



Bulletin

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BOOST FOR UNIVERSITY RESEARCH

The National Research Council of Canada has set aside development grants totalling more than \$3 million to university researchers to help them solve problems and make technological advances in such areas as the environment, laser-development, geology, the biological control of mosquitoes and engineering (including agricultural engineering).

These allocations (known as Negotiated Development Grants) are designed to meet the need for increased knowledge in broad areas affecting Canada's economic and social development. They will make it possible for universities to establish multidisciplinary research programs that will have a high element of applied research as opposed to pure research.

The grants will be spread over periods of from one to five years, though the annual instalments are still under negotiation.

Negotiated Development Grants were initiated

by NRC in 1967 to assist universities in developing new or multidisciplinary research centres, particularly in fields relevant to the scientific, economic, resource and regional development of Canada.

NDG applications were first reviewed by committees made up of experts in the fields in which applications drawn from universities, industry, NRC itself and the federal Departments of the Environment, Energy, Mines and Resources, Agriculture, Transport and Industry, Trade and Commerce, as well as the Ministry of State for Science and Technology. Recommendations for grants by these committees were approved by NRC's Committee on Negotiated Grants which is composed of members of the National Research Council and representatives from industry, the universities and certain federal departments.

OCEANOGRAPHIC RESEARCH

Grants to Laval University, Quebec City, will be used by Groupe interuniversitaire de recherches océanographiques du Québec (GIROQ) scientists conducting oceanographic research. This multidisciplinary team is undertaking 44 projects in the biological and physical sciences aimed at determining and interrelating the principal oceanographic properties of four ecological systems in the gulf and estuary of the St. Lawrence River. These include research into the ecology of zooplankton and phytoplankton, and the taxonomy and ecology of benthic algae. The broad project will be of major importance for the economic development of the resources of Eastern Canada and the country as a whole.

The University of Saskatchewan will be provided with grants to apply control-engineering principles to automation in the agricultural industry. The results of the work will probably lead to increased efficiency in the use of farm equipment and reduced production costs of agricultural products, as well as providing a stimulus for increased manufacturing in Western Canada.

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STUDY OF CANADIAN SHIELD

Funds provided by the Council will help the University of Manitoba to obtain an understanding of the various environments that occur within the Canadian Precambrian Shield. The studies will enable the university to relate the distribution of metals to these environments so that the mineral resources can be extracted continuously, and in increasing amounts, in a systematic manner to keep pace with increasing population and advancing technology. This objective represents a first step to determine the history of the earth from its formation to the end of the Precambrian and to demonstrate how its history may be used effectively for the social and economic betterment of Canada.

EARTH SCIENCES

A grant to McMaster University, Hamilton, Ontario, will help expand isotopic and nuclear studies in earth science, an area in which the university already is heavily involved. The funds will enable the departments of chemistry, physics and geology to conduct multidisciplinary research in sediment diagenesis and petroleum studies, ore-formation and ore-prospecting and isotopes-as-tracers in oceanography and studies of ancient rocks.

METALWORK RESEARCH

Other funds granted to McMaster University, Hamilton, will help the university to support a research program in metalworking to be conducted in four main areas — metal-forming, metal-cutting and machine-tools utilization, electrical methods of metal-removal and technological control of production systems. Results of the research will find other uses in various ways through the university's Centre for Applied Research and Engineering Design and its Canadian Institute for Metalworking. It also will result in the employment in Canadian industry of graduate students who did their research in metalworking.

LASER RESEARCH

A grant to Laval University's Laboratoire de recherche en optique et lasers (Laser and Optics Research Laboratory) will enable this multidisciplinary group to expand its laser research. Part of the grant will aid programs in microwave, infrared and optical-communications methods encompassing holography and optical data processing. Another portion is earmarked for research into carbon dioxide TEA (Transversely Existed Atmospheric) lasers, including plasma heating applications. Another project will involve electron-optics research, including studies on organic dye lasers, tunable lasers and non-linear optics.

