

# Canada Weekly

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## Commercial Products' story – the development of medical therapy for millions

Commercial Products, which has been recognized during its quarter-century of existence as a world leader in the field of radiation technology, came into being in 1946 as a division of Eldorado Mining and Refining Company Limited, a crown corporation formed during the Second World War to control Canada's uranium resources. The main task of CP, under its founder Roy Errington, was the marketing of radium used in cancer treatment. Towards the end of 1948, the stock of radium had become practically used up.

As early as 1945, J.S. Mitchell and J.V. Dunworth had recognized that cobalt-60 would have useful medical applications. Though they discussed its potential use with associates, they lacked a reactor with a high density of neutrons (high neutron flux) to convert ordinary cobalt to cobalt-60. The required flux became available when the NRX reactor was brought into service in July 1947.

Errington's group took on the task of

designing and building an entirely new product, the therapy unit, a device needed for the use of this new source of energy. The personal confidence of Dr. Ivan Smith, expressed by a firm order for a unit to be installed at London, Ontario, did much to bring this venture to fruition.

Meanwhile, another Canadian pioneer, Dr. Harold Johns of the Saskatchewan Cancer Clinic, was busy preparing a machine for his own use. Cobalt-60 sources for both these units were produced at Chalk River, Ontario.

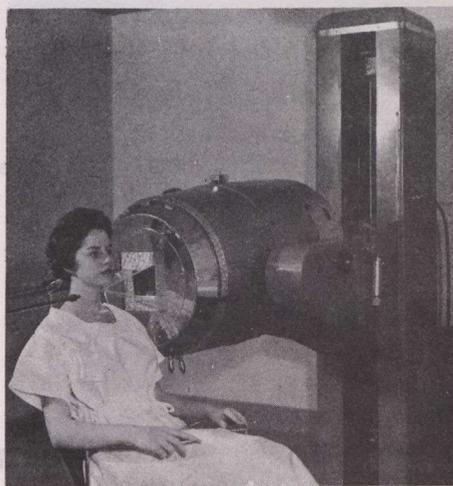
### Historic day

Finally, the history-making day arrived and the world's first commercial cobalt-60 teletherapy machine, the Eldorado A, was commissioned on November 12, 1951, at the London Clinic of the Ontario Cancer Foundation, Victoria Hospital. Subsequently, 50 Eldorado A units were built and sold by Commercial Products and many are still in service. From this humble beginning came 1,500 AECL cobalt-60 teletherapy units installed in 73 countries and providing therapy treatment for millions of patients.

During this early period, CP occupied some interesting premises, starting life in Number 3 Temporary Building on Wellington Street in Ottawa. During the development of the Eldorado Model A., CP moved to "spacious" new facilities in the basement of the R.A. Beamish store on the Montreal Road. It also had a workshop in a small garage. In 1950, an isotope catalogue had been produced and the processing of orders was handled by a special-products group at Eldorado Mining and Refining in Port Hope, Ontario.

### AECL takes over

With the formation of Atomic Energy of Canada Limited in 1952, Commercial Products became a division of the new company. The production unit was moved to new rented quarters, built to its own specifications, in the west end of Ottawa. The total staff at that time was 20. In 1953, another CP group was



*Two Canadian cobalt-60 cancer therapy machines were the first in the world to go into service. Above is the unit developed by the Commercial Products division of Eldorado Mining and Refining Limited (the division in 1952 became part of Atomic Energy of Canada Limited, established that year) and put into operation on November 12, 1951 at the London Clinic of the Ontario Cancer Foundation, Victoria Hospital.*

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formed at Chalk River to expedite the production and shipping of the rapidly-increasing number of isotopes required by industry, medicine and research.

In 1954, a new building was completed at Tunney's Pasture in Ottawa, and the sales, administration and isotope-production groups were brought together for the first time. By 1955, CP employed 175 people located in the two buildings in Ottawa. The radium group had moved up from Port Hope and the isotope group had moved down from Chalk River.

The range of cobalt-60 teletherapy units expanded into Theratrons (rotational machines) and Eldorados (stationary machines). The various models produced began to use up the alphabet. The Eldorado Model A was followed by the Theratron B, Theratron Junior, Caesatron (a unit employing a caesium-137 source, used primarily for head and neck treatment), Theratron F, Eldorado G, Eldorado Super G, Theratron CII, and a new generation of units: the Theratron's 60 and 80 and Eldorado's 6 and 8. The later group of units proved to be particularly popular and several hundred were sold to other countries. Current production includes the new sophisticated Theratron 780 and Eldorado 78.

