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Report outlines five-year plan for Canadian space program

Canada's interest in and use of space systems have grown slowly but assuredly over the past two decades and for reasons of geography and demography are expected to continue to develop in the foreseeable future, according to a Federal Government discussion paper outlining proposals for Canada's space program for the next five years. Excerpts from the report, The Canadian Space Program; Five-Year Plan (80/81-84/85) follow:

Because of the high economic and social dividends which can result from the effective and rational use of space technology, the high cost of satellite systems and the need to keep abreast of a rapidly-developing technological field, it is important that a country like Canada ensure that its limited resources are utilized in an effective and opportune manner, that duplication of effort is avoided, that a technology base is developed continually to meet future needs, and that all activities in space are blended into a coherent program able to assist in meeting many national goals. This is particularly true in respect of government programs which must meet a wide variety of requirements with effectiveness and parsimony.

In order to meet its requirements for space systems, Canada could follow a number of approaches, ranging from complete foreign dependency to complete self-sufficiency. The former was rejected at the outset of the Canadian space program beginning with the construction in Canada of the first *Alouette* satellite and its successors, followed in 1963 by the Government's declared objective of developing technology in Canadian industry; then, in 1970, the decision to build the Communications Technology Satellite (CTS) with the objective of further developing the industry as well as meeting future Canadian requirements; then, in 1975, the decision to establish a prime-contractorship in Canada for Canadian spacecraft. At the same time, it was recognized that Canada could not afford the development of a launching capability — which could cost several hundred million dollars per annum for many years to come — and would have to rely on

launching services of other countries. To date, Canada has utilized the services of the U.S. National Aeronautics and Space Administration (NASA) under conditions which can be considered reasonable. In order to increase [its] ability to obtain foreign launchers for [its] future satellite systems, Canada has sought participation in the national programs of supplier nations. Thus, the National Research Council (NRC) decided upon the design and construction of the Remote Manipulator System as Canada's contribution to the Space Shuttle program of the U.S. At the same time, Canada has developed co-operative links with the European Space Agency, whose *Ariane* launcher could, in the early Eighties, prove to be a viable alternative.

* * * *

New Project Proposals

Several government departments have developed proposals in certain key areas of space activity which are intended to maintain and enhance the nation's access to the benefits of space technology. While, in the past several years, significant strides have been made in the area of satellite communications, in which the pace should be maintained, there are other areas, particularly in remote sensing, where to date Canada has had to rely on its southern neighbour for data about Canada gathered by U.S. satellites. In order not to be totally dependent on the goodwill of the U.S. for such data, it is being proposed that Canada put herself in the position of becoming an essential contributor to a proposed European remote sensing program, and also eventually contribute to the planning and implementation of similar U.S. and inter-

Two-hundred-and-fifteen years ago today...
St. Patrick's Day was celebrated for the first time in Canada, at Quebec City.

national programs. This will guarantee to Canada, in the long-term, continued access to the data obtained by these systems and their successors and generate within Canadian industry an activity commensurate with [its] contribution to their costs. For a resource-based and trading nation like Canada, the value of such data cannot be overemphasized, particularly in view of the fact that other nations — many of them our competitors in world markets — will have such data to use to advantage.

The total number of new projects is 15. These can be categorized as research- and development-intensive, which includes the majority of the proposals, and operations-oriented. A secondary breakdown into activity areas produces the following classification:

Research and Development

Remote Sensing

- Technical studies prerequisite to a Canadian radar development program.
- A Canadian radar development program (two projects subject to the above prerequisite).
- A joint Canada/U.S.A. meteorological satellite research program.

Space Science

- A joint NRCC/NASA Space Science Program.

Communications

- Engineering definition studies prerequisite to a *MUSAT*, multipurpose satellite system (two projects).
- Planning studies for a direct satellite broadcasting system (DBS).
- Extension of the *ANIK-B* experimental program.

Industry Support

- An increase of DOC's technology development program.
- Industry support in its bid for the *NATO-IV* satellite contract.
- Support of new international initiatives.

Operational

Remote Sensing

- Arrangements for receiving data from *LANDSAT-D* satellites.

