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CANADA CONSIDERS STOL FLIGHT

The preface to a special study on aeronautics prepared for the Science Council of Canada states that it seems likely that future aeronautical research and development activities in Canada may be related more to civil aviation than to defence needs. The results of the study indicate that the most promising prospects open to Canadian manufacturers of complete aircraft appear to depend on their existing and potential capability to design and develop short-take-off-and-landing (STOL) aircraft systems.

The study points out that in the densely-populated industrial areas of the world ground-transportation systems have become saturated, or are approaching saturation, with no easy solution in sight. Short-haul air trips of under 250 miles are hampered by the facts that existing aircraft require vast airport areas and that ground congestion can cause portal-to-portal travel times of up to four hours.

Development of vertical take-off and landing (VTOL) aircraft systems promises to relieve this short-haul dilemma but only when problems of VTOL noise control and economics have been solved. It is

very likely that the evolution will see short take-off and landing aircraft as an intermediate stage of development with a gradual introduction of the VTOL concept.

CANADA AMONG THE LEADERS

It has been estimated that Canada currently has a one-to-two-year lead over many other industrial countries in STOL technology. To exploit this lead, the Federal Government has been asked to give the go-ahead to a proposal creating a new transportation system based on STOL aircraft. A consortium of 16 aerospace companies has proposed that the Government become a major partner in Regionair STOL Canada — a demonstration service designed to show that STOL aircraft are the interim answer to transportation congestion problems in densely populated areas. The Regionair proposal calls for the Government and the aerospace and air-transport industries to co-operate in a two-phase operation designed to produce an operating STOL system by mid-1972.

The definition of "short take-off and landing" is arbitrary, but the generally accepted field length is about 2,000 feet. Various means of operating from such fields have been evolved; the most promising current technique makes use of deflected propeller slipstreams to provide additional lift to an aircraft's wings.

The *Twin Otter*, manufactured by the Havilland Aircraft of Canada Limited, is in this category. It was chosen as the operating aircraft for the initial phase of Regionair because it had been a success in commercial air transport operations round the world. This 14-passenger aircraft would remain in service until a new mode of service could be inaugurated (possibly by mid-1974) using the de Havilland DHC-7, a 48-passenger, four-engine turboprop. It is the only aircraft of its size or larger that would be available

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in the next three to five years and meets noise criteria for city-centre operation. The DHC-7 is currently undergoing final model tests and is programmed for production in 1973.

#### POSSIBLE ROUTES

Initial routes under consideration call for STOL service between two points in Vancouver and Victoria, two in Toronto from the Niagara peninsula, and two in Montreal from Ottawa, with later links to the new airport at Ste Scholastique. These are typical routes and reflect the 100-miles-or-less operating range dictated by choice of the *Twin Otter*.

The project calls for construction of three types of STOL "port" within cities - high-density capacity ranging from one to four million passengers a year and low-density capacity ranging from one-half to two million passengers a year. There also will be STOL strips at airports capable of handling either low-or high-density traffic. These strips will be integrated into major airports. The total STOL system incorporates aircraft, STOL ports, navigational aids, air-traffic control, and other supporting services.

#### COSTS

Based on unchanged operation over the three routes outlined, the major capital expenditures would be \$8,400,000 for 14 *Twin Otters* at \$600,000 each and \$36,600,000 for seven high-density and two low-density STOL ports. Total annual operating costs for the 14 aircraft operating 3,600 hours a year is estimated at \$7.5 million.

Estimating revenues at \$1 a passenger year, supporters of the project expect the system is not likely to break even with only 14 planes. Expansion of routes and introduction of the DHC-7 is expected to change this projection.

#### BENEFITS TO CANADA

Backers of the Regionair plan draw on the eleventh report of the Science Council to cite the benefits Canada would derive from a fully functioning STOL system. These include sales of \$500 million to \$1,000 million in aircraft alone; 28,000 to 56,000 man-years of employment in high technology industries from aircraft sales alone; equal travel opportunities to large and small communities; improvement in the environment in areas of pollution, congestion, noise and land-use; suitability of STOL for northern development and reduction in government expenditures through delaying expansion of existing airports.