Each successive unit reflected the current advances in technological design. In 1968, the Therasim, a teletherapy simulator used in the preparation of precise treatment prescriptions, was added to the line. This was followed by the TP-11, a computerized treatment-planning system capable of preparing, in seconds, complex, highly-accurate, teletherapy-treatment plans.

#### Accelerator production

In the late Sixties, it was realized that CP's competitors were making considerable gains in the cancer-treatment market by offering medical linear accelerators. These are high-voltage therapy units employing electron and photon beams rather than gamma rays, as in cobalt-60. In order to offer a complete teletherapy line of equipment, Commercial Products decided to enter this new and highly-complex field. Having little previous experience with medical accelerators, CP in 1972 decided to make a development, production and marketing agreement with CGR-MeV, a company with consider-

#### Cancer patterns in Canada, 1931-1974

Cancer is the leading cause of loss-of-life-expectancy for Canadian women and the third most frequent cause for men, according to *Information on cancer patterns in Canada from 1931-1974*, a report released on May 20 by Health and Welfare Minister Marc Lalonde.

Breast cancer, the most frequently occurring type among Canadian women, is responsible for about 3,000 deaths a year and 23 per cent of the loss of female-life expectancy due to cancer. Lung cancer, the most frequent type in Canadian men and the third most in women, was responsible for all of the large increase of the cancer death rate for Canadian men during the past 25 years. Cancer of the large intestine ranks second in frequency for both sexes.

able accelerator expertise based in Paris.

The first AECL-manufactured linear accelerator, the Therac 6, was installed in November 1975 at the London Clinic of the Ontario Cancer Foundation, Victoria Hospital — a case of history repeating itself. Today CP is shipping and installing medical accelerators to customers in many parts of the world.

On the ground that "the more people investigating gamma irradiations, the greater likelihood of commercial processes evolving", AECL introduced the Gammacells in 1958. These are self-shielding units that can be installed in unshielded laboratories. The Gammabeam version employs an exposed source for panoramic irradiation and requires a shielded room. Some 321 Gammabeams and Gammacells are now serving research projects in 41 countries.

#### Mobile irradiator

In 1961, CP placed on the road a mobile irradiator equipped with 40,000 *curies* of cobalt-60, intended primarily for the irradiation of potatoes but subsequently used to irradiate a number of different foods. It was employed for extensive field tests in the Maritimes and Ontario, and was also leased to the United States Department of Agriculture for test irradiation of fruit and vegetables in the Fresno, California area. Cobalt-60 irradiation inhibits

sprouting in potatoes and decay organisms in other foods, thereby increasing their "shelf-life". These tests led to the sale of irradiated potatoes in Canada for a short time — a first for any Western country. The irradiation of foods proved feasible as a process, but economic reasons, particularly in Western countries, rule out its use at present.

The experience gained with the mobile irradiator served AECL well in the design of an automatically-controlled irradiation facility for the sterilization of disposable medical products. Early units were installed at San Angelo, Texas, for Ethicon and at Upper Hutt, New Zealand, for Tasman Vaccine Laboratory Limited. The units are used to sterilize nearly 200 items, such as



*Commercial Products' Therac 6, the first linear accelerator for cancer therapy, was installed in the London Clinic of the Ontario Cancer Foundation, Victoria Hospital, in November 1975. Today CP is installing medical accelerators in many parts of the world.*

sutures, blood kits and bandages, after they have been packaged for shipping. They have made rapid inroads into a sterilization field previously dominated by the ethylene-gas method. Forty-four plants round the world supplied by AECL constitute over two-thirds of all such facilities in existence. The larger units now being installed have a capacity of up to two million *curies* of cobalt-60.

Since the late Forties, CP has become a world leader in the supply of bulk radioisotopes to the pharmaceutical industry. It is interesting to note that at that period CP sold iodine-131 for medical purposes at \$1.00 a *millicurie* but today, owing to increased effi-

### Sixth session of the Law of the Sea Conference

The Canadian delegation to the sixth session of the Law of the Sea Conference, which opened in New York on May 23 and will continue until July 15, is headed by Ron Basford, Minister of Justice and Attorney General, and Roméo LeBlanc, Minister of Fisheries and the Environment. J. Alan Beesley, Assistant Under-Secretary of State for External Affairs and Legal Adviser to the Department, is deputy head of the delegation.

