



CANADA

CANADIAN WEEKLY BULLETIN

INFORMATION DIVISION • DEPARTMENT OF EXTERNAL AFFAIRS • OTTAWA, CANADA

Vol. 21 No. 50

December 14, 1966

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WORLD WITHOUT DISTANCE

The following partial text is from a recent address by Mr. John N. Turner, Minister Without Portfolio, to the seventeenth annual conference of the Institute of Electrical and Electronics Engineers in Montreal:

...This is an appropriate time for us to look to the future for in Canada we are about to celebrate the centennial of the birth of this country. One hundred years, measured against the backdrop of history, does not seem a long time. But it will seem even smaller and less relevant in the world of tomorrow. In Canada, during the next 35 years, we shall virtually rebuild and transform our country. In this span of time, more houses, schools, plants, parks, apartments and office buildings will be built in Canada than in all the 432 years since Jacques Cartier first touched our shores.

Man has reached the greatest heights and depths of the earth and is preparing for journeys far beyond the sky. Yet only 100 years ago the poles were utterly unknown. Much of Africa was still as mysterious as in the time of King Solomon. No human being had descended more than 100 feet into the sea or risen more than a mile into the air. We have gone so far in so short a time. We shall go much farther and much faster if man outlives his adolescence and does not destroy himself with his own toys. We shall have moved within our lifetime farther down the road of history than did all our ancestors since the recorded history of man.

ELECTRONICS IN THE VANGUARD

You, men of electronics in an electronic age, are in the vanguard, rolling back the boundaries and fron-

tiers of knowledge. You will play a key role in determining the nature of our environment and the conditions of our life for the next century. Dramatic progress has given us a virtually instantaneous global system in communications and transportation. Indeed, we soon must decide or choose between competing superlatives in communication and transportation. If travel becomes instantaneous, will anybody bother to communicate? Or, if communication becomes so real and vital in terms of bringing other parts of the world to our doorstep, will anybody bother to travel? Communications will improve until all our senses - and not merely our vision and hearing - can be projected anywhere on the face of the earth. I hope it will not happen as...E.M. Forster predicted in his short story *The Machine Stops*, that our remote descendants will live in single cells, scarcely ever leaving them, because they are able to establish instant television contact with anyone else on the earth wherever he might be.

All around us massive strides are being made in communications. INTELSAT, the international telecommunications satellite consortium, has opened a fresh approach to the management and development of a world-wide communications system. Many of you are familiar with COMSAT, the communications satellite corporation, which is controlled jointly by the U.S. common carriers, the telephone and telegraph companies and the American public. Its role is to develop the U.S. overseas service and also to act as a contractor for INTELSAT for the construction and launching of satellites. This is a fresh, new institutional approach to a fresh series of problems.

ROLE OF CANADA

We in Canada, as members of INTELSAT, hope to play a continuing and influential role in the growth of satellite communications. Throughout the world, in the United States and currently in Canada, extensive discussions are taking place to determine the opportunities that are opened up by the use of these space satellites for the satisfaction of domestic communication requirements. A recent proposal placed before our Government put forward a domestic satellite system as the communications vehicle to cover our country from coast to coast and from the border to the Arctic - for message traffic, radio and television. Spearheaded by a private broadcaster in Canada, typical of an always active and exuberant segment of our business community, and supported by a leading space-electronics company, they contemplate a body called CANSAT which would be somewhat parallel to COMSAT in the United States. Another interesting proposal for using satellites has been made by a leading commercial communications company which has been actively studying the opportunities opened by satellite communication and plan to build an earth station in Canada to test the practicality of this concept. I have confidence that these imaginative proposals will be followed by many others in all fields of endeavour as we build a second Canada....

CANADIAN ELECTRONICS

Innovation and technology know no boundaries. We in Canada are aware that, if we are to play a role to the benefit of both Canadians and the world, we must determine where best we should employ our efforts and talents. The easy route would, of course, be to sit back and wait for our American friends alone to perfect and implement such a satellite communication system. But this would accelerate the growth of a branch plant economy in Canada. The steady allure of research and engineering opportunities in the United States for the scientists and engineers we have trained demand that we create comparable opportunities in Canada. A brain drain is not part of our policy to build the second Canada. We must specialize. We must do our own research. We must use our own brains. We have proven in Canada, particularly in the electronics industry, that we can lead the world in certain major developments. The *Allouette* space satellite was one of the most successful and reliable of any similar space probes. These are continuing. The Canadian electronics industry is a \$700-million a year business today and engages over 50,000 people. Exports are currently running at about \$100 million a year - a healthy 14 per cent of its output. This export is not metal bashing or sub-assembly fabrication from U.S. branch plants in Canada. Rather, for the most part, it covers electronic products and systems developed in Canada and vigorously marketed throughout the world. Let me cite a few examples: airborne doppler navigation equipment, in use in over 3,000 planes of more than 30 types; flight simulators - more than \$35-million worth of exports; wideband microwave relay systems - over 20,000 route miles in 13 countries; digital to video displays - this system, termed DIVCON, was in use by each of the three American networks in the