The program would call for a total net investment of \$150 million. Designing and developing STOL aircraft and putting them into production could cost between \$75 million and \$80 million. The cost of STOL ports is estimated at \$5 million each, with supporting services for five STOL ports set at about \$50 million. An unspecified amount would also be needed for feasibility studies and long-term developments aimed at maintaining Canada's lead in STOL technology.

#### NRC PARTICIPATION

A significant part of any such long-term development work would involve the National Research Council of Canada, whose laboratory facilities devoted to aeronautical research, carrying a \$49-million book value, have over the past 25 years, been involved in support of the design, construction or operation of every significant aircraft and engine type built in Canada.

A recently-completed \$7-million low-speed wind-tunnel with a 30-foot-square working section, was constructed specifically to be of assistance to industry in the V/STOL fields. The first aircraft company to use this facility on a time-rental basis was de Havilland, with a scale model of its DHC-7. Canadair Limited of Montreal followed immediately after with a propeller component for an experimental four-engine propeller-driven tilt-wing experimental V/STOL aircraft. The wind-tunnel is a major component of the Low Speed Aerodynamics Section of NRC.



The de Havilland DHC-7 STOL aircraft undergoes tests in NRC'S new huge wind tunnel.

#### UNEMPLOYMENT INSURANCE CLAIMANTS

There were 222,000 initial and renewal claims for unemployment insurance benefit filed in March. This was 8 percent more than the 206,000 filed in February and 9 percent more than the 203,000 filed in March 1970.

At 857,000, the number of claimants at the end of March was 4 percent less than 888,000 at the end of February but 22 percent more than the 705,000 registered on March 31, 1970.

Benefit payments totalled \$114 million in March, \$101 million in February and \$84 million in March 1970. The average weekly benefit payments for these 3 months were \$35.74, \$36.47 and \$35.36 respectively.

## HUGE WHEAT SALE TO U.S.S.R.

The sale of 3.5 million tons (about 130 million bushels) of wheat to the U.S.S.R. was announced at a press conference earlier this month by Mr. Otto Lang, Minister responsible for the Canadian Wheat Board, and Mr. Jean-Luc Pepin, Minister of Industry, Trade and Commerce.

The value of the contract, which was negotiated by the Canadian Wheat Board with V/O Exportkhleb, the Soviet grain-trading agency, is approximately \$235 million. Delivery, which will begin this month will continue throughout 1972.

"The sale involves two separate contracts," the Ministers said in a joint statement. "The first contract is for 1,030,000 long tons (38.4 million bushels) to be shipped this calendar year. This completes the outstanding purchase obligation under the agreement signed by the Canadian Wheat Board and V/O Exportkhleb on June 14, 1966 for 9 million long tons of wheat. The second contract covers an additional sale of 2,220,000 metric tons (81.5 million bushels), of which 970,000 metric tons will be shipped this year and the balance in 1972. Of the total quantity, 350,000 metric tons will be shipped in the form of flour."

In addition to the above firm commitments, the buyer has the option to purchase a further 250,000 metric tons for shipment during the period from May to July 1972.

Shipment of the wheat will be made from both Pacific and Eastern Canadian ports, with the buyer having the option to ship a portion from Churchill during the 1971 navigation season.

Grades to be delivered during 1971 are Nos. 2, 3 and 4 Manitoba Northern and No. 1 C.W. Red Spring Wheat - 13 percent protein. The buyer also has the option of taking No. 3 and/or No. 4 Canada Western Durum wheat as part of the whole purchase contract. Grades to be delivered in 1972 will be negotiated at a later date.

As in previous contracts with the U.S.S.R., the terms of the sale call for payment in cash at the time of delivery.

## AID TO REFUGEES

An initial allocation of \$680,000 by the Canadian Government for emergency relief for refugees from East Pakistan has been announced by the Canadian International Development Agency, to be made to international and voluntary agencies.