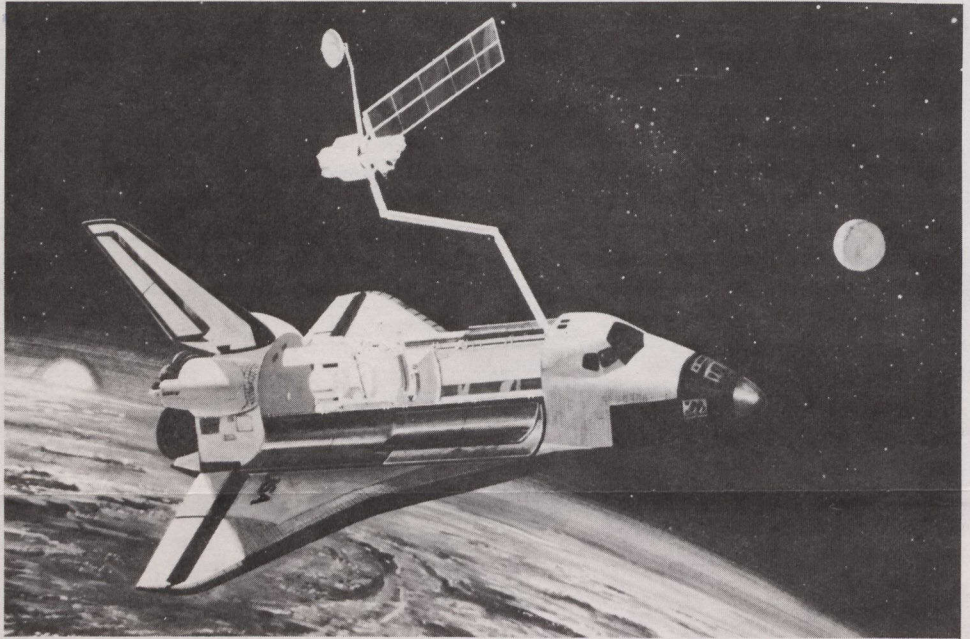
Communications

- The construction of the *MUSAT* system (subject to the results of the engineering definition study).

Project highlights

LANDSAT-D (EMR)

The *LANDSAT-D* satellite is scheduled to be launched by NASA in 1981, to replace



The remote manipulator system is the arm attached to the U.S. Space Shuttle.

LANDSATs 2 and 3 now in orbit. *LANDSAT-2* may cease to function anytime and *LANDSAT-3* is expected to last at least until 1981. Through the use of a new thematic mapper covering a much broader spectrum of measurements, this satellite will provide better colour discrimination and spatial resolution...and, consequently, greater detail and an improved identification capability over the present satellites. The total cost to Canada for this program is estimated at about \$13 million (1979 dollars) over the period 1980-83 including charges of \$250,000 (U.S.) to read out the *LANDSAT* satellites with the Canadian ground stations....

Satellite Radar Development Program

While Canada is a user of remote sensing satellites and has developed a capability in receiving, processing and utilizing data which has received world-wide recognition, it has not contributed to the actual design and construction of the satellites themselves.... The European Space Agency, following a planning phase in which Canada has participated to the extent of having responded to the Agency's request for comment and criticism, has now embarked upon a "Preparatory European Remote Sensing Satellite Program". Participation in this program could be of significant benefit to Canada in acquiring the technological expertise needed to build in Canada the Synthetic Aperture Radar package.... Since the European program is already underway, the option for Canadian participation should be ex-

ercised as soon as possible. The cost of such participation would be \$1.7 million over the fiscal years 1979-1980 to 1981-1982....

Multipurpose Satellite - *MUSAT* (DOC)

The Department of Communications has aggregated the needs of federal and provincial departments for press-to-talk voice communications with ships, aircraft and field parties in the Canadian North. Provision of these services over a common-user system would afford efficiency and cost-savings not available by other means; the Department of National Defence would use about half of the satellite's capacity. The ground stations working with *MUSAT* would be small, economical, flexible and easy to operate.... The DOC proposes an engineering definition study phase (EDSP), leading to the construction of a satellite by Canadian industry during the 1981-84 period. The cost of the EDSP is \$1.95 million.

Space Science Program (NRCC)

Canada's last scientific satellite, *ISIS II*, was launched in 1971. A new co-operative space science program has been negotiated with NASA. Its objectives are to sustain and improve Canadian research competence in the space sciences.... The program will consist of three separate contributions to the Shuttle/Spacelab missions; two ground-based observational systems in support of a NASA study of the origins of plasma in the Earth's

(Continued on P. 8)

Canadian trade mission in Venezuela

A major Canadian business mission met with Venezuelan government and business officials recently in Caracas for a series of trade and technology discussions.

The mission was sponsored by the Canadian Association for Latin America (CALA) which was formed in 1969 by a group of Canadian businessmen to develop trade links with South America.

Venezuela is Canada's fifth most important export market — after the U.S., Japan, Britain and West Germany. According to Canadian Government statistics, Canada exported \$575 million to Venezuela between January and October last year. The bulk of Canada's exports are auto parts (70 per cent), followed by newsprint, copper rods and plastics.

Canada is Venezuela's second most important export market with over \$1 billion in 1978 (mostly oil sales).

The 19-man mission included representatives of Canada's major companies in the fields of construction, power, foods and paper.

The visit also included the inauguration of a Canadian-Venezuelan bilateral economic relations committee.

Small hydro demonstration project

The federal and Nova Scotia governments have announced agreement on construction of a project that will reduce the Atlantic region's dependence on imported oil, which accounts for more than 75 per cent of its total energy consumption.