PEST-CONTROL

Memorial University of Newfoundland will receive grants to support a program of research towards the biological control of mosquito and blackfly pests. This will involve studies aimed at finding other forms of life which would prey on mosquitoes and black-

flies. Studies will also be conducted of possible hazards to the health of wildlife that may be posed by the eventual incorporation of such microbial control agents into integrated methodologies for the effective and selective reduction of mosquito and blackfly populations.

POLLUTION

Grants to the University of Ottawa will be used in a major collaborative research project on a multicomponent analysis of persistent pollutants in a three-mile stretch of the Ottawa River. The project will be multidisciplinary, involving biologists, civil engineers and geologists, in addition to the necessary expertise in chemical analysis and biometrics. More than 30 scientists and engineers will participate in the project. The study will be conducted in collaboration with NRC scientists primarily from the Division of Biological Sciences.

DAY-CARE SERVICES EXPAND

As a result of amendments to the Canada Assistance Plan, the Federal Government will expand its assistance to day-care services across Canada and establish a day-care information centre in Ottawa.

The Federal Government will share not only in staff costs but also in costs of equipment, materials and other operational expenditures. This change reflects interest at the federal level in the development of community services to support the family as the basic social unit of society. Day-care of children is considered an important element in such services. The provisions of the Canada Assistance Plan are directed to low-income families.

The degree of expansion of the nation's day-care programs would depend largely on provincial initiative, Health and Welfare Minister John Munro said. However, Mr. Munro estimated that the additional costs to the Federal Government of extended coverage and expansion would be between \$2 and \$4 million for the rest of the 1972-73 fiscal year, rising in 1973-74 to between \$4 and \$8 million.

The cost of the day-care information centre was estimated at \$50,000 this year and \$75,000 next year.

It is possible in a limited way only to estimate Canada's total need for day-care services. Information, however, indicates that more than 1 million Canadian children have mothers who go out to work and 350,000 of the children are younger than six years. Of these, about 140,000 are looked after daily but only 7,000 are placed in day-care centres.

The necessity for day-care in Canada was pointed up by the Royal Commission on the Status of Women; the Canadian Conference on Day Care, held last year, also recommended that the Federal Government increase its participation in the provision of day-care services, and representations were made on this subject by the Federation of Business and Professional Women's Clubs.

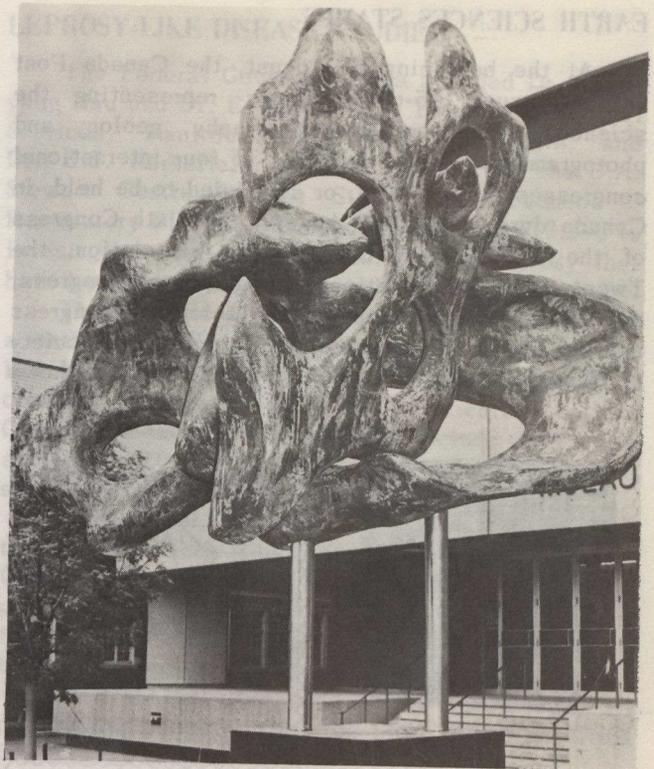
JAPANESE SCULPTURE AT ROM

A monumental sculpture by the Japanese artist Sofu Teshigahara was unveiled recently at the Royal Ontario Museum, where it is permanently installed on the terrace in front of the McLaughlin Planetarium. The work is a gift, through the Ontario Heritage Foundation, of Toronto businessman and art connoisseur Walter Carsen.