A total of \$300,000 is being provided through the UN High Commissioner for Refugees, which is acting as the co-ordinating body for UNICEF, the World Food Program and the World Health Organization. UNICEF is providing medicine, food, clothing and shelter for children and mothers, the World Food Program is providing food, and the World Health Organization is sending massive air-shipments of

cholera vaccine, rehydration fluid for cholera victims, and general medical supplies.

A further \$100,000 is being provided to the League of Red Cross Societies, which is providing milk-feeding stations and medical treatment facilities.

The remainder of this first allocation is being provided to Canadian voluntary agencies. Oxfam of Canada which is receiving \$150,000, is shipping all the supplies of cholera vaccine available in Canada. Other grants are being made to the Canadian Council of Churches (\$40,000), the Canadian Catholic Organization for Development and Peace (CCODP) (\$40,000), and the Mennonite Central Committee (\$50,000).

The allocations have been made after consultation with the UN agencies, the Red Cross and other organizations to establish priorities and to co-ordinate the types of relief being supplied. There is a particular need for cash grants, since many of the needed supplies, such as medicine and blankets, can be purchased locally for less than it would cost to ship the goods to the area. The Canadian capacity to supply medicines of the type needed is limited, and the organizations receiving grants can get the pertinent medicines more readily. They can also supply food during this initial period of relief.

The Canadian Government has provided a total of \$2,050,000 to meet this emergency. A contribution of \$50,000 was provided as a result of the League of Red Cross Societies appeal launched on April 30. It was used to purchase mobile dispensaries for the Indian Red Cross. The second contribution of \$2 million was announced in the House of Commons on May 28.

Other requirements are being closely watched, and the allocation of further funds will be announced shortly.

## CANADA-U.S. FIRE-FIGHTING PACT

Canada and the United States have signed a co-operative agreement for fighting forest fires along the Yukon-Alaska border, Mr. Jean Chrétien, Minister of Indian Affairs and Northern Development, announced recently.

The agreement establishes buffer zones ten miles wide on either side of the border where parties from either country can start to fight a new fire at once without applying for formal permission or documents of any kind.

Weather information will be shared during the fire season through the installation of weather-recording instruments within 50 miles of the buffer zone.

An exchange of diplomatic notes between the Canadian Embassy in Washington and the Department of State confirmed the arrangements, which are outlined in a memorandum of agreement signed last month by Mr. Chrétien and Rogers C.B. Morton, Secretary of the Interior.

"A border line drawn on a map has no meaning

when it comes to protection of our wildlife and natural resources," Mr. Chrétien said.

In Washington, Mr. Morton said that the best interests of both nations would be served by this pact.

The Yukon Forest Service of the Department of Indian Affairs and Northern Development is the agency responsible for fire control in the Yukon Territory, while the Bureau of Land Management of the Department of the Interior has that responsibility in Alaska.

### CLAMPDOWN ON WATER POLLUTERS

"Waterborne litterbugs" whose travels along Canada's waterways are invariably traceable by trails of floating bottles, empty cans and miscellaneous refuse, will find their carelessness costly from now on.

New "garbage pollution prevention regulations" within the Canada Shipping Act will enable the courts to assess a fine of up to \$5,000 against persons guilty of dumping garbage into Canadian waters, Transport Minister Don Jamieson said last month.

To ensure that offenders will meet their just dues when found guilty in court, the terms of the wording of the regulations are clearly defined by law. The regulation states that "no persons shall discharge or permit the discharge of garbage from a vessel into Canadian waters".

The term "vessel" is described as "including any ship or boat or any other description of vessel used or designed to be used in navigation". Garbage

is defined as "solid galley-waste, paper, rags, glass, plastics, metal, bottles, crockery, junk or similar refuse".

The regulations authorize Ministry of Transport inspectors to board any vessel for inspection and require boat-operators, masters or crew-members to provide inspectors with such information as they may require.