Canada is one of the world's primary producers of electricity from water. It has about 9 per cent of the total flow of all the rivers in the world and, as a consequence, about 70 per cent of all electrical energy is produced from the kinetic energy of falling water. Against the background of declining fossil fuels and rising prices, increasing attention is being given to small hydro plants, installations with a "low head" or small body of water for electrical generation.

A new concept for a horizontal hydraulic turbine will be used in the hydro-electric demonstration project in Nova Scotia.

The new turbine, called "Straflo", was originally developed in Switzerland and offers an estimated 10 percent reduction in capital costs for low head hydro-electric

generating facilities. Although small units (2 megawatts) have been built in Europe, it is expected that units of up to 100 megawatts with hydraulic heads of up to 40 metres can be built in Canada. The Annapolis, Nova Scotia site has the added advantage of being suitable for experimentation on the tidal power application of the design.

In addition to the industrial benefits to be derived from the project, it is hoped that valuable knowledge and experience will be gained on the economics of harnessing undeveloped hydro-electric resources in Canada and that prospects for the development of major tidal energy sites, especially in the Bay of Fundy, will be enhanced.

Indochinese resettling in Canada

The Federal Government recently announced the availability of \$1,310,000 to support and strengthen the work of voluntary, non-profit organizations involved in the adaptation and integration of Indochinese refugees resettling in Canada.

The Federal Government is making \$710,000 available for grants to those groups which are primarily engaged in establishing links between Indochinese refugees and the voluntary sector of the community. The money will assist in meeting administrative costs associated with the activities of the organizations concerned.

The \$710,000 for the grants program will be complemented by \$600,000 that is being made available to other groups and organizations through the already existing Immigrant Settlement and Adaptation Program (ISAP) which is utilized for the purchase of services to immigrants, including refugees. These services include interpretation and counselling.

Organizations seeking ISAP assistance must be incorporated and enter into formal contracts with the Government to provide specific services to individual immigrants and refugees. Currently, about 80 organizations at the community level have entered into such agreements.

The changes now in effect will make funds more easily available through ISAP to some non-profit groups which have contractual agreements with the Federal Government to provide specific services to individual immigrants, and to other agencies who meet ISAP requirements.

These services must not duplicate those provided by the Federal Government, nor those of other levels of government or private organizations operating within the community.

The \$710,000 in grants will help defray the administrative costs of the non-profit organizations which are not now receiving financial assistance through ISAP and are not party to a formal refugee sponsorship agreement with the government.

Low cost satellite transmission

The Department of Communications has demonstrated that two video signals of acceptable quality can be transmitted over a single satellite transponder and received on low-cost earth terminals.

This could cut video transmission costs in half, says Colin Billowes, program manager of direct satellite broadcasting for the department. Communications Research Centre engineers have given the demonstration to the CBC, BCTV and Telesat Canada. Transmission of two video signals over one transponder will be a feature of the British Columbia portion of the department's experimental direct-to-home TV broadcast pilot project.

The Ontario portion of the direct satellite broadcasting project was announced in September and involves transmission of TV Ontario programming to 1.2 m dish antennas placed in individual homes and to 1.8 m dish antennas in community centres and at cable TV head ends. In the B.C. portion, programming supplied by Vancouver CBC and BCTV stations will be transmitted over a single transponder to 1.8 m dish antennas.

Another feature of the project is that 20-watt transponders provide sufficient power for clear TV signals, using the new small terminals. It was assumed previously that at least a 200-watt transponder would be needed for direct-to-home satellite broadcasting.

The *Anik-C* satellite being built by Hughes Aircraft and Spar Aerospace for Telesat Canada will have 16 transponders, each capable of broadcasting one or two TV signals. "If the broadcast service proves out in Ontario," says George Davies, director of the space communication program office at the CRC, "it could be operational in 1982 with *Anik C* and provide a number of TV programs to each of four regions of Canada."

Canadian offshore drilling

Canadian energy companies are pioneering techniques to develop the offshore energy resources of the far north, reports Deborah Shapley in the New York Times, January 15, 1980.

Their attempts to exploit this inhospitable environment reflect the expanding search for energy in areas of the world where drilling once was thought impractical. The far north is believed by some to offer Canada's main hope for energy self-sufficiency late in this decade.

The quest for oil and gas in northern Alaska and northern Canada has largely been confined to land, with some work done from man-made gravel islands in shallow water. But the most promising geological structures lie offshore, where the ice would destroy conventional offshore rigs and platforms.

In Canada, Dome Petroleum Limited and a few other companies have begun to explore these geological structures. The result has been a flurry of technological innovation and adaptation, and some spectacular feats. Oil ships working in "iceberg alley" off the northern coast of Labrador, for example, regularly string cable around icebergs that threaten drillships. The line is pulled taut by two ships, which then maneuver to deflect the berg from its course.