The current session of the Law of the Sea Conference occurs during a critical phase in these long and difficult negotiations. Though the previous session ended in an impasse on the issue of the rights to explore and exploit deep-seabed resources beyond the bounds of national jurisdiction, significant progress has been achieved on most of the other key issues, including: general agreement in favour of the principle of the common heritage of mankind in respect of deep seabed resources; a 12-mile territorial sea; the idea of the 200-mile economic zone, including coastal-state sovereign rights over living and non-living resources and jurisdiction over the prevention and control of marine pollution. Canada's action, like that of many other countries, to extend its fisheries zone to 200 miles was based on the emerging consensus regarding an economic zone of this width.

This significant progress, which has already contributed to a radical revision of the law of the sea through state practice, must still, however, be translated into a convention commanding universal support. Before such an instrument can be adopted, the Conference has to resolve the outstanding, and most difficult, issues — in particular the regime applicable to the deep seabed beyond national jurisdiction. There are still differences of opinion on the question of access to the deep-seabed mineral resources by private and state entities, on the one hand, and, on the other hand, an international organization that is to be established under the terms of the hoped-for law-of-the-sea convention. Discussions held between sessions of the Conference have produced, for the first time, a constructive exchange on this issue

that gives solid ground for believing that an accommodation between opposing views will be realized at the next session. Nevertheless, tough negotiations lie ahead on this and related issues, as well as on such other questions as marine scientific research in the economic zone, coastal-state powers to protect the marine environment, the rights of landlocked and "geographically-disadvantaged" states and settlement of disputes.

In the light of the progress already made, and without minimizing the difficulty of the problems still to be solved, Canada remains committed to the realization of a new, comprehensive law-of-the-sea convention, and the Canadian delegation will be working energetically to that end during the present session.

### Canada's views on international water-quality report

The Department of External Affairs announced on May 20 that the Government of Canada had conveyed to the International Joint Commission a com-

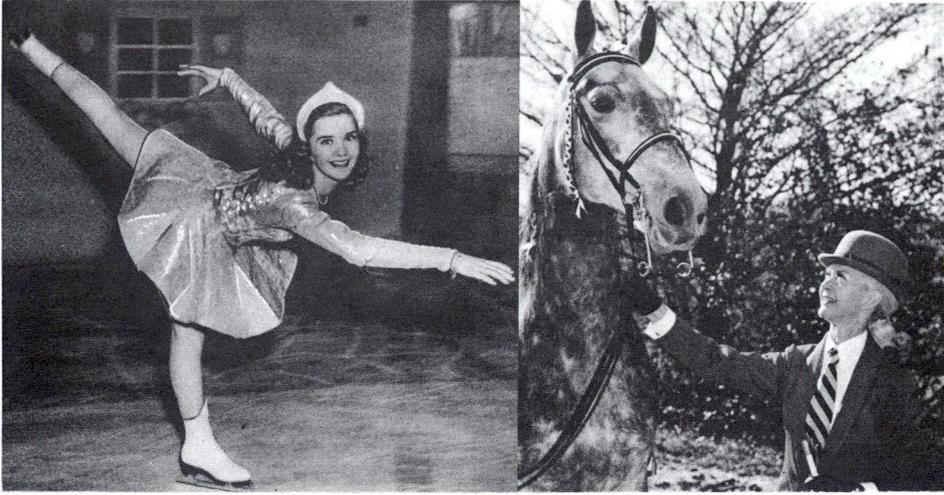
bined Canadian response to the recommendations to governments contained in the Commission's fourth annual report on Great Lakes water quality. The report identified several of the recommendations in the 1975 report of the Great Lakes Water Quality Board to which the Commission believed the parties to the 1972 Great Lakes Water Quality Agreement should give priority consideration.

The Government of Canada and the Ontario government recently completed a comprehensive review of Great Lakes water-quality matters in the light of the IJC report. The two governments recognize the importance of the concerns addressed in the recommendations. Their combined response informs the Commission of the specific status of Canadian federal and provincial programs and other measures in recognition of these concerns. The response also reaffirms that the federal and Ontario governments continue to give high priority to Great Lakes programs and to encourage co-operation at all levels of government in order to reach the water-quality aims of the Canada/United States Great Lakes Water Quality Agreement.



Secretary of State for External Affairs Don Jamieson (centre) presents eskimo carvings to Governor James B. Edwards (left) of South Carolina and Governor Ray Blanton of Tennessee. Mr. Jamieson who was in Atlanta, Georgia, re-

cently to address the Southern Council on International and Public Affairs (see Canada Weekly dated May 18), also met privately with a group of prominent Atlantans as well as the two governors.