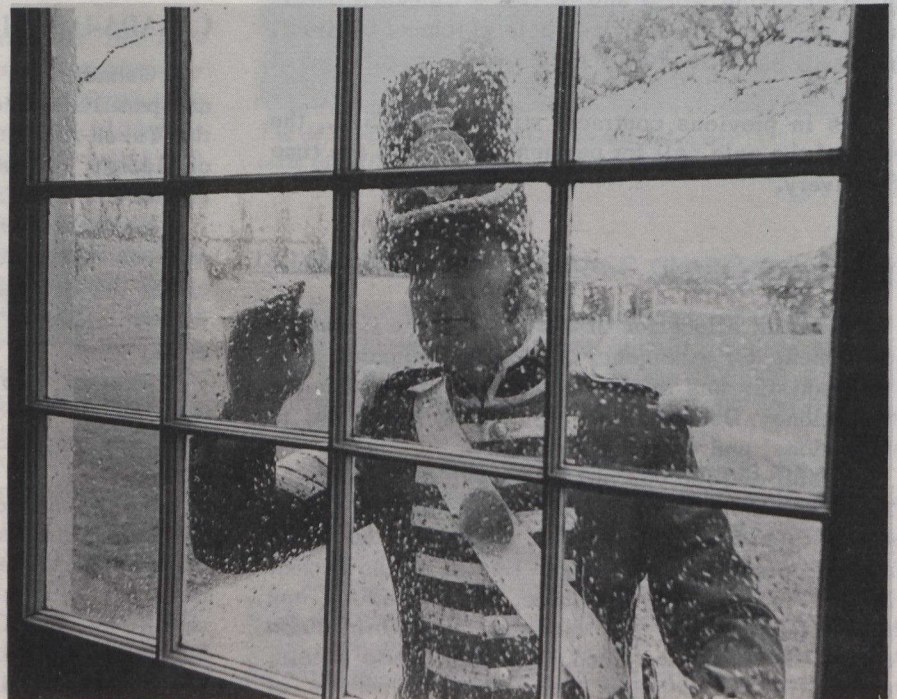
### OIL DEFINITION BROADENED

Another step in the fight to combat pollution of Canadian waters is an amendment newly introduced in the Oil Pollution Prevention Regulations under the Canada Shipping Act. New and broader definitions of terms "oil" and "oily mixture" are now in effect. "Oil" now includes "petroleum, fuel-oil, sludge, oil-refuse and oil mixed with waste other than dredged spoil". The term "oily mixture" is now defined as "a mixture with any oil content" and, for clarification of one part of the regulations, as "a mixture with an oil content of 100 parts or more in 1 million parts of the mixture".

The new definitions will make convictions possible on charges of oil pollution in which there formerly might have been a question as to whether the substance spilled into the water was actually oil within the meaning of the former legal description.

Fines of up to \$5,000 are authorized by the regulations for discharge of oil or oil mixture into Canadian waters under the Oil Pollution Regulations. During 1970, Ministry of Transport officials laid a total of 57 such charges. There were 51 court convictions, with fines totalling \$71,530.

*Caught in the rain outside the officers' mess, Fort York, Toronto, Sergeant John Hankin raps on the window seeking shelter. The pageantry of the old fort, established by Governor Simcoe in 1793 and today maintained as a historic site and museum, is enhanced by the activities of a small "garrison", wearing a uniform of the 1812-14 period, modelled on the uniforms of the British infantry of the line units such as the 8th (or King's) Regiment. Sergeant Hankin and his brothers in arms post sentries, carry out artillery drill and perform the other duties of Fort York's original garrison.*



Globe and Mail

## TRADE MISSION TO CHINA

Mr. Jean-Luc Pepin, Minister of Industry, Trade and Commerce, will lead an economic mission to China on June 25 at the invitation of the Chinese Minister of Foreign Trade, Mr. Pai Hsiang-Kuo. The Canadian party will return on July 4.

Mr. Pepin will be accompanied by some ten representatives of major Canadian trade and economic associations and a group of senior officials from federal departments concerned with economic relations between Canada and China. The business members will represent important sectors of Canadian economic activity, including agriculture, forestry, mining, manufacturing, banking, export and import interests.