In the Beaufort Sea, where the weather is relatively calm and the water 200 feet deep or less, the main hazard is the pack ice, which can cut a hole in a drillship or destroy the riser, the pipe from the ship to the well.

Ice monitored by radar

Dome, which has drilled ten offshore wells and hopes to begin production here by 1985, uses an advanced-design ice-breaker and supply ships to chop the moving ice into pieces too small to threaten the drillship. But the ultimate defence is for the drillship to quickly disengage from the wellhead, disconnect the eight anchors that hold the ship in position over the well and move away, trailing anchor cables and riser like a stately octopus. Graham Harrison, a drillship captain, said he can seal a well and leave a site within ten minutes of giving the first command. The anchors left behind are marked by buoys that bob to the surface after the ice has passed, and the ship relocates the wellhead by activat-

ing transponders on it.

Arctic oil operators monitor the ice using airborne radar to "see" the ice through cloud cover and darkness.

Innovation at gas well

In 1978, another company, Panarctic Oils, demonstrated at Melville Island that an offshore gas well could produce gas without running a pipe to the water surface and thus through the ice. In a \$23-million operation, a gas well was drilled from a rig built on ice that had been built up to three times its normal thickness by repeated flooding and refreezing. The wellhead was lowered through the ice to the sea floor above the well.

Then, a flexible pipeline was constructed onshore about a mile away. A specially built \$600,000 "plow" dug a tunnel through the ground to the sea floor. The plow was withdrawn and the pipeline threaded through the trench by winches to a location near the wellhead, where it was held in great tension. When the tension was released the pipe sprang

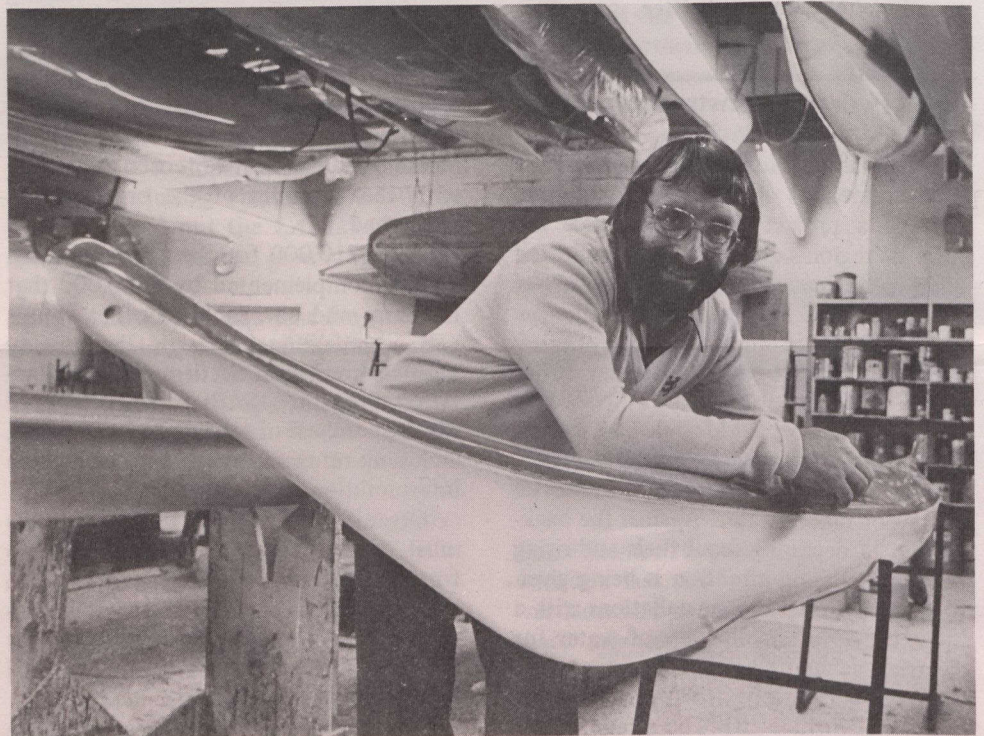
towards the wellhead and "docked" with it at a depth of 186 feet.

Unlike the Panarctic well, most offshore wells pipe oil or gas to the surface, where tankers can load.

Panarctic, which operates a thousand miles from the North Pole, also demonstrated that divers could work in the Arctic's frigid water. A diver, wearing a special suit that maintained his body at the pressure level of the surface, was able to work for five hours at a depth of 915 feet when the water temperature was 27° Fahrenheit. "He came up in 20 minutes, stepped out, and had a cup of tea," said Charles Hethrington, president of Panarctic. Normally divers must take hours to surface to avoid the "bends".

Since 1969, Panarctic has found 16 trillion cubic feet of natural gas in the northern islands, or 21 per cent of Canada's proven reserves. The Government puts the potential reserves of the Canadian Beaufort Sea, where Dome is operating, at 6.9 billion barrels of oil and 60 trillion cubic feet of natural gas.

