

# The Canadian Atomic Energy Control Board

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**M**OST Canadians have read in the press about the work and problems of the United States Atomic Energy Commission but some may not be aware that there is in this country a similar organization. Canada's Atomic Energy Control Board, established by the Atomic Energy Control Act, 1946, was given wide powers to control and supervise the development, application and use of atomic energy in Canada and to enable this country to participate effectively in any future measures of international control.

The Board is an agency of government and receives funds for its operations by vote of Parliament. It reports to Parliament, not through an individual

minister, but through the Committee of the Privy Council on Scientific and Industrial Research, a committee composed at present of the Ministers of Trade and Commerce, Agriculture, National Defence, Mines and Resources, and Reconstruction and Supply.

## Organization

The Board is composed of the President of the National Research Council, who is a member *ex officio*, and four other members appointed by the Government. At the present time the members are:

Dr. C. J. Mackenzie, President of the National Research Council and President of the Board,

The President of the National Research Council has described the Atomic Energy Project at Chalk River, Ontario, as "the most heart-warming" of Canadian scientific achievements since 1939.

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Mr. G. C. Bateman, Mining Consultant, Montreal, P. Q.

Dr. Paul E. Gangon, Director of the Department of Chemistry and Chemical Engineering, and Director of the Graduate School, Laval University,

Mr. V. W. T. Scully, Deputy Minister (Taxation), Department of National Revenue,

Mr. W. J. Bennett, President and Managing Director, Eldorado Mining and Refining (1944) Limited.

To assist in carrying out its duties, the Board has employed a small professional and clerical staff, headed by Dr. W. R. Sawyer, Assistant to the President and Scientific Adviser, and Mr. G. M. Jarvis, Legal Adviser and Secretary. This staff, however, has been kept to a minimum for the Board felt that wherever possible it should make use of existing facilities in other Government organizations rather than set up duplicate facilities in its own organization.

### Duties

Though the duties and responsibilities of the Board as outlined in The Atomic Energy Control Act cover a very wide field, it is convenient in a short article like this to consider these duties under the following headings;

- (1) Furtherance of Research,
- (2) Development of Natural Resources,
- (3) Control of Material and Information,
- (4) Liaison with other Organizations.

#### 1. *Furtherance of Research*

Shortly after its formation the Board was made responsible for the control and administration of the plutonium production plant which had been started at Chalk River during the war. In order that large scale research on the production and application of atomic energy might be carried on in Canada, the Board decided that this plant should be completed and maintained as a research establishment and it requested

the National Research Council to operate the plant on its behalf.

Much has already been written about the work at Chalk River. It is sufficient here to point out that Canada has at this establishment an able scientific staff which is taking a leading part in the development of this new field of science and an atomic energy pile recently described by the Director of Reactor Development of the United States Atomic Energy Commission as having the most advanced design and performance of presently known research reactors.

In addition to furthering large-scale research at Chalk River, the Board has also encouraged Canadian universities to continue fundamental research in nuclear physics and its application in the fields of chemistry and medicine by making available financial grants for the purchase of special equipment and by authorizing the distribution of radioactive isotopes for research purposes. Moreover, as announced by the Right Honorable C. D. Howe in December 1948, the Board has offered certain isotopes free of charge during 1949 to Canadian industrial concerns wishing to use these in their development work.

#### 2. *Development of Natural Resources.*

An important duty of the Board is the supervision of the development of Canadian ore uranium deposits to meet the requirements of the atomic energy program. For instance, when the technical problems now standing in the way of large-scale industrial applications of atomic energy have been solved, it is expected that the peace-time atomic energy industry will require large supplies of uranium. It should not be forgotten, moreover, that Canadian uranium played an important part in the development of atomic energy for military purposes and it would be folly to ignore the possibility that it may be required again for such purposes in the event of hostilities.

It has been decided that, with proper security provisions, the development of

Canadian uranium deposits need not be carried out solely by the Government and accordingly, private prospectors and companies have been encouraged to prospect for and develop such deposits. On the advice of the Board, the Government in 1948 offered to purchase through Eldorado Mining and Refining (1944) Limited, acceptable uranium ores or concentrates of specified grade and guaranteed a minimum price for these materials until March 31, 1955. As a result of this offer, there has been great activity in prospecting and exploration for uranium over large areas in Canada.

The Department of Mines and Resources has cooperated wholeheartedly in this undertaking. Not only has it published a free booklet on the methods of prospecting for uranium, but it also makes radioactivity tests on samples sent in by prospectors and gives advice on the best methods of concentrating ores.

### 3. *Control of Material and Information.*

Another important duty of the Board is the control of materials and information of vital importance in the development and application of atomic energy.

For reasons of national security, it is of the utmost importance that supplies of certain radioactive materials do not fall into improper hands. Moreover, the possession and use of radioactive materials by persons unskilled in the handling of such materials may create serious health hazards. Consequently the Board has issued regulations, known as "The Atomic Energy Regulations of Canada", to control all dealings in such materials. The export and import of radioactive materials and equipment of special importance in atomic energy work are controlled under arrangements made by the Board with the Departments of Trade and Commerce and National Revenue.

National Research Council workers at the Chalk River atomic energy plant conducting experiments in remote control extraction of fission product.

