ERNMENT
CANADA

STATEMENTS AND SPEECHES

INFORMATION DIVISION
DEPARTMENT OF EXTERNAL AFFAIRS
OTTAWA - CANADA

No. 54/50 INTERNATIONAL CO-OPERATION IN DEVELOPING THE PEACEFUL USES OF ATOMIC ENERGY

Statement delivered on November 5, 1954, by the Minister of National Health and Welfare and Vice-Chairman of the Canadian Delegation to ninth session of the United Nations General Assembly, Mr. Paul Martin.

In Plenary session yesterday afternoon, the General Assembly unanimously adopted a resolution on disarmament. We turn now to what is, in a sense, the other half of the coin. The object of comprehensive, controlled disarmament is to eliminate war and the risk of atomic energy being used for destructive purposes. Until last December it was assumed that international co-operation in the development of peaceful uses must follow rather than precede disarmament.

Now, although we may be making headway on some aspects of the disarmament problem our differences are still far from resolved. In the course of the debate on the present item we shall all have an opportunity of examining the proposition that the time has come, without waiting for agreement on all aspects of a comprehensive disarmament programme, to move forward towards fuller international co-operation, through the United Nations, in developing the positive benefits for all mankind which our knowledge of the atom even now makes possible, to say nothing of the vast promise of the future.

It is a great satisfaction to my Delegation -- and I am sure to all of us, Mr. Chairman -- that this effort is being discussed in the United Nations and that the aim of the sponsoring powers is to set up an agency closely related to the United Nations. I shall have more to say on this point later in my statement, but let me reiterate here that this is one field in which the United Nations should not, and I am confident will not, be by-passed. The potentialities of the controlled release of atomic energy to serve man's welfare are so enormous that their development cannot but be regarded, by all who are equipped to contribute to this great enterprise, as a sacred trust. The United Nations is an obvious and indeed unique repository for this trust.

Since the turn of the century when the discovery of radio-activity first gave to scientists some indication of the vast amounts of energy that were latent in the atom, international co-operation has been, I would say, the outstanding characteristic of nuclear physics. Becquerel in France, Einstein in Switzerland, Neils Bohr in Denmark, Otto Hahn in Germany, Fermi in Italy, Rutherford in England and earlier in Canada - these and many others are the men who made the fundamental discoveries that culminated eventually in the dramatic demonstration of the power of the atom. Looking back over the history of these developments one cannot but be impressed by the fact that without international co-operation these achievements would have been impossible. The efforts of the post-war years to achieve, through the United Nations, a solid basis of truly international co-operation in developing the peaceful uses of atomic energy have, as I see it, been aimed at re-establishing, over as broad a field as possible consistent with elementary prudence, the co-operation which the international scientific community in happier days used to take for granted.

The three governments which had co-operated during the war in the race to develop atomic weapons for the free world were quick to urge that the new force be brought under international control and developed for peaceful purposes. The declaration of November 15, 1945, by President Truman, Mr. Atlee and Mr. Mackenzie King stated that the three countries were "prepared to share, on a reciprocal basis with others of the United Nations, detailed information concerning the practical industrial application of atomic energy just as soon as effective enforceable safeguards against its use for destructive purposes can be devised."

Two months later, on January 24, 1946, the General Assembly adopted unanimously its first resolution establishing an atomic energy commission which was in particular charged with making "specific proposals for extending between all nations the exchange of basic scientific information for peaceful ends."

During the years that followed, our hopes of securing international co-operation gradually diminished as disagreement on the prerequisite disarmament scheme hardened into deadlock.

Meanwhile the scientists of a number of countries, working for the most part without the benefits of a full interchange of information, were nevertheless succeeding in opening up new horizons for peaceful uses. However, although much of the basic information gradually became available, the tools of atomic research and development were still prohibitively expensive and the necessary materials were not everywhere available.