The sculpture, entitled "Happy Cloud", is carved in wood, in the traditional Japanese manner, with riveted bronze facings over much of its surface. It stands six feet nine inches high, with a diameter of 105 inches and is mounted on tall aluminum stilts resting on a base of the same metal.

Teshigahara was born in Tokyo in 1900. Before he took up sculpture, he had become internationally known as the founder and headmaster of the Sogetsu School of Ikebana, noted for the study and creation of harmonious arrangements of flowers, branches, leaves, stone, wood, ceramics and organic materials. Ikebana arrangements vary from those occupying the smallest spaces to landscapes and gardens, cityscapes and windowsills.

Teshigahara's skills include calligraphy, sculpture, Ikebana, poetry, painting and philosophy.



Happy Cloud

CONTROL OF FOREST PESTS

A significant advance in the biological control of the spruce budworm, Canada's most costly forest pest, was reported recently by the Canadian Forestry Service.

Researchers headed by Dr. Wladimir A. Smirnof of the Laurentian Forest Research Centre at Ste. Foy, Quebec, and aided by the Quebec Lands and Forests Department have completed an experimental spray program of a 10,000-acre fir forest in the Temiscouata area of eastern Quebec. The heavily-infested forest was sprayed with bacteria (*Bacillus thuringiensis*) improved by an enzyme to speed the effect of their attack on the feeding budworm larva.

The spruce budworm, which has ravaged Canadian forests for many years, is in a severe epidemic state this summer in more than 20 million acres of eastern Canada's spruce and balsam-fir growth. Much of the forested areas under attack has been protected over the years by chemical spray. This special bacteria formulation offers an important alternative, one that does not endanger other species of beneficial insects, plants, fish or mammals.

CFS scientists have studied the use of *Bacillus thuringiensis*, a natural-occurring bacterial disease, against the budworm for several years. The bacteria are licensed for agricultural and forestry use but their effect has been too slow to halt the voracious feeding habits of the budworm during the larval stage of development.

Dr. Smirnof undertook to improve the effect of

the bacillus and reasoned that an enzyme was required to break down the gut wall of the larva and speed introduction of the fatal infection of the budworm's blood system.

Since the rigid structure of the budworm consists of chitin he chose the enzyme chitinase, which had been introduced successfully into spray formulations in over 100 acres in 1971. Chitinase, however, was expensive and not available in sufficient quantities.

BIRD HELP

Dr. Smirnof began looking for a supply in nature and turned his attention to the digestive tracts of birds, which eat insects containing chitin, and found a supply in their stomachs. He then worked with a chemical company to extract 100 grams of chitinase from the entrails of 60,000 chickens acquired from poultry-processing plants.

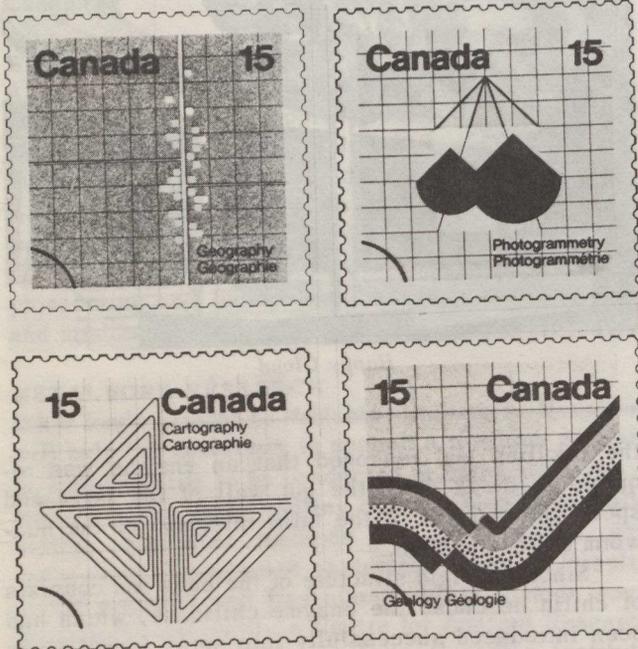
Only a few milligrams of chitinase was used for each acre in the bacillus formulations, but this was enough to accelerate the action of the bacteria and arrest larval feeding. Growth of the trees, which otherwise would have been stripped, continued and the forest is in good health, he said.