recent elections and is finding wide applications throughout the world, in stock markets, the broadcast industry and in airline operations; communications satellite - we have a strong integrated capability in this field and expect to glean a fair share of the some quarter billion dollars world market for such stations that will girdle the earth....

AN INTEGRATED APPROACH

...As competition intensifies research becomes even more imperative - and more costly. Research is now so expensive that there is little room for wasteful duplication or unnecessary work. Research must overlap to some degree to advance swiftly. But clearly the time has come for some co-ordination - and on a grand scale. What you and we must do is to determine where each of you in the private sector will best serve and promote electronic development. We must devise new ways of setting priorities in the electronics industry so that all our human skills and talents can be fully utilized for the future. What I am calling for is an "integrated" approach to research development not only by Canadians, but by Americans. Each of our countries must determine how best to serve its own private and public interests by the co-ordinated development of new technology. I am calling for an "interface" between governments, and governments and the private sectors. Each of us should be given priority to do what we do best within a joint plan. In this way no brains will be wasted - and research will follow well-co-ordinated specialties within our joint overall programme. I hope you will not consider this a "spurious" approach, which might founder because of the "parasitic" tendencies from within the industry itself.

CANADA PROVIDES A MODEL

Canada's communication system is unique. On one hand, there is a group of telephone companies that act in concert to provide national services and, on the other hand, there are two railway companies providing services, each of which is national in scope. All companies provide a most comprehensive total communications network. Television relay, data exchange, telex, conventional telephone and standard telegraph transmission services are all included. These systems are intermeshed and intertwined. The two railway companies, one publicly and the other privately owned, are in competition with the private and public telephone groups. This mixture of public and private ownership - all in competition - has served Canada well and may provide a prototype of what might work internationally as well.

The public and private sectors must adjust to vast and rapid changes in electronics. All our concepts, modern as they are, are becoming outmoded.... Do we still believe in Euclidian space - in a three-dimensional world? Or can space itself be bent or curved so that the axioms of Euclid are no longer valid? Space can be altered by the pull of gravitational fields, though this may be putting the cart before the horse, since these fields are the result and not the cause of curvatures in space. If we can shape or control the fields or forces in space, the science-fiction idea of "space-warps" may not be fantasy. If

PM SALUTES U THANT DECISION

When the Secretary-General of the United Nations, U Thant, had announced his decision to accept a further term of office, Prime Minister Pearson issued the following statement:

...On behalf of the Canadian Government, I wish to say how greatly pleased and heartened I am to receive this news. I should like to repeat on this occasion what the Secretary of State for External Affairs said in his statement to the General Assembly on September 23: "He (the Secretary-General) has said that no man is indispensable in the function which he himself is performing with such distinction. But, notwithstanding the difficulties to which he has called attention, the guidance which he has provided to our work, his sense of responsibility, his qualities of compassion and understanding and, above all, his capacity to speak and to act in the name of mankind, are indispensable to the United Nations."

I know, therefore, that I speak on behalf of all Canadians when I express my pleasure at U Thant's decision, reiterate our confidence in him and wish him well in the arduous task which he has agreed to undertake for a further term of office. The Canadian Government will do its utmost to assist him to maintain and promote the purposes and principles of the Charter which are and will remain the purposes and principles on which Canada bases her international relations.

CANADA'S DEPENDENCE ON EXPORTS

Mr. Robert H. Winters, Minister of Trade and Commerce, predicted recently that realization of his 1967 export goal of \$11.25 billion could create up to 160,000 new jobs in Canada.

Speaking to the tenth anniversary dinner meeting of the Industrial Management Club of South Waterloo in Galt, Ontario, Mr. Winters said that the new jobs would come into being only if the export increase represented greater productivity, rather than diversion from domestic requirements.

Describing the present trade picture, the Minister noted that exports had advanced 20 per cent this year over last, and that achievement of the expected level of \$10 billion for 1966 would establish a mark 70 percent greater than the total of five years ago. Canada's economic advance in recent years had been "virtually unprecedented", he said, and a major share of this success could be traced directly to merchandise exports.