### Barbara Ann Scott today

Barbara Ann Scott, Canada's darling of the Forties, created a sensation which brought Canada into the international figure-skating scene as never before. Today even those too young to have seen her skate recognize her name as a legend.

Today, she lives a rather different life in the United States, as the wife of a prominent Chicago business man.

"B.A.", as she is affectionately known, says her "main interest" now is Thomas V. King. He is general manager of two of Chicago's largest wholesale department stores, the 25-storey Merchandise Mart, and the Apparel Center, both owned by the Kennedy family. Barbara Ann spends much of her time in social engagements connected with Tom's business.

When business obligations permit, Barbara Ann pursues the other love of her life — horses. The little girl who used to write Santa Claus for skates and horses may have hung up her skates, but the devotion to horses endures.

Showing American saddlebreds is a full-time hobby that B.A. and Tom enjoy together. Barbara prides herself in the grooming and tender care she gives to their present seven-year-old grey mare, King's Regal Lady.

Although B.A. does no figure skating now, and has no direct involvement with it, she always has an objective interest. But she feels figure skating today "has changed so much! For example, when I skated we did six figures on each foot! Today they do only three! Barbara Ann Scott's career in profes-

Barbara Ann Scott, figure-skater, was:  
 Junior Canadian Champion, 1940 (age 11)  
 Senior Canadian Champion, 1944, 1945, 1946, 1948  
 North American Champion, 1945, 1947  
 European Champion, 1947, 1948  
 World Champion, 1947, 1948  
 Olympic Champion, 1948

sional show business began in 1948, after her four spectacular championship performances that year. Following an ice show which opened in New York in December 1948, a pro tour of Canada in 1950, and many other appearances in North America and overseas, she joined the Hollywood Ice Revue. Here she replaced Sonja Henie, former world figure-skating champion and movie star whom Barbara Ann, as a girl, adored. As a result of her financial success, an organization called the St. Lawrence Foundation was established to help her share part of her earnings with crippled children in Canada. In 1950, B.A.'s autobiographical book, *Skate With Me*, was published by the St. Lawrence Foundation.

After skating five years with the Revue, and turning down other offers, including a movie contract with MGM, B.A. finally made the move to step away from her professional career. Always a perfectionist in her art more than a seeker of fame, B.A. admits she never really enjoyed the hard, coldness of show business, and looked forward to settling down to domestic life. In 1955, she married the then-publicity director for the Revue and became Mrs. Thomas V. King. (From *Canadian Skater*, March-April-May issue.)

### PM and Margaret separate

The Prime Minister's office issued the following announcement on May 27:

Pierre and Margaret Trudeau announce that, because of Margaret's wishes they shall begin living separate and apart.

Margaret relinquishes all privileges as the wife of the Prime Minister and wishes to leave the marriage and pursue an independent career.

Pierre will have custody of their three sons, giving Margaret generous access to them.

Pierre accepts Margaret's decision with regret and both pray that their separation will lead to a better relationship between themselves.

### Opening up more jobs to women

Labour Minister John Munro and Manpower and Immigration Minister Bud Cullen recently made a joint announcement of the first phase of an "Affirmative Action Program" designed to improve and enhance the employability of women in Canada. "Affirmative Action" involves a series of positive steps undertaken by employers to remove barriers to employment and to achieve measurable improvements in hiring, training and promoting qualified workers who have in the past been denied access to certain jobs.

In elaborating on this program, Mr. Munro stated that "it originated in December 1975 during a federal-provincial conference on human rights, and was conceived in close collaboration with provincial and human rights agencies in order to secure co-operation among companies awarded federal contracts." "There are more than 1,000 such contractors across Canada," he added, "and they will be provided with Affirmative Action Program guidelines and necessary consultative services."

The program guidelines, a joint effort of Manpower and Immigration and Labour Canada, detail such points as: making preliminary analysis of the present situation in a company to determine if there is a need for affirmative action; how to organize such a program; how to monitor the program and get "feedback"; and how to use if necessary, available internal and external resources.

# News of the arts

## Second European tour by NAC Orchestra

The National Arts Centre Orchestra founded in 1969, will begin its second European tour, which will last about a month, in April 1978, with concerts in both Germany and Italy.

Under the direction of conductor Mario Bernardi, the orchestra will give 12 concerts in Germany, including performances at such major centres as Berlin, Bonn, Frankfurt and Stuttgart. Eight concerts will be given in Italy, three of them in Sicily.