The 100-acre plot sprayed last year is flourishing this year, although it is surrounded by an epidemic of budworm. These results suggest that there may be some residual effect of the bacteria, giving promise of long-range control.

General use of the bacillus-chitinase spray will depend upon the low-cost production of chitinase by the new process.

EARTH SCIENCES STAMPS

At the beginning of August, the Canada Post Office issued 15-cent stamps representing the sciences of cartography, geography, geology and photogrammetry – the subjects of four international congresses already held, or scheduled to be held, in Canada during July and August: the Sixth Congress of the International Cartography Association, the Twenty-second International Geographical Congress, the Twenty-fourth International Geological Congress and the Twelfth Congress of the International Society of Photogrammetry. The conferences bring together a



combined total of over 15,000 delegates from some 125 countries.

The presence in Canada of these four international organizations gives recognition to the work of Canadians in the field of earth sciences. The release of four appropriate Canada Post Office stamps, each with a denominative value suitable for use on mail destined for a large part of the earth's surface, provides evidence of the significance attached to these events in the host country.

BILL OF LADING EXPEDITES EXPORTS

A new "door-to-door" container bill of lading issued by Canadian National on July 1 is expected to prove of considerable importance to Canada's export industries.

The document, the first dual-purpose bill of lading issued by a Canadian inland carrier, has also been designed to conform with the international aligned-document system.

It will allow the railway to issue a single docu-

ment to cover the "door-to-door" movement of container traffic from an inland point in Canada to an inland destination overseas.

It will also replace the through bill of lading now used by the railway to cover the movement of export traffic shipped by conventional methods to overseas ports – that is, traffic which does not move in containers.

SPEEDIER PAYMENTS

One of the more significant advantages of the new document is that it will enable exporters shipping goods in containers to obtain documentary credit earlier than is possible with many export bills of lading. "Once we have accepted a shipment and signed the new bill of lading, the shipper is immediately placed in a position where he can, if he wishes, begin converting it to cash through his bank," says R.E. Lawless, CN's vice-president of freight sales. In the past, the exporter usually had to wait until his containers had been loaded aboard a vessel and a clean bill of lading returned to him before he could set about obtaining documentary credit. The delay involved could run from two days to two weeks and more, during which the capital that these goods represented was neither available to him nor earning anything.

"The significance of a through bill of lading which we can issue the moment we accept export goods would be obvious at any time," Mr. Lawless says, "but never more so than in periods like the present, when interest rates are high and profit margins sometimes thin."

Export bills of lading are, in effect, a medium of international exchange. Whoever holds a negotiable export bill of lading has title to the goods covered by the document.

It is not uncommon for exporters to sell their bill of lading to a bank, which sells it to a bank in the country to which the goods are destined, which in turn sells it back to the persons who want to import the goods.

The company expects it will prove of particular benefit to exporters located some distance from Canadian ports and to persons shipping containers overseas.

"Such a bill of lading issued for a container shipment from Winnipeg, say, would cover the through movement of that container all the way to the customer's door in Luxembourg or Leningrad or where have you," Mr. Lawless explains.

He adds that single export documents which cover the through inland-to-inland movements of goods overseas represent the first major change to the bill-of-lading system in decades.

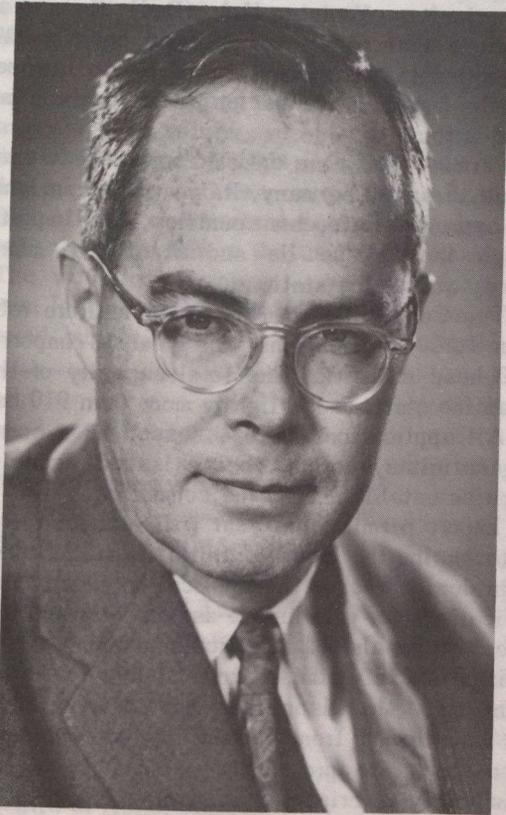
"The international standard format has not yet been fully adopted in Canada, Mr. Lawless says. "But I think inevitably that it will be, and for this reason we were anxious that the new bill of lading conform both to the international standard and the Canadian aligned-document system."