Mr. Winters regarded the success as proof of the ability of Canadian producers to compete in international markets as never before. Further improvement in Canada's trade performance was essential he declared, and depended largely on exports of highly manufactured goods.

"Manufactures now count for a smaller share of Canadian exports and larger share of Canadian imports than in any other industrial country," said Mr. Winters. This situation existed despite the fact that exports of manufactured goods had grown faster

than industrial materials and primary products in the world trading community, he added.

The Minister emphasized the need to maintain a cost structure that would enable Canada to remain competitive if exports of sophisticated manufactures were to advance rapidly. He expressed concern over the inflationary tendencies and cost increases that were outstripping productivity gains by "an uncomfortably wide margin". "Should these tendencies persist, there could be a serious erosion in Canada's competitive position in international markets," he said.

SEARCH FOR SKILLED WORKERS

Mr. Winters suggested that improved productivity depended to a large extent on finding "the best possible ways of using our human resources".

Canada has been "remarkably successful" in attracting skilled workers from abroad, but "...it is unlikely that we will be able to rely as heavily on these sources in the future".

The need for qualified people had created "an explosion of learning," said Mr. Winters, that would more than double the numbers in Canadian universities by 1975. This would require vast spending programmes to expand the university plants.

The Bladen Commission report on financing higher education in Canada, the Minister said, had estimated conservatively that expenditures for universities ten years from now would be over \$2 billion.

Despite this enormous expansion, he said, only one out of 12 persons of university-age was at university in Canada, compared to six out of 12 in the United States.

EDUCATIONAL AID TO PROVINCES

The Minister described the federal proposal to assist provinces with education costs through a special arrangement of unconditional fiscal transfers calculated in relation to the operating costs for post-secondary education, but also urged greater financial participation by industry to insure "the freedom of our institutions...from all arbitrary influence, including government".

"Corporate business management has a long and distinguished history of rendering aid to higher education in this country. We may take satisfaction... that our expanded educational facilities will help to bring us closer to our ultimate objective...a rich fruitful life for all Canadians," he concluded.

NEW PATROL VESSEL

Mr. H.J. Robichaud, the Minister of Fisheries announced recently that a contract valued at \$2,798,468 for the construction of a multi-purpose patrol vessel for the Pacific coast had been awarded to Yarrow's Victoria, British Columbia.

The 180-foot craft, of welded steel construction, will be the largest and most versatile of the Department of Fisheries protection fleet on the Pacific coast. Besides performing regular patrol duties, it will be equipped for experimental fishing, research projects and search and rescue activities.

The vessel, which is designed for deep water navigation, will provide all-weather surveillance of offshore grounds where Canadian fishermen have been increasing their fishing. Among its primary responsibilities will be the enforcement of Canadian fisheries regulations and territorial limits.

The new patrol ship will have a cruising speed of 12 knots and a top speed of 15 knots. A cruising range of several thousand miles will permit without refueling, patrols to and from the Bering Sea.

Equipped with the most modern of navigational and electronics aids, the vessel will provide living and laboratory accommodations for scientists to conduct oceanographic and biological observations at sea. One feature of the design, an Alpine-Pleuger active rudder, will allow great maneuverability of the vessel, particularly for fishing operations and docking. Delivery of the new patrol craft is expected during 1968.

The hull design will be similar to that of two patrol vessels built for Atlantic coast patrol duties, the *Cape Freels* and the recently-launched *Chebucto*. On the Pacific coast, the Fisheries Department's Conservation and Protection Service operates 40 patrol vessels. The addition of this all-weather long-range vessel, which is due for delivery in mid-1968, will improve the efficiency of the fleet in guarding the valuable fisheries resources of Canada's Pacific coast waters.

* * * *

APPLES GALORE

According to the Ontario Hydro News, Canada's apple crop this year is about 20 million bushels, a quarter of which comes from Ontario. Eight hundred thousand bushels of Eastern Ontario's crop are grown in Northumberland County on the 2,500 acres of orchards that spread along the sandy loam stretching from Port Hope to Trenton.

Here, the complete apple industry is neatly packaged, from growing, grading and export to processing, from the benevolent assistance of the Ontario Department of Agriculture at Grighton to advanced orchard research and supplies of root stocks at the Dominion Experimental Farm at Smithfield.

The first Northumberland County orchard on record was set out east of Cobourg in 1804 by two New England brothers, Levi and Stoddard Bates. It was hardly a commercial orchard, nor were there any such for the next 60 years. Even then, most orchards were badly planted, unpruned and generally neglected two-acre plots.

