza Limited, by the group. "I feel very strongly that what's happening with Pizza 222 and with Pizza Pizza in Toronto is revolutionizing the take-out, delivery pizza business. I think you will see some major changes because of this concept spreading through North America," said Frank Evanshen.

The group, incorporated in March 1984 have been making pizzas since July. They had 16 Vancouver locations by the end of September with 13 of them franchised.

The average investment from a franchise-holder in Pizza 222 is $40 000, including a first-time franchise fee. Revenues of 12 of the 13 franchises were $12 000 in August, the second full month of operations. Telephone headquarters have processed as much as $10 000 in orders in one day.

Winterlude's a winner

Ottawa's annual winter festival, Winterlude, was selected as one of the top 100 tourist events in North America by the American Bus Association.

The association is made up of more than 2 000 North American bus companies and tour operators. The top 100 attractions are chosen by a committee of about ten people in the association from a list of more than 300 attractions submitted by individual states and provinces.

Association spokesman Maggie Staib said factors that go into the choices include how unusual an event is and whether it has developed an international reputation or is just a "local event". She said events from seven Canadian provinces made the list, with a total of about 14 Canadian attractions.

The 1985 festival, to be held February 1 to 10, will include ice sculptors from Japan.

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World of the Raven people revealed in new hall

A new permanent display entitled *Raven's World,* which will ensure representation of the native cultures of Canada's Pacific coast without risk to the artifacts, was recently opened at the National Museum of Man in Ottawa.

The objects in the new Pacific coast hall were selected for their ability to withstand environmental fluctuations in temperatures and humidity that had begun to endanger artifacts in the *Children of the Raven* hall and led to its closing in 1981. Some of the artifacts that are too fragile have been replaced by photographs or copies.

Supernatural beliefs

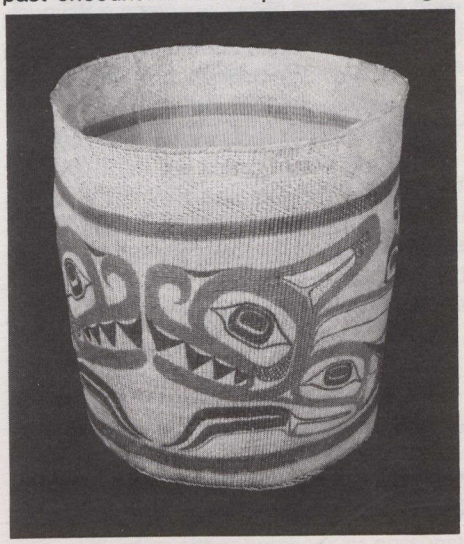
For Canada's Pacific coast people, life revolved around a belief in the supernatural character of plants and animals. In a world of forest, beach and ocean, every aspect of nature had its spiritual side. For instance, salmon lived as people in their own domain. At spawning time they assumed the guise of fish and gave their outer selves to the people as food.

There was the belief that long ago Raven created the islands and the mainland where the Pacific coast people lived. He arranged to be born to the daughter of a chief who lived in the sky, and, as her infant son, he stole the box in which her father kept the daylight. At the mouth of the Nass River he opened the box and brought the sun to the world. Raven was the bird croaking in the forest behind the village, a man who could accomplish what no other man could, a fool whose deceptions and mistakes were as outrageous and comic as his accomplishments were great. He moved through a world in which salmon and sea otter, bear and mink, were both animal and person. The human beings who were his children came out of the cockleshell into this world.

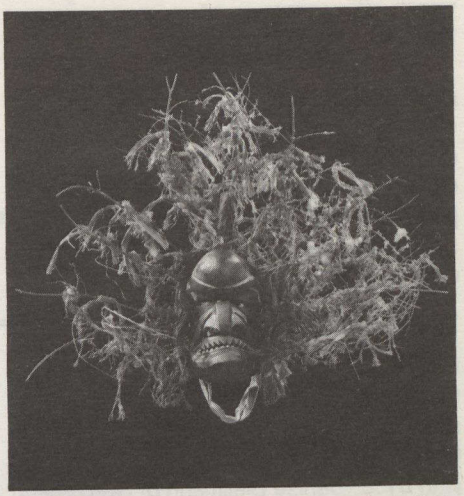
A view of life

In addition to reflecting the beliefs of the Pacific coast peoples, various aspects of everyday life on the west coast are highlighted. Hunting and fishing practices are aptly illustrated.