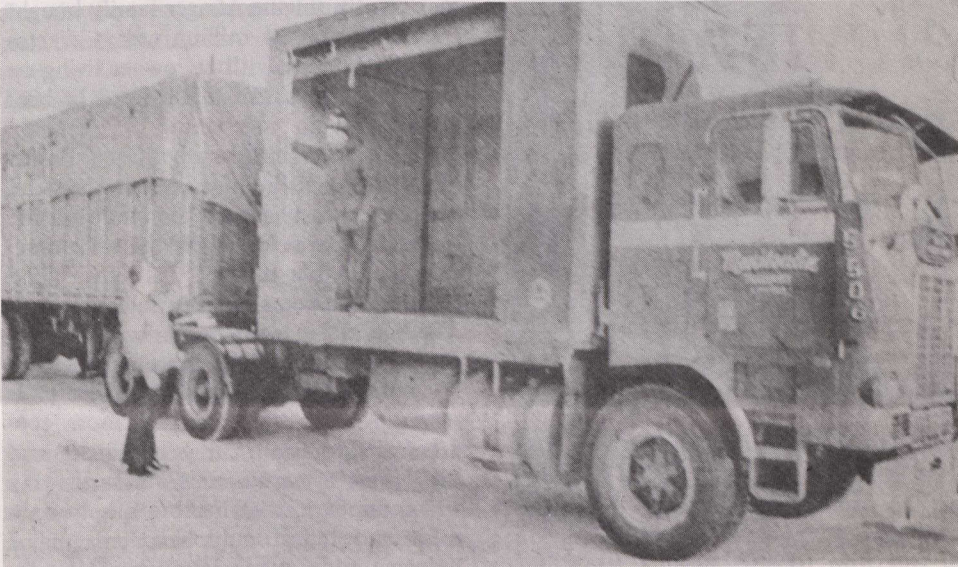
Briton to teach modern canoe building to the Inuit



British canoe designer Frank Goodman is visiting Baffin Island to introduce modern methods of canoe building to the Inuit settlement at Frobisher Bay. Mr. Goodman, who led the first kayak expedition round Cape Horn in 1977-78, is pictured in his factory at Nottingham, in the English midlands, where he constructs his glass-reinforced plastic canoes based on the West Greenland Eskimo kayak. He was invited to Baffin Island by Canadian canoeing enthusiast Peter Baril, and will set up a workshop.

News of the arts

Supertruck a hot idea in the cold north



New truck with heated cargo carrying box is being used in Northern Ontario.

An Ontario company thinks it has come up with a super solution to the problems of trucking freight to and from Northern Ontario.

"Supertruck," a modified tractor-trailer, is being used by Manitoulin Transport Ltd., based on Manitoulin Island, southwest of Sudbury.

The truck is the brainchild of company president Doug Smith and vice-president Wayne Cumming.

What makes Supertruck different from other tractor-trailers is a 13-foot heated, cargo-carrying box attached behind the tractor's cab.

Unlike the majority of the province's trucking companies, the bulk of Manitoulin Transport's business is in Northern Ontario.

Cumming said the first problem Supertruck eliminates is frozen cargo. Winter temperatures in Northern Ontario are so

cold that when the windchill factor is added, even trailers equipped with portable floor heaters cannot prevent freezing.

So when Supertruck heads north carrying general freight from Manitoulin's terminal in Toronto, commodities that can be affected by the cold, such as drugs, are placed in the heated box.

The second and more important advantage of Supertruck begins when the truck starts loading in the North.

The majority of the freight picked up is lumber, steel, paper or precious metals. But the company also ships some general freight south, such as manufactured goods bound for the Toronto market or goods returned by merchants who have received the wrong order.

Before Supertruck, the company had to use a full-size trailer to handle the general freight, although sometimes it was only one-quarter full.

"Now we can put the general freight in the box and still haul a full trailer of lumber," Cumming said.

The box is heated by hot water from the radiator of the Cummins 350 diesel engine, which generates the heat of a forced-air furnace located under the insulated box. A flick of a switch from inside the cab will heat the box to 10 degrees Celsius.

Total cost of each rig is \$102,000. Manitoulin has eight of them now and two more on the way.

New bush camp features solarium-style comfort

In their crude, smoke-filled bunkhouses of the past, loggers could scarcely have imagined the comforts and hotel-like surroundings of a new type of logging camp recently opened by Great Lakes Forest Products Limited some 150 kilometres west of Thunder Bay, deep in the North-western Ontario forestland.

"It's the first of its kind in Canada, and to the best of our knowledge there's probably nothing quite like it in the forest products industry in the rest of the world," a company spokesman said.

The camp's 20,000 square feet of living space are spread over a two-storey structure built in the shape of a hollow square, which provides a fully-enclosed, solarium-style central courtyard where workers can gather after shift in spacious surroundings protected from the frigid cold of winter or the intense heat of summer.