In 1890, improved orchard practices put apples on a paying basis and, by 1910, the industry was firmly established because of high prices and a succession of good crops.

Northumberland County orchards have 190 days of growth, the shortest apple-growing season in Canada. It is also one of the driest regions, with 32.9 inches of rainfall. With a total of 2,500 acres, county orchards average 25 acres in size, although four or five orchards contain 150 acres and more.

NEW SPECIES

A new variety of apple called the Quinte has been developed at the Smithfield experimental farm. The Quinte known to horticulturists for 20 years as *T-441*, has been controlled by budding and grafting for winter hardiness, compatibility to average orchard soils, a maximum yield, early harvesting, good looks, hardy handling and a nutrient content to suit modern processing techniques.

The Quinte has been on the market since 1964, but apple men do not expect the housewife to fully appreciate its fine characteristics for 30 years. By that time, the Quinte may surpass the popular McIntosh in consumer demand. It could gain popularity much sooner, however, in a "puffed apple" cereal product now being tested at Smithfield.

* * * *

CANADA-ARGENTINA MOTORCADE

A motorcade from Canada and the United States to Buenos Aires, Argentina, is being planned by the Pan-American Highway Association of Belleville, Kansas. In a letter to the Secretariat of the Pan-American Highway Congresses of the Organization of American States (OAS) John C. Dart, tour chairman of the Association, announced that the trip would begin at the headquarters of the organization on January 25, 1967, and end on March 5 in the Argentine capital. Canadian members of the convoy are expected to start from Winnipeg, Manitoba, two days earlier.

The tour chairman is trying to draft for the motorcade at least one car from each city and town along the U.S. leg of the Pan-American Highway. Those making the trip, may start from any point in the U.S. and Canada, and drop out anywhere beyond Mexico City.

* * * *

FOREST FIRES

According to estimates of the Department of Forestry and Rural Development, 619 fires burned 31,000 acres across Canada in September. The bulk of the damage occurred however, in the Yukon and Northwest Territories, where 26,000 acres were damaged by 17 fires.

Last year's September figures were slightly higher, with 40,000 acres damaged by 315 fires across Canada, but only 1,000 acres were affected in the Yukon and Northwest Territories by 19 fires.

The September figure brings the estimated damage for the season to the end of the month to 686,000 acres burned by 6,705 fires. The Yukon and Northwest Territories accounted for 496,000 acres damaged by 348 fires. Last year's estimates for this same period were somewhat lower for all Canada - 523,000 acres burned by 6,954 fires, but the figures for the northlands show a sharp difference with 190 fires affecting only 29,000 acres for the season ending September 30, 1965.

(Continued on P. 5)

For August 1966, the Department of Forestry and Rural Development estimated that some 1,275 fires damaged 300,000 acres.

BARBADOS INDEPENDENCE

Canada was officially represented at the ceremonies marking the independence of Barbados on November 30 by Mr. J.W. Pickersgill, Minister of Transport and Mr. J.R. McKinney, Canadian High Commissioner to Trinidad and Tobago.

In addition, two ships of the Royal Canadian Navy, HMCS *Gatineau* and HMCS *St. Laurent* visited Barbados during the independence celebrations.

On his return from Barbados Mr. Pickersgill stayed overnight on December 1 in Santo Domingo, at the invitation of President Balaguer of the Dominican Republic.

WORLD WITHOUT DISTANCE

(Continued from P. 2)

we can curve space — fold it in this way — we may in our lifetime be able to step from one continent to another as easily as we now move from one room to another.

FUTURE FORECAST

...The time will come soon when we shall be able to call anyone anywhere on earth by merely dialing a number. Each of us will have a number. We shall automatically be located whether we are in mid-ocean, in the heart of a great city, or crossing the Sahara. This instrument alone may change the patterns of society and commerce as greatly as the telephone, its primitive ancestor, did over the past half century. The perils are obvious: think of the invasions to privacy. No invention can be completely beneficial. Yet think of the countless lives it would save, the tragedies and heartbreaks it would avert. Remember what the telephone has meant to lonely people everywhere. No one need ever be lost again because a simple position and direction-finding device can be incorporated into the receiver, using today's radar navigational aids. In the event of danger or accident, help could be summoned merely by pressing a button....

As communications improve, the need for transportation will decrease. Our grandchildren will scarcely believe that millions of people once spent literally hours of every day fighting their way into city offices, where, as often as not, they did nothing that could not be achieved over telecommunications links. Soon, global phone and vision services will enable executives to confer with each other anywhere on the planet. We are only at the beginning. Today we have data-handling systems capable of controlling nation-wide industrial empires from one spot. Electronics is already permitting the decentralization which rising rents and overhead costs encourage more strongly every year.