It was at this point, last December 8, that the President of the United States made his

historic and generous proposal before this Assembly -- a proposal which the Canadian Government immediately welcomed most heartily. It was the kind of imaginative and magnanimous initiative on a big scale which the United States Government and people have from time to time shown themselves capable of taking at opportune moments. As friends and neighbours, Canadians have long known that the United States is dedicated to peace, and that the true portrait of her motives and actions bears no resemblance to the shop-worn caricature. The President's initiative now being followed up bears this out.

As my United States and United Kingdom colleagues have already reported, the President's offer last December was followed by months of negotiations between the United States and the U.S.S.R. The diplomatic exchanges between these two governments have now been published and have been circulated to us. There is no need for me to dwell on the disappointment which the Canadian Government felt as we followed the negligible progress of these negotiations. The Government of the U.S.S.R. were, at least until comparatively recently, insisting upon the unconditional prohibition of the use of atomic weapons as a prior condition to any substantive negotiations on the setting up of an international agency which might, in spite of the continuing disagreement on disarmament, promote international co-operation in the development of peaceful uses.

I should like to make it unmistakably clear that my Government still hopes that the Government of the Soviet Union will decide to take part in the proposed atomic energy agency. We are encouraged in this hope by the fact that the Soviet Union has apparently dropped its insistence on the unconditional prohibition of atomic weapons as a procondition for negotiations both on disarmament and on an atomic energy agency. Moreover, the Soviet Representative was careful to have it recorded in the General Committee, when the agenda was being discussed, that the recommendation to inscribe the present item on our agenda had been taken unanimously. The Soviet Union's note of September 22, although none too clear on this point, also gives us some ground for believing their position may have been revised. We hope in the course of this debate that the Soviet Representative will clarify his Government's present stand.

I am glad, however, that the statements of my United States and United Kingdom colleagues could have left Mr. Vyshinsky no doubt that the door is still wide open for the Soviet Union to participate in the agency, and to participate if they so desire, not only in the operation but in the organization and establishment of the agency.

In the exchanges between the U.S.S.R. and the United States, the Soviet Government have reverted time and again to the objection that

President Eisenhower's proposed agency would not deal with the disarmament problem, that his proposal was in fact not a disarmament proposal. This point has never been in dispute. As was made clear last December and many times since by United States' spokesmen, and again today by Ambassador Lodge, the President's proposal was, as I understood it, never conceived as a disarmament proposal. It was intended, as he said, to get international co-operation started in the field of peaceful uses without waiting any longer for agreement to be reached on a comprehensive disarmament programme.

International co-operation in this field without the Soviet Union would be a second best solution. But I do not see how the Soviet Union or anyone else can expect those of us who are now ready to co-operate internationally under the aegis of the United Nations to delay doing so indefinitely. A genuine attempt to secure Soviet participation has been made for the past nine months, so far without success. Does anyone seriously suggest that we must wait for the months to become years in the hope that the Soviet Union will change its mind? Is international co-operation in this field of such great promise to be delayed indefinitely? Surely that is not the wish of this Assembly. I urgently express the hope, having in mind the constructive activities of the representative of the U.S.S.R. in this Assembly, that he will find it possible to bring about clarifications in this matter which civilization demands.

Mr. Lodge and Sir Pierson Dixon have explained in some detail the type of agency we now hope to negotiate, if necessary without Soviet participation - but preferably with the full co-operation from the outset of the Soviet Union. I think it should now be clear that no attempt is being made to set up any kind of exclusive organization. As my two colleagues have stressed, we seek to set up an Agency in which all States will participate as members. If we had wanted to be exclusive, we would not have brought this subject to the United Nations, certainly not at this very early stage in the negotiations of the agency. We would not have proposed that the agency should be closely related to the U.N. - indeed, as much a part of the United Nations as are the Specialized Agencies. We would not have sought Soviet participation in the beginning and left the door open even after initial delays and discouragements. We could perfectly well have gone off into a corner and made our own arrangements privately for the most rapid exploitation of atomic resources we could jointly devise for our own benefit and I think it is to the great credit of the United States that this initiative has been taken. Indeed, from the rather narrow point of view of national interests, there would have been many attractions for some countries in doing that very thing. Those who suspect our motives might ask themselves why we did not, as a group, decide to continue the various forms of co-operation which have in the past few years been worked out directly among the eight countries at present negotiating.