The tour will be under the auspices of the Department of External Affairs and will be co-ordinated by the Touring Office of the Canada Council and David Haber Artists Management Inc.

Two of Canada's leading musicians (both of whom have performed with the ensemble on many occasions) will be soloists with the orchestra — pianist Anton Kuerti and violinist Steven Staryk.

At least three Canadian works will be performed during the tour. Two will

be newly-commissioned compositions by Harry Somers and R. Murray Schafer and the third will be the *Third Symphony* by Jacques Hétu, which the orchestra has performed with great success both in Ottawa and elsewhere.

## Jubilee gold coin

A Toronto artist's design will appear on the reverse of the \$100 gold coin that will be struck to commemorate the twenty-fifth anniversary of the accession to the Throne of Queen Elizabeth II. Raymond Lee's submission depicts the official flowers of Canada's provinces and territories; he describes it as "characteristically Canadian, reflecting the beauty and graciousness of the Queen." The selection of this design from 56 submissions was announced by Supply and Services Minister Jean-Pierre Goyer, who reports to Parliament for the Royal Canadian Mint.

The obverse of the 22-karat coin, containing half an ounce of gold, will bear Machin's effigy of the Queen and

the inscription "Silver Jubilee — Elizabeth II 1952-1977 — 25 ans de règne." The coin, 27 mm in diameter, will be issued in September.

Mr. Goyer said 26 Canadian artists had been invited last month to submit designs. A selection committee of artists and numismatists screened the submissions and then passed on recommendations to the Mint Board of Directors, who made the final choice.

## Book about whales

A group of distinguished Canadian poets and artists have collaborated on a book about whales, the profits of which will be donated to the Greenpeace Foundation.

The work, published by Dreadnaught Press, includes original art from Harold Town, William Kurelek, Ken Danby, Walter Redinger and others, as well as poems by Margaret Atwood, Irving Layton, Susan Musgrave, Tom Wayman and more. The book makes a strong artistic statement about the need to prevent the extinction of the whale.

## Money for Post-sponsored projects

Canada will spend \$16 million on small projects administered by Canadian embassies in developing countries in 1977-78. The Mission Administered Fund (MAF) enables embassies to respond quickly to local requests for assistance. The funds, from CIDA's regular bilateral grant allocations, are limited to a maximum of \$25,000 a project, and are usually given to such organizations as community or agricultural co-operatives, village development committees, hospitals, schools, and recognized non-governmental organizations working in the country.

The committees generally use the funds to meet very basic needs. In a small village in the Sico valley on the north coast of Honduras, the inhabitants found themselves isolated from the regional centre at Limón by inadequate transportation. The 4,000 people in the area lacked schools, hospitals and means to take produce to market. Yet the potential for better communications existed: a railway left unattended and in disrepair after the United Fruit

Company left the area years before. What was needed was the means to convert it to a road.

One of the haciendas in the area used caterpillar tractors to work the land, but after Hurricane "Fifi" in 1975 the tractors were buried in silt. The owner offered to donate one of them to the local people for repair of the railway bed on the condition that they find the means to recover it, repair it and provide fuel for it. The townspeople applied to the Canadian Embassy for the funds and received about \$4,200. The people did the work themselves, and they now have a road that gives access to the market in Limón. The improved communications have prompted the Government to provide a school, a small clinic and an agricultural adviser who is helping the farmers improve crop yields. In another part of Honduras, 20 agricultural co-operatives received about \$16,000 to install hand pumps in small villages where there was a serious need of drinking water.

In Costa Rica, the mission supplied \$5,000 for the purchase of outboard motors for small boats used by the

## Governor General attends Jubilee events in London

Governor-General and Mrs. Léger left Ottawa for London on June 5 for a five-day visit to attend special ceremonies to mark the Queen's Silver Jubilee.

Their schedule included a thanksgiving service at St. Paul's Cathedral on June 7, followed by a luncheon given in the Queen's honour by the Lord Mayor of London at the Guildhall.

Mr. and Mrs. Léger planned to view other Jubilee events taking place during the week, including an illuminated pageant and fireworks display on the River Thames, and to attend a lunch given in their honour by Canadian High Commissioner Paul Martin and Mrs. Martin on June 9.

Ministry of Health to service parts of the country accessible only by water.

The lengthy list of MAF projects affects 84 countries in the developing world.

## Commercial Products

(Continued from P. 2)

ciency and bulk sales, the same quantity is sold profitably for 5 cents.

