

Bulletin

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CANADA'S ATOMIC ENERGY

The following excerpts are from the 1968-1969 annual report of the Atomic Energy of Canada Limited, which was published last month:

...In broad terms, AECL is responsible for research into and development of peaceful uses of nuclear energy, as a contribution to the general welfare and in the interest of scientific and technological progress in Canada.

More specifically, AECL has as its principal objective the development of nuclear power systems that will meet near- and long-term Canadian needs for low-cost energy and will be commercially attractive to other countries.

A second, major objective is to improve and extend the uses of radioisotopes and nuclear radiation, in the diagnosis and treatment of disease and in industrial and other applications....

The company's main research and development centers are the Chalk River Nuclear Laboratories, Ontario, and the Whiteshell Nuclear Research establishment, Pinawa, Manitoba. Additional research and development work is carried out, on a contract basis, by private industry and universities.

The Power Projects group, with a design office and development laboratory at Sheridan Park, Ontario, and a design office at Peterborough, is responsible for nuclear power system design, nuclear engineering consulting services, development and testing of major equipment items for nuclear power stations and project management as required.

The Peterborough office of Power Projects comprises the former nuclear power system engineering group of Canadian General Electric Company Limited. At the suggestion of CGE, AECL assumed responsibility for the direction and support of the CGE nuclear

CONTENTS

Canada's Atomic Energy	1
Scientific Equipment for India	2
Monument to Avalon Colony	2
Canada to Study Moon Samples	3
W. Indies University Expansion	3
Diplomatic Appointments	4
Postal Coding System	4
Loan to Filipino Phone Firm	4
Cigarette Smoking Down	4
Hazardous Products Act	5
UIC Payments to Banks	5
The Need for More Exports	5
Summer Student Job Survey	6

engineering group effective July 1, 1968. The merger agreement is for five years, with appropriate cancellation arrangements.

The Commercial Products group, with offices and manufacturing plant at South March, Ontario, and a laboratory in Ottawa, processes and markets radioisotopes, designs, manufactures and sells related equipment, and directs a research program in the application of radiation and radioisotopes.

CANDU

The Canadian nuclear power system is named CANDU, from its use of heavy water (deuterium oxide) as the reactor moderator and natural uranium as the fuel. Its essential and outstanding feature is its economical use of neutrons, the nuclear particles that play an essential part in the fission process. Neutron economy is based on and achieved through the use of the most efficient moderating material, heavy water, and by the design of a system and choice of reactor materials that are consistent with the neutron conservation principle. As a result, CANDU reactors have the advantage of being able to burn natural uranium fuel, and to do so efficiently.

The ultimate benefit from neutron economy is that the uranium consumption and fuelling costs of

CANDU reactors are less than half those of other established nuclear power systems and will be kept low by taking advantage of the flexibility of fuelling methods to meet changing prices of nuclear fuel. So efficient is the fuel cycle that there is no need to finance an inventory of spent fuel from a CANDU reactor. However, since it contains a sizable proportion of plutonium, the spent fuel may be regarded as an asset which can be "banked" until such time as it is profitable to sell it or to extract the plutonium for re-cycling in Canadian power reactors.

HIGHLIGHTS OF THE YEAR

- The Government of Ontario approved plans by Ontario Hydro to build a 3-million kilowatt nuclear power station at Douglas Point. To be known as Bruce Generating Station, the plant will have four 750-megawatt CANDU reactors, with the first scheduled to come into service in 1976 and the others following at yearly intervals. AECL has been commissioned to be the nuclear engineer for the project.
- AECL was authorized to build at Douglas Point a heavy water production plant with a capacity of 800 tons a year. Site work has started and completion is scheduled for 1972-73.
- Effective July 1, 1968, the nuclear power design and engineering group of the Canadian General Electric Company Limited was merged with that of AECL Power Projects, under the terms of an agreement between the two companies.
- AECL's responsibilities were extended to include the export marketing of Canadian nuclear power stations. Contacts were established with a number of countries that have announced they intend to "go nuclear" and have expressed interest in the CANDU system.
- The Nuclear Power Demonstration station was converted from pressurized heavy water to boiling heavy water coolant and was declared "in-service" as a BHW reactor on January 2, 1969. Despite a new mode and new equipment, the station achieved a remarkable capacity factor of 86.8 per cent in the next three months.
- AECL and the Commissariat à l'Énergie Atomique of France concluded an agreement extending co-operation between them to include proprietary information relating to heavy water reactors cooled by water.
- A contract was signed for the sale by AECL to the French Commissariat à l'Énergie Atomique of plutonium, worth some \$1 million. The plutonium will be extracted from spent fuel from Canadian nuclear power stations.
- "Packages" of technical information relating to the Canadian nuclear power system were sold to the Japanese Power Reactor and Nuclear Fuel Development Corporation for use in developing an advanced thermal-nuclear reactor in Japan.
- Irradiation testing was completed in the NRU reactor of a full-scale prototype booster rod for the Gentilly nuclear power station. Maximum power

delivered during the test was 5.5 megawatts, making it the highest power fuel experiment ever carried out at CRNL.