CULTURAL EXCHANGES

Canada is this month again taking part in the exchange program of the Agency for Cultural and Technological Co-operation, which is designed to promote greater understanding and knowledge among citizens of member countries of the Agency.

Visiting Canada from Africa, Asia, the Middle East and Haiti are 38 youthful teachers. After three days in Ottawa, they went to Quebec, from where they formed into three groups - one to visit Ontario, another New Brunswick and the third to Manitoba. The program specializes in modern teaching methods.

In turn, 35 young Canadians from Quebec, Ontario, New Brunswick and Manitoba are travelling in French-speaking Africa visiting in separate groups the Ivory Coast, Dahomey, Senegal, Togo and Tunisia. Their program covers such subjects as government administration, economic planning and development, contemporary and traditional plastic arts and the study of Moslem civilization.



CANADIAN HEADS ILO

John Mainwaring, Director of the International Labour Affairs Branch of the Canada Department of Labour for the past eight years, has been elected Chairman of the Governing Body of the International Labour Organization. Mr. Mainwaring, who represents the Canadian Government in the ILO, will remain as chairman for a year.

LEPROSY-LIKE DISEASE STUDIED

The Federal Government has awarded Dr. Chung-yang Hsu and Dr. E. Snell of the Preventive Medical Services, Manitoba Department of Health, and Dr. E.S. Hershfield, Medical Director of the D.A. Stewart Centre for the Study and Treatment of Respiratory Disease, Winnipeg, a grant of \$18,200 to investigate skin infections resembling leprosy that have been found among some inhabitants of Manitoba.

This medical phenomenon received initial attention in 1969, when a woman who was born and had lived in the province all her life developed a condition that, following tests, led scientists both in Canada and the United States to conclude that, while she was not suffering from leprosy itself, she was suffering from a skin infection remarkably like it.

In May 1970, Dr. R.A. Feldman, a senior scientist at the Centre for Disease Control at Atlanta, Georgia, was asked to assist in elucidating the problem. His investigations led to the discovery of five similar cases in Manitoba and one in the neighbouring state of Minnesota.

In 1971 six more cases were discovered, all possessing characteristics like those of the condition found in the original patient.

Among the common characteristics are:

- (1) The onset of the disease occurs between October and April;
- (2) all the initial areas of infection occur in parts of the body that are normally exposed - legs, arms and eyebrows;
- (3) all patients except one are living in rural areas;
- (4) age incidence at the onset of the disease was either over 50 or under 19;
- (5) the development of the disease was usually rapid and always located in a limited area.

U OF Q COMMUNICATIONS

With 23,000 students and eight campuses extending across 800 miles, the University of Quebec has special communications needs. To meet these and to help "bring the university to the student", U of Q officers met with specialists at Bell Canada to design a custom-made communications system. Now, scientists lecturing from the research centre give courses to students in distant locations. Each campus has instant access to central computers in Quebec City, where all kinds of information ranging from data for research work to student records is stored. The system enables administrators in Chicoutimi, Hull, Montreal, Rimouski, Rouyn and Trois-Rivières to meet regularly without leaving their offices, and written information is transmitted instantly between campuses. Far apart, but never isolated, the University of Quebec's campuses use telecommunications to extend university facilities on a provincial scale.

WHEAT TO U.S.S.R.