Designed to house 100 workers and staff, the building is carpeted throughout and each employee has a single room with a comfortable bed, writing desk, bookcase and adjoining semi-private washroom facilities.

A professional cookery staff prepares meals in a modern stainless-steel kitchen. Attached to the cookery is the main dining room which is finished in a colour-co-ordinated decor and furnished with tables for four, a far cry from the long wooden tables and benches of past generations when the main staple was salt pork and beans.

Recreational facilities in the new camp include a games room with a pool table, TV room, card room and sauna facilities soon to be built.

A new feature of the camp is the centralized changing area where the workers leave their work clothes in lockers, take

showers and clean up before returning to their rooms. Modern laundry facilities are available in the changing area to enable employees to wash and dry their own clothes.

Practical concept

"While all this may sound fanciful, it is actually a sound practical concept for housing workers in today's highly mechanized and sophisticated woodlands operations," says Morris R. McKay, vice-president, woodlands, operations.

Woodlands operations have changed dramatically over the past 30 years from the old horse-and-sleigh methods to a modern industrial operation requiring new types of employees with mechanical, technical and administrative skills. The company says it must provide appropriate accommodation to attract people of this calibre.

(From The Forest Scene, December 1979.)

Canada to host international conference for disabled

The Canadian Bureau for International Education and the Coalition of Provincial Organizations of the Handicapped in Canada are co-sponsoring a youth conference on travel and exchange for the disabled and their friends in the summer of 1981 in Toronto.

The conference will form part of Canada's participation in the United Nation's International Year for Disabled Persons.

Over 300 delegates are expected to attend from at least 20 countries, including: Britain, Ireland, France, Germany, Switzerland, Austria, Denmark, Japan, India, the United States, Kuwait, Qatar and Bahrein. It is anticipated that approximately 100 Canadians will attend. Most delegates are members of Mobility International, an organization promoting integration through travel and exchange.

Diving a growing trade

Commercial diving is in big demand for workers in Alberta as the province continues to lay more pipelines, says Don Macaulay, diving supervisor at Underwater Specialists Ltd.

"Just this past year our company enjoyed a 50 percent increase in business and increased the staff from about five commercial divers to 14," said Mr. Macaulay. "That says a lot about what is happening in commercial diving."

Commercial diving is not, however, a growth industry; there are only three firms competing for underwater work in Alberta and one of them is based in Vancouver.

About 80 per cent of the job involves laying and inspecting underwater pipes. As long as the oil and gas industry expands in Alberta, Mr. Macaulay predicts prosperous times for the industry.

"Two years ago we were averaging one pipe connection a month. That number has gone up to 12 pipe connections a month. We're constantly on the run," he said.

Polyethylene pipe

One of the major reasons behind the recent success of the diving industry is the introduction of the polyethylene pipe.

"Before the coming of the polyethylene pipe, welders were the most im-



Commercial diving risky but becoming more popular.

portant part of pipe connection. The pipe welder was instrumental in connecting pipes on the surface. We would then take long sections and bolt them together underwater," said Mr. Macaulay.

The new polyethylene pipes allow the divers to do all of the connecting work with heat fusion machines.

Other jobs the commercial diver can do include inspection of underwater facilities, pouring concrete, setting explosives, welding or cutting and helping drive piles. Human error and working conditions make the job of the commercial diver dangerous.

"The smallest jerk by the operators on shore in moving the pipes too quickly might spell your end. There is a lot of tension," says Mr. Macaulay.

Canadian owner for largest ranch

For the first time in its 118-year history, Canada's largest ranch is in the hands of Canadian owners. The Gang Ranch, spreading out over half a million hectares in British Columbia's Caribou region has been purchased by a family group led by Canadian zoologist, Dale Alsager.

The Gang Ranch got its start in 1861 when Jerome and Thaddeus Harper of Tucker County, West Virginia, "took up land at Pike's Riffle" near the geographical centre of British Columbia. Their land holdings increased rapidly until by 1883 they had assembled the vast present-day holdings. Five years later, the ranch

was sold to Thomas Galpin of London, England, and remained in British hands until its purchase by two Montana cattlemen. Not until the Alsager family bought the ranch for \$4 million was it ever in Canadian hands with its owner living on the property, where 6,500 head of beef cattle graze.

The new focus of the Gang Ranch under Alsager's direction is raising buffalo. The huge beast, once so common on the open range, was killed off to near extinction before the turn of the century and most of the remaining buffalo in North America are in zoos or parks. The Gang Ranch is now home to a growing herd of 50 buffalo being raised in their pure strain. Alsager says they are more economical to raise than beef cattle, and their meat is better. He foresees the day when the export of live buffalo, buffalo meat and hides could become a major industry for Canada because of the increasing demand from American specialty restaurants and retail stores.

(From Canadian Scene by Alyn Edwards, December 21, 1979.)