The business of the future may be run by executives who are scarcely ever in each other's physical presence. The head office may be merely the equivalent of a telephone number with its files and records in space rented in memory units of computers which could be located anywhere on earth. The information stored in them could be read off on high-speed printers where, whenever any of the firm's offices needed it, it would be instantly available. The time may come when half the world's business may be transacted through vast memory banks, be it the barrens of our Northwest Territories, the tundra of Siberia, or the inner reaches of Labrador, or wherever land is cheap and useless for any other purpose. Any point on earth will be accessible to the beams of relay satellites. A sweep from pole to pole would merely mean turning antennae through 17 degrees....

SKY THE LIMIT

Another use of space and satellites might be the orbital post office. This would render airmail obsolete. Modern facsimile systems can automatically transmit and reproduce the equivalent of an entire book in less than a minute. By using these techniques, a single satellite could handle a whole day's transatlantic correspondence. Tomorrow we might purchase a standard letter form, write or type the message which would then be fed into a machine, which scans the marks on the paper, converts them into electrical signals and transmits them to the appropriate place around the earth, to a machine which picks them up and reproduces them on a blank identical form. All this would take a fraction of a second. Door-to-door delivery might prolong the necessary time to several hours, but eventually letters need never take more than a day between any two points on the globe.

Perhaps, beyond the next decade, there may be something more startling — the orbital newspaper. Made possible by modern reproducing and facsimile machines, these could work by means of television sets which will be able, on demand, to make a permanent record of the picture flashed on the screen. When you want your daily newspaper, you will switch to the appropriate channel, press the right button and collect the latest edition as it emerges from the slot....

Nor will that limit the possibilities. Over the same circuits we will be able to conjure up from central memory banks or information centres, copies of any document we desire from the Magna Carta to the current earth-moon passenger schedules....

Personal radios, translating machines, global libraries, telesensory devices, logical languages, mechanical educators, robots, memory machines — these are all conceivable in the not-too-distant future....

NEW INTERNATIONAL DIMENSIONS

Our international problems and relations will assume new dimensions in an era of limitless freedom of communication. Our Canadian concern for economic independence may pale when the whole world becomes what Marshall McLuhan has called a global village. Global communications will be a revolu-

tionary force capable of transforming our civilization. Let's look at one of the consequences.

In the near future every large nation will be able to beam, either by direct broadcast or relay, high quality programmes to the entire planet. There will be no shortage of wavelengths as there is today for local services. One of the advantages of the satellite relays is that they will make available vast new bands of radio spectrum providing "ether space" of at least a million simultaneous television channels or a billion radio circuits. This will mean the end of all distance barriers to sound and vision alike. Montrealers will be able to tune in on Peking. New Yorkers will be able to see live programming from London.

MIRROR OF THE WORLD

What are the implications of this feat? When the great highway of ether is thrown open to the whole world, all men will become neighbours - whether they like it or not. Censorship, political or otherwise, will be virtually impossible. To jam signals coming down from the heavens is almost as difficult as blocking light from the stars. The Russians would be able to do nothing to stop their people from seeing the American way of life and the Chinese will be able to look across the straits to their cousins. Language will be no barrier - computers will automatically and

simultaneously translate from one language to another.

There are dangers as well. By 1970, the U.S.S.R. can establish the first high-powered satellite television relay from above Asia, broadcasting in several languages so that more than a billion human beings can understand the programmes. Billions who have never learned to read, have never seen a movie, and who have no rival distractions could fall helpless under this hypnotic spell. The whole thesis of nationalism and patriotism must be re-examined in the light of these startling and astonishing developments.

When I try to envisage what lies ahead, I sense that our generation represents only a very early stage in the total story of evolution. It is our job today to ensure that our brief stay on this planet will not be criticized by those who follow us because we failed to meet the challenge. We must begin now a meaningful communication amongst ourselves. Our descendants, less cluttered up with material possessions, may remember and concentrate on many of the things we have forgotten: perhaps the only things in the world that are everlasting, the imponderables of beauty, of wisdom, of laughter and of love.

Those who look to the future as I do, with hope and anticipation, want Canada to realize her own potential. We yearn for improvement in the quality of our national life. We want a rewarding co-tenancy of this continent with our American neighbours....

FUTURE FORECAST
...The time will come when we shall be able to...
Each of us will have a number. We shall be...
This instrument alone may change the patterns of...
primitive ancestor, did over the past half century. The...
paths are obvious; think of the invasions to privacy...
of the countless lives it would save. Remember what the...
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