- Sales by Commercial Products of Eldorado and Theratron teletherapy units increased substantially, resulting in the highest number of units sold in any year to date.

SCIENTIFIC EQUIPMENT FOR INDIA

India is to receive a grant of \$100,000 from Canada for the purchase of scientific and technical equipment for use in various research programs of the Indian Council of Scientific and Industrial Research (CSIR).

The aid will take the form of a \$100,000-worth of credit to be established by the Canadian International Development Agency with the National Research Council of Canada, which will enable the NRC to procure Canadian scientific equipment for its Indian counterpart organization.

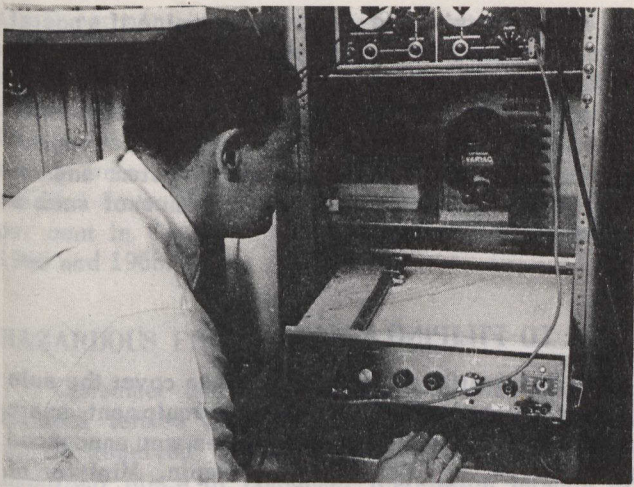
The future growth of India's large industrial sector depends greatly on the research being carried out by the CSIR for the provision of new inventions and technological advances. The Council also undertakes considerable research work on medical, agricultural and related programs through its many sub-stations. Until now, lack of adequate equipment has been a limiting factor in its work.

MONUMENT TO AVALON COLONY

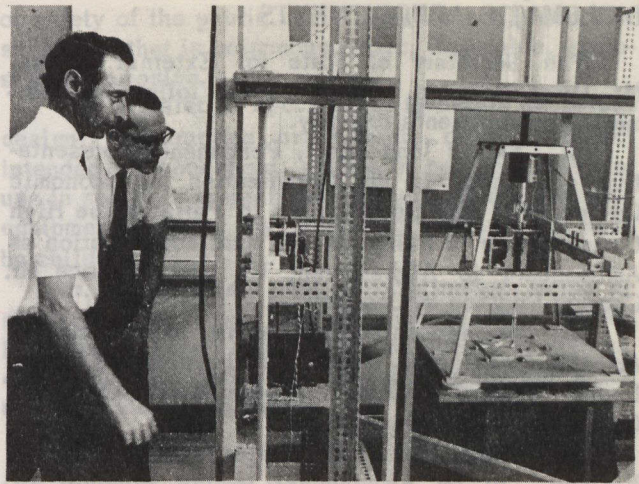
A federal monument commemorating the seventeenth century English colony of Avalon in Newfoundland was unveiled on July 12 at Ferryland, a community of about 800, half-way down the east coast of the Avalon Peninsula, about 50 miles south of St. John's, the provincial capital.

The little fishing colony was founded in 1621 by Sir George Calvert, later Lord Baltimore. In the conviction that he was strengthening Christianity in America, Baltimore called the colony Avalon, the ancient name for Glastonbury, according to legend the place where Christ's message was first preached in Britain. The Avalon Peninsula was one of the earliest refuges for Englishmen fleeing religious persecution; several settlements of Puritans had been established before Calvert's arrival.

The monument, contemporary in design and symbolizing Baltimore's "mansion house" of stone and timber, stands near the site of the original structure. Two bronze plaques, one in French and one in English, are fastened to a backing of three white oak timbers upheld by a concrete and stone support at each end. Commissioned by the National Historic Sites Services of the Department of Indian Affairs and Northern Development, the monument will replace a temporary plaque erected on the outside wall of St. Joseph's Central High School two years ago.