Tools and domestic items representing a late nineteenth century Haida household are also displayed. Interior posts which supported the house rafters, and memorial totem poles outside, were carved with family crests. On the northern coasts, ancestors passed to their descendants emblems of past encounters with supernatural beings.



Spruce root basket by Isabella Edenshaw from the McCord Museum collection.

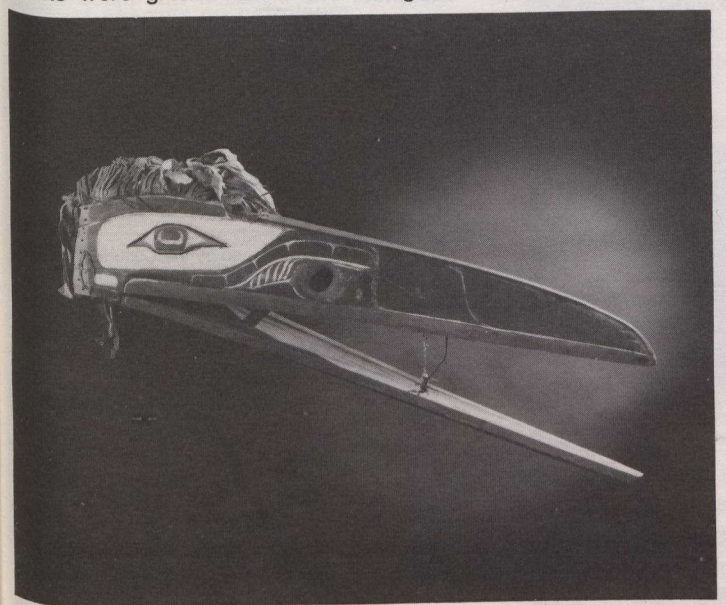


Kusiat mask representing thunder. It is made of wood with leather tongs and twigs that are painted and decorated with cedar bark and eagle down.

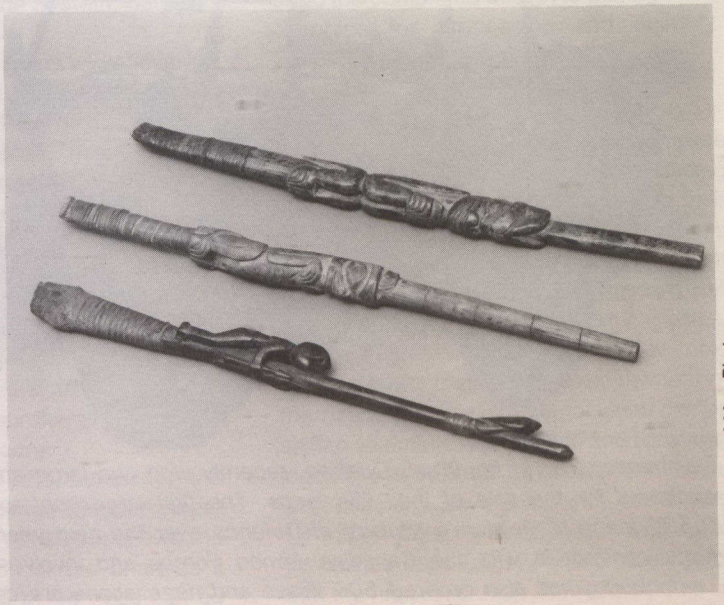
A family of the Eagle Clan might have the crests of raven, beaver or frog which serve as records of their history and identity.

Sculptors and painters in each coastal region developed their own complex styles to interpret the supernatural world and the relationship between human and supernatural beings. Traditionally, men were the carvers and painters, while women expressed their art through weaving and basketry. Red and black were the principal colours used, with the oval being the basic form.

Because of environmental restrictions, *Raven's World* can only offer visitors a small taste of the rich cultural history of Canada's Pacific coast. However, in the plans for the new National Museum of Man, to be opened at Parc Laurier in 1988, is a major exhibition of Pacific coast Indian life with the proposed grand hall re-creating the cedar plank houses and coastal villages of the people.



Raven Hamatsa mask of Kwakiutl in wood, cedar bark hair, and paint.



Paintbrushes of wood and porcupine quill bristle wrapped in roots.