### Molybdenum sales

Commercial Products began selling molybdenum-99 in 1974. This isotope has replaced many of the isotopes previously used in nuclear medicine, and CP is now the world's largest producer, making an important contribution to medical diagnostic techniques. Shipments of bulk isotopes from CP have increased dramatically since 1973, with revenue growing sixfold in four years despite increasing competition from world-wide organizations.

In 1966, CP built a mobile laboratory that included an antimony neutron source. In 1970, a revolutionary new low-power nuclear reactor, called "Slowpoke", was installed at Tunney's Pasture. This reactor resulted from joint CRNL-CP co-operation. The first commercial unit was installed in June 1971 at the University of Toronto. Five such reactors have been installed in Canada, and there is active interest in several more on the part of other countries.

Since the early days, there had been equal emphasis on research and on the sale of products. Examples of these research projects are irradiated wood impregnated with monomers; the Maple power sources, which are still in use at Brockville for a navigational aid, and the weather station at Resolute Bay; radiation-resistant lubricants; and X-ray fluorescence. In 1973 there was a change from the functional organization to a product-oriented organization and the research missions at CP were dropped in favour of a strictly commercial approach. Today the three product groups — medical, industrial and isotope — have their own development,

production and marketing staffs and are supported by the administration and finance divisions.

In 1964, with business booming (a record year, with a profit of nearly \$900,000, and some 300,000 patients a year being treated on AECL cancer therapy units), the manufacturing group moved to its present location at South March, near Ottawa. The administration, finance and marketing groups followed in 1968, and in 1972 the new cobalt-60 building was occupied. The cobalt-60 cells in this building were required to accommodate the millions of *curies* becoming available from the Pickering power reactors and the growing industrial market for gamma-sterilization equipment. Plans had been made to move all CP facilities to South March, but the isotope group remains in the old building at Tunney's Pasture, making an increasingly significant contribution to CP's profits with the production of molybdenum-99, carbon-14, iodine-125 and -131, and the other isotope-related products and services.

In 1963, the efforts of Roy Errington, the founder of the division, were recog-

nized when he was made the vice-president of Commercial Products. He retired in 1974 and his place was taken by Archie Aikin, who had served at the Whiteshell Nuclear Research Establishment and at Chalk River. When Dr. Aikin moved to head office about six months later, John Beddoes, a newcomer to AECL, became the third vice-president in charge of Commercial Products.

Mr. Beddoes has stated the role and objectives of Commercial Products as "a business enterprise supplying both domestic and worldwide markets with products and services based on the application of nuclear-energy technology to radioisotopes, radiation equipment and related product areas...."

The move towards accelerator production and the necessity to absorb new technology has required a major effort on the part of CP, though throughout its history there have only been six years that did not show a profit. Commercial Products ends fiscal year 1976-77 with sales revenues in excess of \$20 million, unfilled orders of nearly \$30 million and a staff of about 600.

## News briefs

■ The population of Canada at June 1, 1976 was 22,992,604, an increase of 6.6 per cent or 1,424,693 from that of the previous census in 1971. Alberta and British Columbia recorded the largest growth rates at 12.9 per cent each. Ontario's growth was next in line at 7.3 per cent. The Calgary census metropolitan area showed the greatest increase at 16.5 per cent with Kitchener census metropolitan area following at 14.1 per cent. The Toronto census metropolitan area became the largest in Canada, with a population of 2,803,101, some 7.7 per cent more than in 1971, while Montreal CMA was very close behind at 2,802,485, showing a growth of 2.7 per cent since 1971.

■ Ontario Premier Davis, who had promised to keep the national unity issue out of the Ontario provincial election campaign, says he wants to remain premier so he can tell Quebecers as leader of a powerful province that they should vote against separation. The election takes place on June 9.

■ The Federal Government proposes to spend up to \$125 million over the next three years to help improve transportation services in the four Atlantic provinces. The proposed three-part program, which will be subject to formal agreement with the provincial governments concerned, is designed to upgrade the primary highway network, to improve passenger transportation, and to rationalize freight and passenger subsidy payments within New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland.

■ The Institute for International Co-operation of the University of Ottawa is holding a study session on socio-cultural development in Benin from July 1-31. Courses will be given in French at Benin's national university.

■ Canada has agreed to contribute \$447.9 million over the next three years to the International Development Association (IDA), a World Bank affiliate.

■ Quebec is getting the largest single grant from the \$70 million in extra federal job-making funds announced in the May budget for a total allocation of \$36,173,000 in the Canada Works program.

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