The Curie balance, with which Canadian scientists will measure the magnetization of moon sample.



Moon sample's remanent magnetism will be measured with the astatic magnetometer.

CANADA TO STUDY MOON SAMPLES

The Geological Survey of Canada will take part in the research following mankind's first visit to the moon. In response to the submission of a proposal to the United States National Aeronautics and Space Administration, the Geological Survey of Canada has been chosen to carry out detailed scientific investigations on samples of lunar material brought back by *Apollo XI* astronauts.

The proposal to carry out these studies was submitted in 1966 at the invitation of NASA by the Department of Energy, Mines and Resources and was based on the storehouse of expert knowledge amassed by the GSC since its formation in 1842. With over a century and a quarter of experience in examining

earthly materials and the up-to-date techniques and modern equipment in use by the GSC, the proposed studies of the lunar rocks, detailed and complex as they will be, involve a minimum of special preparation.

Studies of the moon samples will be in the fields of mineralogy and petrology; magnetism; electrical conductivity; elemental concentrations and isotopic abundance ratios and chemical analysis.

To make the studies, the GSC scientists hope to receive lunar samples in the form of polished thin sections, powder, a one-centimeter cube and a small cylindrical core sealed in a glass tube - in all about two ounces of the moon's surface.

W. INDIES UNIVERSITY EXPANSION

Work has begun on a \$2,131,000-expansion program for the University of the West Indies through the co-operation of the Canadian International Development Agency. The program includes construction of six university centers in the Windward and Leeward Islands, a student residence in Barbados and a faculty club in Trinidad. It is part of a five-year \$5-million plan of Canadian assistance to the University begun in 1966, which includes the construction of building, the provision of scholarships and fellowships for training in Canada and at UWI, and the provision of Canadian lecturers and professors.

In 1968-69, Canada provided scholarships for 93 students at UWI; 21 postgraduate students were brought to Canada for study and 18 Canadian professors served at the University.

In 20 years, UWI has expanded from one college center at Kingston, Jamaica, with a total enrolment of 33 students in 1948, to two more in Trinidad and Barbados, providing education for 3,614 students in 1968. The six centers now under construction on the islands of Dominica, Grenada, Montserrat, St. Kitts, St. Lucia and St. Vincent will make a university education accessible to more West Indians than ever before.

DIPLOMATIC APPOINTMENTS

The Secretary of State for External Affairs, Mr. Mitchell Sharp, announced the following diplomatic appointments recently.

Mr. Charles John Small, Permanent Representative of Canada to the Organization for Economic Co-operation and Development in Paris, to be High Commissioner to Pakistan with dual accreditation as Ambassador to Afghanistan. He will replace Mr. Charles Eustace McGaughey.

Mr. Charles Eustace McGaughey to be Canadian Ambassador to Israel, where he will replace Mr. Robert Louis Rogers, recently appointed Deputy High Commissioner in London.

Mr. Harry Havilland Carter, Ambassador to Finland, to be Ambassador to the Republic of South Africa with dual accreditation as High Commissioner to Botswana, Lesotho and Swaziland. He will replace Mr. C. J. Woodsworth.

Mr. Charles James Woodworth to be Ambassador to Ethiopia, where he will replace Mr. Michel Gauvin.

Mr. Michel Gauvin to be Ambassador to Portugal, replacing Mr. Jean Morin, who is retiring from the Public Service.

Mr. J. M. Cook, head of the Personnel Operations Division, Department of External Affairs, to be High Commissioner to Kenya, with dual accreditation to Uganda. Mr. Cook will replace Miss Margaret Meagher, who has been appointed Ambassador to Sweden.

POSTAL CODING SYSTEM

Communications Minister Eric Kierans has announced that a management consultant firm will design a permanent public-address postal coding system for the Canada Post Office.

A report, which will include the design and plan of a national postal code, is scheduled to be completed by early November, and after study and approval, Mr. Kierans explained, a national postal code will be implemented as soon as possible. No new postal zones will be named in Canada until the new code is in effect.

TERMS OF REFERENCE

The study will evaluate the needs of the operating service for a postal coding system; design a system that will enable the Department to take full advantage of mechanized and automated sorting machines; assist the manual mail processing systems; ensure the best use by both the Post Office Department and the public, especially large-volume mailers, and have the flexibility to accommodate shifts in population.