Two-way TV test tried and true

Cable television subscribers in London, Ontario, have had a glimpse of a technology that has futurists fantasizing after a Canadian cable system conducted an experiment with two-way television.

In the first Canadian program of its type, a group of viewers voted on seven questions by merely punching buttons on special converters in their own homes. Thirty seconds later, the tallied results were printed on the screen.

The two-way, or interactive, television allows the viewer to talk back to the cable company through a converter that contains an amplifier that can feed back various signals to a source along cable bands not carrying television or radio channels. The source in this case was a computer at London Cable TV, a division of Canadian Cablesystems Ltd.

London Cable has 3,000 households capable of receiving two-way service and has lent 166 of the special converters to subscribers in one section of the city.

The converters also hook up to fire alarms that can be monitored by the cable company, allow the company to check the signals it is transmitting, and read how many sets are on and to what channels they are turned.

News of the arts

Canada Council changes format

For the first time since 1959, the Governor General's Literary Awards will move outside Ottawa with Governor-General, Edward Schreyer, officiating at the annual ceremony in Vancouver on May 6. In future years, the awards will be presented in other cities across the country.

Also for the first time, the Canada Council will publish in advance the official "short list", naming the finalists, in English and French, in each of the three categories: fiction, non-fiction, and poetry and drama. The six winners will be announced during the week of April 21.

The winning books are chosen by a nine-member English-language jury and a nine-member French-language jury, both appointed by the Canada Council. In making their selection, the juries consider all books of fiction, non-fiction, poetry and drama by Canadian authors published during the preceding calendar year.

The Governor General's Literary Awards were instituted in 1937 by the Canadian Authors Association, with the agreement of the then Governor General, Lord Tweedsmuir, widely known as John Buchan, novelist and historian. The Canada Council, which has administered the awards since 1959, provides a \$5,000 cash prize to each winner. The presentation ceremony in Vancouver will be part of the National Book Festival, which runs from May 2 to 11 this year.

Film and photography festival attracts artists

The Canadian Images Film and Photography Festival took place recently in Peterborough, Ontario, including the screening of 180 hours of Canadian feature, documentary, animated and experimental film. The four-day program of seminars and workshops brought together many of Canada's leading directors, producers and critics.

Highlights of this year's program held at Trent University included two symposia on the *State of the Art and Industry of Filmmaking in Canada* moderated by Pierre Berton and Sid Adilman.

The festival presented recent feature releases: *L'hiver bleu* (André Blanchard), *Avoir seize ans* (Jean-Pierre Lefebvre), *Fish Hawk* (Don Shebib), *Drying Up the*

Streets (Robin Spry) and *State of Shock* (Martyn Burke) and some of the newest films from the National Film Board (NFB), including Peter Raymont's *History on the Run*, Laura Sky's *Shut Down* and Boyce Richardson's *North China Commune*.

Special sessions on "Making Political Film in Canada" and "Experimental Filmmaking in Canada" combined film screenings and discussion with filmmakers. Representatives from film production and distribution co-operatives from across the country screened the newest works by Canada's independent filmmakers. Special presentations included rushes from Martyn Burke's new film *The Last Chase*, a video print of Denys Arcand's *On est au coton*, and a showcase of *Cuban Cinema*.

The National Film Board of Canada presented workshops on animation and documentary filmmaking with Kaj Pindal and Peter Cowan. Special programs included a series of films by and about women, films from the regional studies of the NFB, *Dance Into Film*, *Kids Flicks*, *Canadian Artists Series* and an animation retrospective of the works of Coe Hoedeman, Eve Lambart and Ryan Larkin.

Du Maurier Council announces grant winners

The du Maurier Council for the Performing Arts has allocated \$224,000 in grants to 37 Canadian organizations for projects during the 1980-81 season.

Among the recipients are symphony orchestras, theatre groups, ballet companies and opera associations.

The largest individual grants go to the Toronto Symphony and the Montreal Symphony Orchestra, which receive \$20,000 each. The Vancouver Symphony Society has been granted \$17,000 and the Winnipeg Symphony Orchestra \$13,000.

The National Ballet of Canada and the Royal Winnipeg Ballet will receive \$10,000 each.

The Hamilton Philharmonic Society and the Calgary Philharmonic Orchestra have been granted \$8,000 each; the Edmonton Symphony Society and the New Play Centre in Vancouver will receive \$7,000.

Two grants of \$6,000 go to the Neptune Theatre Foundation in Halifax and Theatre New Brunswick in Fredericton.

Canadian prints exhibited in United States museum



An exhibit of 102 Canadian prints was opened recently at the Mitchell Museum in Mount Vernon, Illinois. The exhibit, which was obtained from Oregon State University, was originally acquired from the Burnaby Art Gallery in Vancouver by the university as a permanent exhibit to tour the United States. Canadian Consul General in Chicago, James Stone (right), who opened the exhibit, views the display with his wife and Kenneth Miller, executive vice-president of the museum. An unidentified visitor looks on.