The sale of 1.5 million tons of wheat and flour (about 55 million bushels) to the Soviet Union was announced recently by Mr. Jean-Luc Pepin, Minister of Industry, Trade and Commerce, and by Mr. Otto Lang, the Minister responsible for the Canadian Wheat Board.

This purchase is being made under the option clause in the contract for 3.5 million tons announced earlier this year.

In addition, the Canadian Wheat Board has completed negotiations for the sale of 200,000 tons (some nine million bushels) of barley for shipment during the 1972-73 crop year.

When added to the present 3.5-million ton contract, this brings the total sales value of Canadian grain for shipment to the U.S.S.R. from August 1, 1972 to July 31, 1973 to about \$350 million.

Wheat shipments began this month from both the Pacific and Atlantic ports. Barley shipments will move through the West Coast. The sale was concluded in Ottawa between the Canadian Wheat Board and V/O EXPORTKHEB, the Soviet grain-trading corporation, during the visit of the First Deputy Minister of Foreign Trade of the U.S.S.R., N.R. Kuzmin, and Exportkhele President N. A. Belousov. As in previous contracts with the Soviet Union, the terms call for payment in cash at time of delivery.

DIPLOMATIC APPOINTMENTS

The Secretary of State for External Affairs, Mr. Mitchell Sharp, has announced the following appointments, which will take effect during the course of the next few months:

Mr. Henri Gaudefroy, Director-General, Special Advisers Division, Canadian International Development Agency, to be Ambassador to Tunisia, succeeding Mr. D'Iberville Fortier, whose appointment as Assistant Under-Secretary of State for External Affairs was announced earlier.

Mr. Gilles Mathieu, Director, Western European Division, Department of External Affairs, as Ambassador to Ivory Coast, also accredited to Liberia and Niger, replacing Mr. Georges Charpentier, who will return to Canada.

Mr. Clarence Joseph Van Tighem, Minister, Canadian High Commission, London, to be Ambassador to Venezuela with concurrent accreditation to the Dominican Republic, replacing Mr. Donald Sutherland McPhail, who is returning to Ottawa.

Mr. Wilfred Kenneth Wardroper, Director-General, Bureau of Economic and Scientific Affairs, Department of External Affairs, to be High Commissioner to

Nigeria and concurrently accredited to Sierra Leone, succeeding Mr. A.S. McGill, who is returning to Ottawa.

The following appointments are effective September 1:

Mr. Lawrence Joseph O'Toole, Director-General of Finance and Administration, to be Assistant Under-Secretary of State for External Affairs (Administration). He succeeds Mr. W.H. Barton who, as announced earlier, will be the Canadian Ambassador and Permanent Representative to the Office of the United Nations at Geneva, and to the Conference of the Committee on Disarmament.

Mr. Georges-Henri Blouin, Director-General of Personnel, to hold the additional appointment of Special Adviser to the Under-Secretary of State for External Affairs on foreign service appointments and related policies. He will also be the External Affairs representative on the Personnel Management Committee of the Interdepartmental Committee on External Relations.

CATTLE IMPORT PERMITS

Agriculture Minister H.A. (Bud) Olson recently announced that import permits had been granted to 613 applicants to import 911 cattle from Europe this year; the maximum number of cattle for each permit-holder is four.

Permit-holders are entitled to purchase cattle in Austria, France, Germany, Italy and Switzerland, the only approved European countries, and import them through the Grosse Ile and St. Pierre maximum-security quarantine stations.

The Canada Department of Agriculture received about 1,400 applications this year to import some 6,000 head of cattle. The total capacity of the two quarantine stations is slightly more than 910 head.

All applications were assessed by a committee of geneticists, permits being issued according to priorities established by the committee.

Import permits this year will restrict the holder to purchasing the breed of animal from the country of origin designated on the application form. "Because applications for permits are assessed on the basis of project proposals for a particular breed, we feel it is a fair policy to restrict permit-holders to their stated intentions," Mr. Olson said. In future years, imports may be allowed from other European countries and discussions are progressing aimed at establishing satisfactory veterinary agreements.

The cattle will undergo preliminary quarantine in Europe and arrive at the maximum-security quarantine stations in the autumn. Providing they meet health requirements, they will be released from quarantine in the spring.