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For similar reasons of national security, the Board has restricted the publication of information in certain fields of atomic energy which might be of value to a potential enemy. These restrictions are similar to those in effect in the United Kingdom and United States with whom Canada cooperated in the wartime development of atomic energy.

#### 4. *Liaison with Other Organizations.*

It is of course the duty of any organization to maintain effective contact with other organizations concerned in its work. Consequently, since the Board is responsible, through the Government, to Parliament for the Canadian atomic energy program, the question of liaison with Parliament is of importance. The Atomic Energy Control Act sets out that the Board's contact with Parliament shall be through the Committee of the Privy Council on Scientific and Industrial Research. Some Members of Parliament have suggested that a closer contact was desirable and at last Session the Right Honorable C. D. Howe indicated the Government's willingness to establish a parliamentary atomic energy committee so that Members might become better acquainted with the Canadian atomic energy program. The early dissolution of Parliament, however, prevented any steps being taken towards the formation of such a committee at the last Session.

As might be expected, the Board's relations with the National Research Council, the Department of Mines and Resources and Eldorado Mining and Refining (1944) Limited are particularly close, since these organizations are cooperating with the Board in the Canadian atomic energy programme. Liaison is also maintained, however, with other Federal Departments interested in the field of atomic energy and with the Provincial Mines Departments in connection with development of uranium ore deposits.

Close liaison is also maintained with the Atomic Energy Projects of the Uni-

ted Kingdom and the United States, the two countries with which Canada cooperated in the wartime development. In the case of the United States, complete interchange of atomic energy information is precluded by the terms of the American Atomic Energy Act but the three Projects do exchange information in the fields of raw materials supply, health and safety techniques, research with low power reactors and research with stable and radioactive isotopes.

Last, but not least, there is the question of liaison with the general public. This is, of course, very much hampered by the necessity of safe-guarding information in certain fields of atomic energy in the interests of national security but the Board is constantly trying to improve the situation. Though it has not been possible to date to permit visits to the Chalk River establishment by press and public, several short films on the work at Chalk River have been released through the cooperation of the National Film Board. Scientific members of the Atomic Energy Project have also cooperated whole-heartedly in this liaison. Not only have they published many excellent articles in scientific journals but they have also lectured to various groups and given radio addresses on atomic energy topics. The continuation and extension of these efforts of liaison are of great importance if the public is to be made aware of the possibilities of this new field of science.

#### **International Control**

One of the purposes of Parliament in setting up the Atomic Energy Control Board was to enable this country to participate effectively in any measure of international control which might be agreed to in the future. Consequently a few words on such control might not be amiss in this article.

Proposals for the international control of atomic energy have been under discussion in the United Nations Atomic Energy Commission since 1946. The



Canadian delegation headed by General A. G. L. McNaughton, a former member and President of the Board, has worked tirelessly for agreement on a system of control which would give the nations of the world some measure of security against atomic attack. Because of the present bitterness between East and West,

however, progress towards agreement has been disappointingly slow. Nevertheless, the achievement of an effective agreement will not only be a great contribution to peace but will also make it possible for the peoples of the world to share in the benefits to be derived from the peaceful uses of atomic energy.

## Fisheries Education in Canada

WILLIAM S. HOAR

**S**CHOOLS of Agriculture, Forestry, and Mining are well established in Canada, but there is only one Canadian institution — Laval University — which boasts a School of Fisheries. And there are few institutions which emphasize instructional work in Fisheries Biology.

This situation exists because of certain basic differences between ownership of land and water resources. The resources of the land are evident. Man can see what he owns, its extent and the manner in which his activities affect it. The resources of the ocean, on the other hand, are hidden in a medium which is foreign to man and covers a vast area of more than two-thirds of this planet. Further, man has developed certain legal rights with respect to land resources. He can acquire jurisdiction and control over definite areas. In contrast, the waters are national and international assets and their development is dependent upon political interest and international co-operation. Fish, moreover, move freely from one man-made area to another without respect for national interests.

### Difficulties of Marine Research

The scientist, too, has a more baffling problem than the land. Marine research, in particular, is expensive. Large vessels and rather complex gear are necessary for oceanographic work. For many years, botanists

and zoologists were forced to confine their activities to the sea shores and sheltered bays. It was only when they had accumulated a sufficient body of knowledge in this way that interest could be aroused to obtain the public support necessary for large scale marine research.

It is perhaps not surprising that the first important contribution should be made by the great fishing nations of Northwest Europe. The initial step in the wider field of marine research was taken in 1872 when the British corvette *Challenger* sailed on her scientific cruise. The Challenger Expedition lasted for four years and made extensive physical and biological surveys over 68,900 nautical miles of Atlantic and Pacific oceans. The results, published in fifty volumes of reports, opened an entirely new field to the scientists and aroused a general interest in oceanographic investigation.

To these scientists of the mid-nineteenth century, the resources of the sea seemed inexhaustible. In fact, a Royal Commission, investigating fisheries in Great Britain, concluded that "there is not a particle of evidence that anything man does has an appreciable influence on the stock of herrings." However, this opinion did not prevail for long. It is difficult to say now whether a real depletion of certain fish occurred or whether men simply became afraid of the fate of stocks they were attacking so