The report will also evaluate whether the postal coding system would satisfy the numbering requirements of the Department's management information system; examine the feasibility of the present three-character postal zoning systems being continued as

part of the postal coding system; determine if a postal coding system should identify sections or units within a city sortation system, which would allow an automated sort directly to the letter-carrier walk; recommend a detailed plan for the introduction and implementation of the postal coding system and recommend guide-lines for the maintenance of such a system.

LOAN TO FILIPINO PHONE FIRM

A \$14.6-million loan agreement to cover the sale of telephone and telecommunications equipment, spare parts, and services to the Philippines was announced on July 23 by Mr. Jean-Luc Pepin, Minister of Industry, Trade and Commerce. The loan will be made by the Export Credits Insurance Corporation pursuant to a commercial agreement between the Philippines Long Distance Telephone Company, Manila, and Automatic Electric (Canada) Limited, Brckville. The loan is for a term of 12 years, including a two-year grace period.

This is the third ECIC loan to the Philippine company. The first two, totalling \$24.5 million, were made in 1964 and 1966. All are part of a phased modernization and expansion of the telephone system in the Philippines.

The transaction will probably produce about two million man-hours of employment for Canada.

With this loan, the total amount of contracts signed under ECIC's long-term export financing program is \$448 million.

CIGARETTE SMOKING DOWN

Health Minister John Munro reported on July 15 that the *per capita* consumption by Canadians over 15 years old of manufactured and hand-rolled cigarettes had decreased 5 per cent from 3,961 in 1966 to 3,755 in 1968.

Mr. Munro pointed out that published figures frequently showed only the total production or sales without relation to changes in population. Their downward trends since 1966 are more significant therefore, than figures for total sales. Figures for each person 15 years of age and over are considered to be the most realistic, since that is the age group of the majority of smokers.

"We hope the downward trends will continue and ultimately be reflected in decreases in premature deaths from heart attacks, lung cancer and chronic bronchitis and emphysema," Mr. Munro said. "Already, however, there are many persons who are enjoying life more since they have cut down or cut out cigarettes."

Mr. Munro attributed much of the drop in consumption to the discontinuation of cigarette-smoking by men, who tend to be heavier smokers than women. Surveys of Canadian smoking habits carried out for

his Department by the Dominion Bureau of Statistics show that the proportion of regular cigarette-smokers among men 15 years of age and over decreased from 54.6 per cent in September 1965 to 51.7 per cent in October 1968. The proportion of regular smokers among women 15 years of age and over, which increased from 30.6 per cent in August 1964 to 32.5 per cent in October 1968, changed slightly between 1966 and 1968.

HAZARDOUS PRODUCTS ACT

Consumer and Corporate Affairs Minister Ron Basford termed the new Hazardous Products Act, which received royal assent recently, the most important piece of consumer legislation passed by Parliament in recent years. "For the first time, it gives the Government the power to prohibit or regulate the sale of a wide-range of hazardous products," he declared. "Consumer groups and safety leagues have been demanding such legislation for years. It is a model for other countries and has already come under study by a commission concerned with hazardous products in the United States."

With royal assent, the new law immediately makes it illegal to import, advertise or sell:

Furniture, toys and other articles intended for children which are coated with paints containing harmful amounts of lead. This is intended to reduce the incidence of infant poisoning caused by sucking painted surfaces.

Varnishes and paints which are highly inflammable. (This will remove from the market paints with dangerously low flashpoints.)

Jequirity beans, and any toys or jewellery made with the highly poisonous beans. (Used occasionally as dolls' eyes or for necklaces, these small beans are characterized by a shiny red surface marked by a black dot. It has not been possible to outlaw their importation or sale until now.)

Other highly hazardous products can be outlawed as soon as they are identified.

LABELLING AND PACKAGING

In addition, the manner of selling, advertising, labelling and packaging certain hazardous products can be regulated.

The Department of Consumer and Corporate Affairs already contemplates regulation of various household bleaches, cleansers and polishes that are responsible for a large number of child poisonings a year. Regulations can include such things as the safe packaging of products, clear labelling as to proper use, printing of antidote information and, when they are developed, child-proof closures.

Also planned is regulation of hobbycraft glue so that certain harmful solvents will not find their way easily into the hands of those likely to abuse their use.

The scope of the Act extends to a very wide range of products likely to be of danger to the health

or safety of the public. This includes any product or substance that is poisonous, toxic, flammable, explosive or corrosive.

The legislation specifically mentions dangerous design, construction or contents of any product intended for household, garden or personal use, for use in sports or recreational activities, as life-saving equipment, or as a toy, plaything or equipment used by children.

