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CANADA IN THE SPACE AGE

Notes of a speech by Mr. J.G. Diefenbaker, the Prime Minister of Canada, at the Royal Military College, Kingston, Ontario, on May 15, 1959.

The world stands on the threshold of the space age. It is proper that one should ask today: "Where does Canada stand in the quest for knowledge of the uncharted wonders that lie beyond?" "What are Canada's potentialities?". "What can Canada achieve in collaboration with others?" "What practical benefits can accrue to Canadians and to mankind as these new regions and scientific knowledge are explored"? These are questions about which it is possible to speak, if not with certainty, at least on the basis of evidence which is accumulating every day.

It seems appropriate that on this occasion I share with you some thoughts and speculations about the future, with special attention to the realm of outer space and the ways in which it may be utilized for the betterment of man. As students at a military college, you have undoubtedly been aware of the new and exciting developments in science which have taken place in recent years. Your training and your curriculum have been adapted to meet the changes brought about by the march of science and engineering. It is the hope of your instructors that your minds have also been adapted to meet the changes which are being brought about by the almost incredible technological developments of the world in which we live.

On another occasion over a year ago, I stated that the exploration of space, whether by manned or unmanned instruments, has military potentialities as well as civilian benefits. the promotion and establishment of the rule of law now is necessary and outer space should belong to the world as a whole. Jurisdiction should be vested in the United Nations to assure that it will be used for scientific and peaceful purposes only. All nations, great or small, should have equal territorial rights, and the launching of all space missiles should be preceded by notification that the benefits accruing will be available to all mankind.

On May 6, the community of nations took another step forward into the space age. On that date there was convened at United Nations Headquarters in New York the Ad Hoc Committee on the Peaceful Uses of Outer Space. This Committee, of which Canada has been appointed a member, was established by the United Nations as the means for planning international co-operation in research in the space sciences and the exploration of space.

Manifestly the rewards of genuine international co-operation will be great. It is no less clear that the penalties of international rivalry will be grave.

In the absence of the Soviet Union from the United Nations conference table, I express also the Government's profound hope that the Soviet Union will at a later date enter into discussions on this matter within the United Nations. Apart perhaps from disarmament, there is no field in which universal co-operation of the major industrial nations is so important.

Canada, as a member of the United Nations Committee, will put forth every endeavour to ensure that a suitable basis for future international co-operation is developed.

Canada's Contribution

Because of Canada's geographical relationship to the magnetic pole, there are conditions of special interest in the upper atmosphere over this country which have been the subject of active research for many years. Canada can make a significant contribution. For the past 12 years there has been a major Canadian programme investigating the ionosphere, the aurora, meteors, cosmic and solar radiations and the geomagnetic fields.

Since the development of high altitude rockets and artificial earth satellites, the governmental scientific agencies have initiated an expanded programme of instrumentation and research. Canadian scientists have assisted in tracking satellites and have supplied information on their trajectories to the Soviet Union, as well as to the United States. A group of chemists at McGill University have co-operated with United States' scientists in sending chemical materials up in rockets to investigate the composition of the upper atmosphere. To facilitate the tracking of high altitude vehicles at extreme ranges, a very powerful radar is being installed in Saskatchewan.

During the International Geophysical Year, which ran from mid-1957 to the end of 1958, Canada was host to the United States IGY rocket programme at Fort Churchill. Various Canadian agencies assisted the United States rocket team. As part of

the programme, two rockets carrying instruments prepared by the Canadian Armaments Research and Development Establishment were fired in November 1958.

Plans exist to fire during the present year additional United States rockets with instruments provided by Canadian agencies.

Meantime, a high altitude rocket of Canadian design is under development and it is likely to be a highly efficient research instrument. Further in the future in planning is the instrumentation of a satellite by Canadian agencies for experiments conceived by Canadian scientists, and preliminary arrangements have been made with the United States National Aeronautical and Space Administration to launch such a Canadian satellite in 1961.

Earlier this week, Prime Minister Macmillan sketched some of the intentions of the United Kingdom in the satellite field and referred to the possibility of joint action within the Commonwealth. So far as the Canadian Government is concerned, we should be glad to undertake the consultations on this question which Prime Minister Macmillan has proposed.

I have dwelt upon the activities of Canadian scientists, both in governmental agencies and in universities, at some length because it is not always recognized that we have in Canada the scientific knowledge, the facilities and the experience to participate in the exploration of space. A few years ago some of the recent experiments could not even be contemplated -- much less those which now are becoming possible. I believe that Canada should maintain its status as a scientifically advanced nation and continue a sound programme of research into the phenomena of outer space.

Space Research Committee

In this connection I wish to announce that the President of the National Research Council and the Chairman of the Defence Research Board are in process of establishing a Permanent Joint Committee on Space Research, on which other governmental agencies concerned with these matters and a number of interested universities will have representatives. One of the purposes of the Committee will be to ensure that university research teams have the opportunity to work in this field.

Science is increasingly becoming an important concern of governments. Some programmes, such as comprehensive atomic energy programmes, are too costly for university and industrial laboratories alone. As well, the dynamic interaction of science and technology requires governments to have sound scientific

advice so that they may plan wisely for future economic and industrial development. I have little doubt that the investment Canada has made in its atomic energy programme will be repaid many times over in the next few years. The returns on investments in space research are less easy to forecast.

These programmes are fantastically costly, and the annual expenditures in the United States on scientific research, technological development, instruments, guidance and tracking systems, fuels and a host of other intricate and specialized items of the space cost in the billions of dollars.

Benefits from Satellites

What are the potentially assured results? Perhaps the first practical benefit will be a great improvement in our knowledge of weather and the techniques of forecasting. There are indications that a fairly modest system of meteorological satellites would provide increased warning of major storms, which could annually diminish property damage by millions.

There are possibilities in the field of navigation also, especially all-weather navigation. Satellites may in time help to ease the growing problem of traffic in communications. We may even hope that by the use of space satellites, a solution may be found to the problems of international inspection under a disarmament agreement.

The scientists of the world are probing further into the secrets of nature. The engineers have provided them with the tools which enable studies of the cosmos to be made, which only a few years ago could have been no more than a dream. Not only will it shortly be possible to view the universe without the distortions caused by the earth's atmosphere; it already is possible to study the fundamental particles of the cosmic and solar radiations before they are affected by our atmosphere.

He would be a bold man who would venture to forecast which might be the practical applications of the extensions of fundamental knowledge which research into space is bringing. One thing, however, can be said and that is that interest in the phenomena of space is universal. It is unthinkable that knowledge of the cosmos should be concealed or exploited for narrow nationalistic reasons. We must strive, therefore, for the development of effective co-operation between governments and nations in the exploration of space. We have before us the inspiring tradition of the scientific fraternity which has consistently recognized that co-operation between the scientists of different nations is an imperative necessity.

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