The mission will spend four days in Peking, meeting with economic ministries and with the seven state trading corporations that conduct all China's international trade.

Mr. Pepin said that Canadian businessmen have shown great interest in China since that country's diplomatic recognition by Canada. "I am confident this mission will provide us with a better understanding of opportunities for broadening economic relations with China and will lead to increased trade between our two countries," he said.

## AGRICULTURAL IMPORT INTERCEPTIONS

Tourists and Canadians returning from abroad are leaving large numbers of prohibited plants, meats and other agricultural items behind them following customs inspection on their arrival in Canada.

To protect Canada's important agricultural industry from plant and animal diseases and pests being brought into the country on imported materials, tight restrictions govern the entry of meats, meat and animal products, plants, and plant products (cuttings, bulbs, fruit, etc.) from overseas. A plant with soil clinging to its roots can carry any of the many destructive species of nematode, and a small piece of sausage can carry the organism which causes foot-and-mouth disease. (Except for an outbreak in 1952, which was speedily stamped out, Canada has been free of this costly disease.)

The increase in air traffic in just a year is partly reflected in the latest report (1969-70) of the Department of Agriculture's pest identification laboratory, when over 1,000 destructive pests were intercepted at ports of entry. The report notes that one out of three came from air passengers' baggage. Even in the heavy travel year of Expo 67, the ratio was one in six and in 1968-69 it was one in 20.

## SPEEDIER INSPECTION

Faced with the prospect of increases in both the frequency of flight arrivals and the size of aircraft, experts of the four federal agencies involved with inspection work at ports of entry - Agriculture,

Customs, Health and Immigration - began working on ways and means of speeding up passenger-handling at Canada's international airports. The result of their work was the primary inspection-line system that went into operation last year at Montreal, Toronto and Vancouver air terminals. A similar system is being introduced at Halifax, Gander and Winnipeg. Customs officers manning these terminals are given special training to increase their effectiveness in carrying out inspection work for the other departments.

For many inbound passengers, the integrated scheme means a one-stop inspection and elimination of delays for agriculture, immigration and health checks. But others, depending on circumstances, may be sent for secondary and more intensive inspection and every piece of baggage may be searched.

A further safeguard is provided by roving customs officers who may subject certain passengers to a second inspection after they have claimed their baggage.

Statistics show that the speed-up in passenger-handling hasn't been achieved at the cost of reduced thoroughness in inspection.

Last year, passengers arriving at Montreal, Toronto and Vancouver from overseas forfeited more than 17,000 pounds of prohibited and potentially hazardous meat and animal products, and hay and straw packing. The lengthy list included such items as sausage, bacon, canned meats, hides, horns and furs.

Other passengers last year were relieved of some 18,000 plants and 8,100 pounds of plant products. The diversified items included potatoes, wheat sheaves, apple, pear and plum rooted tree stocks, heather, grape vines, geraniums, onion sets, conifers, bamboo sticks, snails, mushrooms, live insects, cashew nuts, driftwood, seed necklaces, Polynesian ornaments made from plant products, and even some tiny, packaged palm trees.

## FAILURES IN PSYCHIATRIC TRAINING

Dr. Dennis Kussin, president of the Association of Residents in Psychiatry at McGill University, Montreal, has been heading a study on the "astonishingly high failure rate among psychiatric residents taking the Royal College of Physicians and Surgeons certification exams" (*The Medical Post*, February 9, 1971).

In 1969, 60 per cent of 189 candidates writing psychiatric certification in Canada failed; in 1968 the failure rate was 57 per cent. According to the residents, the Quebec failure rate is even higher, at 70 per cent.

Dr. Kussin promises a thorough probe. "We must find what the problem is, define it and determine how to deal with it." He admits, however, that the root of the trouble may lie in the lack of unity within the profession.

Since the introduction and success of the

"psychoactive" drugs in 1954, pioneered in North America by Dr. Heinz Lehmann of Montreal's Douglas Hospital, psychiatric ranks have fallen into increasing disorder. "One of the difficulties in teaching psychiatry is deciding what should be taught," says Dr. Kussin. "There are so many different theories. Each school has its own approach."