Mr. Basford said that early attention would be given to dangerously flammable fabrics, sub-standard life preservers, defective matches, dangerous children's toys and other household products which are hazardous to consumers.

UIC PAYMENTS TO BANKS

Nearly 200,000 of the 450,000 employers registered with the Unemployment Insurance Commission of Canada will soon pay their monthly contributions directly to chartered banks and certain other financial institutions.

The purpose of this new procedure, effective October 1, is to make it easier for employers using the bulk-payment method to make their payments. Negotiations with the various institutions that began in January, are continuing.

New remittance forms will be sent in September to all employers using the bulk-payment method.

There is no charge to the employer for this new service and no pay exchange if he is obliged to send the remittance to another city.

Under the new arrangement, the employer sends the money to his own financial institution, either by cheque or cash, or he arranges to have his account automatically debited when he sends in the remittance form. The money then goes to the agency of the Bank of Canada where it is deposited to the credit of the UIC.

If the employer's present banking facilities do not come under the new agreement, he can deal with any chartered bank, which will probably want a certified cheque, cash or a money order.

Some institutions such as those with no commercial accounts, and some of the larger trust companies have decided not to take part in this scheme - usually because they have little or no floating funds to cover the period when the money is in transition from their funds to the Bank of Canada.

THE NEED FOR MORE EXPORTS

Mr. Jean-Luc Pepin has called for intensified efforts by exporters to maintain the export-growth momentum necessary for a strong external financial position and a healthy economy.

The Minister was commenting on export figures issued by the Dominion Bureau of Statistics, which show that Canada's exports reached \$7,281 million in the first half of 1969, nearly 12 percent above

the level of the same period of 1968. Exports in June were up 15 per cent from those of June last year, indicating the maintenance of a strong rate of advance to mid-year.

Exports to the United States increased by \$754 million, or 17 per cent, in the six-month period and accounted for virtually all the increase in the export total. With some easing of demand pressures now in prospect in the U.S., the unusually large export gains realized in that market during recent years will be difficult to sustain.

Meanwhile, rising income levels and strong demand conditions in Canada have given new impetus to the upward trend of imports which, so far this year, have increased considerably more than exports.

In these changing circumstances, the Minister indicated, it was increasingly important to give the fullest attention to the development of new market opportunities and to the maintenance of international competitiveness.

The Minister drew attention to the expanded financing and insurance facilities provided for in the Export Development Act recently passed by Parliament, and urged producers to take full advantage of the new facilities and other services available from the Department of Industry, Trade and Commerce to encourage industrial expansion and export development.

SUMMER STUDENT JOB SURVEY

Some 18,000 students from 38 universities and community colleges across Canada will be questioned about their summer employment and job-seeking experiences, according to a recent statement made by Mr. Allan J. MacEachen, Minister of Manpower and Immigration. In announcing a survey to be conducted by his Department in the autumn, Mr. MacEachen pointed out that it would represent between 4 and 5 per cent of the total post-secondary student population in Canada, and would indicate the pattern of summer employment in all regions of the country.

The increase in the number of students in recent years has made it difficult for the labor market to absorb the annual inflow of summer job-seekers. This is a matter of concern to federal, provincial and municipal governments, industry, students, the universities and other agencies.

Earlier this year, the Department launched a program to generate more employment for summer students. The steps taken included an extensive national publicity campaign, expanded co-operation with local student employment committees, and a 10 per cent increase in the number of students hired by Federal Government. Staffs of Canada Manpower Centers have been working in close co-operation with all segments of the private sector. The program was launched after consultation with provincial and educational authorities, the Association of Universities, the Association of Universities and Colleges of Canada and the University Career Planning Association. In addition, the staff of the Economic Council of Canada made important conceptual contributions with respect of certain aspects of the program.

PURPOSE OF STUDY

Facts are required to evaluate these efforts and to shed light on the general question of student job needs. Little up-to-date information exists on the summer employment experience among students, the most successful methods and times of seeking summer jobs, the average length of summer employment, and other facts that would help in planning next year's program.

Students will be queried on their attempts to find summer jobs. They will be asked, among other things what type of job they had and for how long; whether they would have preferred to work longer; whether they be interested in obtaining permanent work with the employer with whom they worked; and whether employment had been offered and refused and why.

"We already have assurance of full co-operation from many of the larger universities, especially those that have summer employment committees," Mr. MacEachen said. I am sure that we will get the same reaction from individual students."