Now, having tried to explain how and why we are proposing to negotiate for the establishment of an International Atomic Energy Agency, I should like to say a few words to supplement what my United States and United Kingdom colleagues have already told us about the nature and functions of the Agency which we hope will be set up.

It seems to my Government that the most immediate need is for information and training to spread the technology required for the application of atomic energy for peaceful purposes on a wide scale. In the present state of the science, it would be visionary to imagine that if by this time next year the International Agency has been set up it would shortly thereafter be in a position to start exporting power reactors to various parts of the world. The first economically practicable reactor has, so far as we know, yet to be built. In fact, although we may be across the threshold of the atomic age, as Mr. Lodge said, we are not yet beyond the anteroom of the age of atomic power. I say this as plainly as I can to prevent possible misconceptions being followed by a certain disillusionment.

My Government does hope, however, that the Agency, when established, would assist other countries participating in the Agency's programme to set up their own research reactors and to join with those countries already possessing them in pressing forward with the search for developing atomic power on an economic basis and with the whole range of other actual and potential applications of atomic energy for peaceful purposes. In order to construct reactors and carry on useful creative research in this field, it is necessary not only to have the technical information on the subject, - much of it, as I have said, already available - but one must also have scientists, engineers and technicians trained at least to some degree in the use and interpretation of these extremely complicated research tools. For this reason we believe that the Agency should foster not only the inter-change of information on peaceful uses but should facilitate where possible the arrangements which will have to be made for those countries who wish to set up research reactors to have their people suitably trained. The Agency should in fact encourage world-wide research and development and should in fact encourage world-wide research and development and should in addition be in a position to arrange for the nuclear materials which will be needed for this purpose. In this connection, I may say that Canada would be a potential source not only of information but of raw material and fissile material.

Our aim, in short, is to see established a specialized agency of the United Nations which would initially promote the various objectives I have enumerated, which would help to meet the first requirement of more information and more training in this field, and which would facilitate countries participating to set up their own research reactors. I do not see how I can say very much more at the present very early stage of negotiations.

As the members of this Committee know, the United States, United Kingdom, France, Belgium, Australia, South Africa, Portugal and Canada are taking part in these negotiations -- one might more accurately speak at the present time of "consultations", for they have only just begun. No doubt some of the members not at present included in the negotiations or consultations may feel that they have a legitimate claim to take part in the agency from the outset. However, I think it will be generally conceded, that with the exception of the U.S.S.R. -- to whom the door is always open -- there are no countries who could claim, on the basis of their atomic research and development and of their resources of fissionable material, that they have a better claim to be in on the first round than any of the present eight. As has been explained by the speakers who have preceded me, it is our hope and intention that as soon as there is a substantial degree of agreement among the eight governments now negotiating, the circle of consultations should be broadened. At a still later stage, when the agency is established, it should negotiate an appropriate form of agreement with the United Nations, similar to those of the Specialized Agencies. This would be done in accordance with Articles 57 and 63 of the Charter. At that stage there would, therefore, be an opportunity for all states, which have not previously been consulted in one form or another, to express their views before the new specialized agency of the United Nations was finally constituted and its working relationships with other United Nations organs defined.

In any series of negotiations, one must start somewhere. I doubt whether any of the Specialized Agencies came into existence as a result of <u>initial</u> negotiations involving 60 or more countries. In most cases the plans for the agencies were worked out by a smaller group of the countries principally involved and, after adjustments to take into account the views of other countries which had not been consulted initially, the agency's relationship with the United Nations was negotiated and confirmed. There is therefore nothing unusual in the present procedure except perhaps in the fact that, in view of the very great importance of the subject matter of the proposed agency, the organizing group of states is coming to the Assembly at an unusually early stage in the negotiations.