Space program (Cont'd from P. 2)

neighbourhood; the processing and storage of data from both ground-based and satellite observations; and a mechanism for funding future Canadian responses to NASA's "Announcements of Opportunity". The seven-year program is expected to cost about \$32 million, in 1979 dollars.

Industrial Aspects

With the announcement of a policy for space in 1974, Canada joined other industrialized nations in formally acknowledging the economic, social and scientific benefits that derive from an active involvement in space. From an industrial vantage, the decision to develop an indigenous productive capability was primarily aimed at satisfying domestic

space systems needs, providing high technology employment opportunities and enhancing the industry's ability to penetrate additional export markets.

Considerable momentum in achieving these industrial objectives has been gained over the past five years as a result of government support in the form of policy, program and investment decisions. These measures have enabled the industry to progressively increase its level of competence and responsibility, to develop new skills and products, and to gain in confidence, reputation and competitiveness. The Canadian space industry has advanced considerably from its origin as a supplier of components and as a build-to-print manufacturer. With the award of the *ANIK-D* prime contract to SPAR Aerospace, Canada is on the threshold of having demonstrated a commercial space systems capability....

program. Under the legislation, it will receive \$15 million from Ontario and \$7.5 million from the Federal Government. The grants will assist the company in a \$196.3 million capital works program at its Ontario plants in Thunder Bay, Iroquois Falls, Sault Ste. Marie, Smooth Rock Falls and Thorold. The company also announced a \$300-million, five-year capital expenditure program for its operations in Ontario, to modernize them, comply with anti-pollution standards and improve productivity.

The government of Quebec has set up a new holding company called Nouveler to help develop alternative energy sources in the province in co-operation with the private sector, according to *Canada Report*. Nouveler has an authorized capital of \$50 million. It is 35 percent owned by Hydro-Québec, 35 percent by General Investment Corp., 15 percent by Rexfor and 15 percent by Soquem. At first the new company will have about \$5 million in subscribed capital and it will seek projects in virtually all areas of alternative energy sources.

The Canadian International Development Agency (CIDA) will contribute \$245,000 for the Larreynaga Hydro Project in Nicaragua. The money is earmarked for a preparation study to be made by Shawinigan Engineering Ltd. of Montreal.

The Royal Architectural Institute of Canada has published a 500-page *Handbook on Energy Conservation* described as "a breakthrough in energy conservation documentation" and as "the most comprehensive publication about the technology of energy efficiency in buildings available anywhere". A blend of the fundamental and the specific, the work has been regarded by one authority as a "landmark contribution which will have a profound and beneficial effect, not only on practicing architects but also on their clients". Authored by noted Canadian architects and consulting engineers, the handbook is being marketed in the United States by the American Institute of Architects and outside North America by the Commonwealth Association of Architects in London.

Migrating ducks and geese ate and trampled their way through 23,320 acres of Alberta grain fields last autumn, the manager of the Alberta hail and crop insurance program reported. Ed Patching said farmers received \$882,526 for damage caused mainly by ducks and geese.

social, physical, economic/financial, environmental, legislative or management aspects of housing.

A study of broadcasting in Canada between formation of the Aird Commission in 1928 and enactment of the current Broadcasting Act in 1968 has been published by the Department of Communications. The study, *Evolution of the Canadian Broadcasting System: Objectives and Realities 1928-1968*, by David Ellis, focuses on the main forces which have shaped broadcasting policy. The publication is available in English or French from: Canadian Government Publishing Centre, Supply and Services Canada, Hull, Quebec, K1A 0S9.

An abundance of oil left in the West means Canada could reach self-sufficiency before 1990 with the right economic incentives, according to D.M. McDonald, a director of the Independent Petroleum Association of Canada. "The prevailing thought that Canada no longer has any conventional oil is a fallacy", he told an oil and gas seminar sponsored by the Toronto Society of Financial Analysts. He said it is the independent companies who will find this oil. The multi-national companies will concentrate on costly frontier and oil sands projects because the big fields have been found.

Abitibi-Price Inc. of Toronto says it will receive grants of \$22.5 million under an Ontario-Federal Government industry pulp and paper facilities improvement

News briefs

One of the Canadian paper industry's most difficult corporate and environmental situations will be solved by the acquisition of the Dryden pulp mill by Great Lakes Forest Products Ltd. of Thunder Bay from its current owner, Reed Paper Ltd. of Toronto. Great Lakes has agreed to pay around \$80 million for the mill and will spend another \$130 million to modernize, expand and bring it up to environmental standards.

Canada Mortgage and Housing Corporation has announced details of the CMHC graduate scholarship program for the 1980-81 academic year. Within the total program budget of \$660,000, 50 new scholarship awards will be available this year, together with the renewal of existing scholarships. The awards, based on merit, are for graduate studies at both Canadian and foreign universities. They assist students of high academic and professional promise in their studies of the

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