National Museum of Man Photos

Pro skate winners

Canadians Lynn Nightingale of Ottawa, Ontario, and the husband and wife team of Candy Jones and Don Fraser of Montreal, Quebec, won the women's and pairs championships respectively at the $50 000 Pro Skate championships held in New York City in December.

Canada's national women's champion 1974-77, Miss Nightingale, received $8 000 with a well-executed traditional program that earned her 68.4 points out of a possible 70.0. The defending champion Angela Greenhow of Great Britain placed second with 67.9. Denise Biellmann of Switzerland was third with 67.4.

Since turning professional in 1976, after winning the Canadian pairs title for the third successive year, Candy Jones and Don Fraser have been undefeated in pro competition and they extended that streak with an uplifting athletic program full of spins, throws and jumps that earned them a 69 mark with one perfect 10 from a judge.

Jo Jo Starbuck and Ken Shelley of the United States finished second with 68.7 breaking a tie on technical points with Americans Tai Babilonia and Randy Gardner, third with the same score.

In the men's event, Toller Cranston of Toronto came second with 68.8 points and Brian Pockar, also of Toronto, third with 68.5. Robin Cousins of Great Britain won the event.

News briefs

Secretary of State for External Affairs Joe Clark has announced that direct development aid to El Salvador, suspended in 1982 because of the guerilla war in the Central American country, will be restored. The Canadian International Development Agency (CIDA) has been authorized to begin negotiations with El Salvador. Canada is also concentrating on aid and development in Nicaragua, and encouraging the four Central American countries as they try to find an enforceable peace plan for the area.

The Export Development Corporation (EDC) has announced the signing of a $5-million (US) line of credit agreement with Deutsche Aussenhandelsbank Aktiengesellschaft (DABANK) of East Berlin to support sales of Canadian capital goods and sevices to the German Democratic Republic. The line of credit agreement will assist Canadian exporters competing for sales in GDR by providing their buyers with a simple and easily accessible credit facility through the bank. EDC expects that the main application of the line of credit will be to support small- and medium-sized export sales to various foreign trade organizations of the GDR. The sales contracts will be considered on a case-by-case basis.

Statistics Canada reports that Canada's gross national product (GNP) rose 1.4 per cent in the third quarter of 1984 to a level of $425.4 billion, seasonally adjusted at annual rates. After allowing for a 5 per cent decline in over-all prices, real GNP increased 1.9 per cent, more than double the .8 per cent average increase of the first two quarters. About half of the strong growth in economic activity was due to increased real net exports of goods which rose by 8.6 per cent. This strength was most notable in motor vehicles and parts, but there was also considerable growth in wheat, woodpulp, lumber, newsprint, aircraft engines and parts and some electrical equipment.

Spar Aerospace Limited of Toronto, Ontario is currently involved in three space projects for the federal government. The projects include: a $14.7-million contract for the definition phase of a satellite that will scan earth pressures, measure ice thickness, define icebergs and determine ice flows in Canadian shipping lanes; a $2.5-million contract for development of a computerized TV system that will be installed on the Canadarm of the US space shuttle; and a $1.5-million contract to study potential Canadian participation in the US aeronautical space station project.

Justice Minister John Crosbie has announced that two search and rescue ships will be built to patrol off northeastern Newfoundland. The cutters will have reinforced hulls so they can operate in ice. They will be based in Twillingate and St. Anthony to assist the inshore fleet. Construction will begin in the spring and the vessels should be ready for patrols by the fall of 1986. The cost of each vessel is estimated at $5 million.

Canada's offer to host the eighteenth annual session of the Conference of Ministers of Youth and Sports of French-Speaking Countries (CONFEJES) in 1987, has been accepted. The invitation was made at the fifteenth annual session held in Libreville, Gabon, October 29 to November 3, 1984. The session will be organized by the federal government and the Quebec provincial government. Twenty-six French-speaking countries are members of the CONFEJES.

Jump in jeep sales to home and overseas markets

Bombardier Inc. of Montreal, Quebec, recently won two large and a number of smaller contracts for the sale of their Iltis *jeeps. The first large contract, is for the supply of 2 500 jeeps to Belgium's Ministry of Defence over the next year and a half. The other large contract is with the Canadian Armed Forces and involves 1 900 of the jeeps. Luxembourg has also ordered 500* Iltises *and negotiations are currently underway with West Germany for a further order of 250 vehicles.*

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