McGill associate professor Dr. Thomas Ban, author of *Psychopharmacology*, a recently-published text on drug therapy, and an outspoken critic of current psychiatric practice, accepts the residents' diagnosis. "The high failure-rate results from the fact that there is not a co-ordinated body of knowledge within the discipline," he says.

#### METHODS OF TREATMENT

Dr. Heinz Lehmann, whose 1954 paper on chlorpromazine, the first of the major tranquilizers, gave the first indication to North American psychiatrists of the role drugs might play in the treatment of mental illness, believes a better balance must be achieved in the training of psychiatrists. Too much emphasis is now placed on psychodynamics - roughly the Freudian theory of mental forces in action, he says. "The ideal psychiatrist is someone who is completely at home with drugs and shock treatments and who knows as much about them as he does about psychodynamics. Unfortunately not too many psychiatrists fall into this ideal class."

Dr. Lehmann points out that psychoanalysis can help the neurotic but not the psychotic and that in certain illnesses such as schizophrenia it would now be considered impossible not to give drugs. "Drug therapy works faster and is more reliable and we don't teach enough of it - that's true," he says. Residents in psychiatry receive two hours of private tutoring a week and, in most hospitals associated with the McGill Diploma Course in Psychiatry, both hours are devoted to psychodynamics.

"At Douglas Hospital we've substituted one hour of ward management which includes some drug work but it's definitely the poor relation," Dr. Lehmann says.

Dr. Lehmann declares that in the past it has been difficult to convince residents that training in drugs is as important as training in psychotherapy. "Psychodynamics with its human interest was always beating all comers," he says. He expects, however, that this difficulty will soon disappear. "The new wave of medical students whose social consciousness is infusing the medical schools, recognize that you cannot afford to amuse yourself spending six hours a day with six patients."

#### ANTS VERSUS FOREST PESTS

If an experiment now being conducted in Quebec by federal research scientists is successful, the humble ant may help man in his fight against tree-destroying insects.

Two species - one from Manitoba and one from Italy - will be used in the experiment by Dr. Raymond Finnegan, of the Canadian Forestry Service based at Ste-Foy, Quebec. The ants are known to prey on other insects, attacking them mainly in their immature states of development. Dr. Finnegan hopes they will be interested in the jackpine sawfly, one of the many insect pests which take an annual toll of Canadian forests.

For the past six years Dr. Finnegan, an entomologist and forestry engineer and leader of a group studying ant behaviour, is convinced that the insects can be used to control tree pests. He has carried out extensive work in Quebec, and has developed man-made anthills built in the laboratory, enabling control of their feeding habits and behaviour.

#### EXPERIENCE IN ITALY

While on a visit recently to the Institute of Agriculture at Pavia, near Milan, Italy, Dr. Finnegan observed the extensive use made of ants to control infestations of insect pests in that country. He decided to carry out his experiments in Canada with two species - one (*formica lugubris*) imported from Italy, and a Manitoban variety (*formica obscuripes*).

Taking advantage of expected sawfly attacks this year, well-populated anthills will be introduced into the upper Saint-Maurice area of northwestern Quebec, to evaluate the ants' efficiency in freeing a wooded area from the pests. Both species of ant are known to be voracious predators, preferring to attack insects feeding in large groups. The experiment will be strictly controlled to exclude the possibility of harmful results from the introduction of the new ants.

Dr. Finnegan and his associates are also carrying out research on natural anthills near Drummondville, Quebec, where they have surrounded an anthill with a three-foot-high fence, buried to a depth of two feet. The fence is so designed that, though the insects can leave their hill freely on foraging expeditions, to return with their prey they must pass through tubes controlled by the researchers. In this way, specimens may be captured and their feeding habits, work capacity and other data recorded.

Thus the ant, whose highly-developed social life often pits it against man as master of the world in science fiction, may become our ally in the fight against natural enemies.