In the normal course there is bound to be a considerable gap in time between the formulation of new scientific theories and their practical application to our everyday life. In the development of atomic energy, the exigencies of war and the great concentration of the scientific knowledge of a number of countries, together with the devotion of enormous sums of money, made possible a phenomenal speeding up of the normal progression between theory and application. The application of atomic energy to peaceful purposes has also been vastly facilitated by the research and development of a few countries. It would be tragic if these countries - or any one

of them - were to decide to go its own way, to keep its knowledge solely for the benefit of its own peoples, and to refuse to co-operate for the general welfare of all peoples.

Every government looks at a major question of policy from the point of view of its own experience. If I may, without disgressing too far from the immediate business in hand, I should like to explain why, from our own experience, the Canadian Government supports the present move towards international co-operation.

Canadian experience shows what can be achieved through such forms of co-operation open to us by a country of modest resources and attainments. There are few countries in the world that have the scientific, technological and financial resources to break their way into the atomic age unaided. The United States, for example, has spent more than 12 billion dollars for the development of atomic energy. The Canadian programme owes much to the invaluable assistance we have received from the United States, as well as the United Kingdom, during and since the war. Now that so much of the basic research and development work has been done by the pioneering countries, there is no point in others going over the same ground, conducting the same experiments, engineering the same development, in order to arrive several years hence at the practical benefits which are already attainable through international co-operation.

Since the Second World War, the efforts of Canadian scientists have been devoted almost exclusively to the peaceful application of atomic energy, and in particular to the problems of power development.

Thanks very largely to the complete pooling of the Canadian and United Kingdom atomic projects during the latter part of the war, Canadian scientists found themselves, by the time the war in the Pacific ended in the fortunate position of having in operation the only atomic reactor anywhere outside the United States. Building on the experience gained from this small experimental reactor, our scientists were able to complete two years later, that is in September 1947, the now famous NRX Reactor at Chalk River. This is the reactor the Director of the United States Atomic Energy Commission's Reactor Development Programme called in 1949 "the reactor of most advanced design and performance anywhere in the world". More recently, in the Purvis Memorial lecture a few months ago, Sir John Cockroft, to whom the Canadian Government owes a very great debt of gratitude, called the Chalk River NRX Reactor "by far the world's most powerful.. owing to its high rating in megawatts per ton....for studying the economics of natural uranium reactors".

In 1951 work was started at Chalk River on a new natural uranium heavy water reactor which will be called NRU and will have an even higher neutron flux than the NRX Reactor. The primary object of the Canadian atomic energy programme is the development of economical electrical power from nuclear energy. One of the recent studies carried out in Canada suggests that electric power can, perhaps within a few years, be produced using heat from the burning of uranium in an atomic reactor at a cost which would compete with coal at $8.00 per ton.

It is sometimes forgotten that the generation of large amounts of electricity at low cost by the application of atomic energy is as much dependent on an adequate supply of uranium as upon the availability of efficient reactors. Eldorado Mining and Refining Limited, the Canadian Crown company responsible for the raw material side of our atomic energy programme, has carried out a successful programme to increase the supply of uranium. At present the production of uranium in Canada is three times what it was at the end of the Second World War and it has been estimated that by 1956 it will be eight times as great. The drive to find new sources of uranium got into full stride in 1947 and late in that year a large number of radioactive occurrences were found in the vicinity of Beaverlodge Lake in northern Saskatchewan. Construction of a mining plant and concentrator at Beaverlodge was started in April 1952 and by May 1953 the plants were in operation. Late in 1952 a privately owned company discovered a second major property in the Beaverlodge area. Today private companies are producing uranium ore in that region and are planning production of ore from the important discoveries that have been made in the Blind River area of Ontario near the northern shore of Lake Huron.

On the way towards the development of economical atomic power, Canadian scientists have developed a unique type of bomb -- one that has brought hope in place of fear to the hearts of many victims of cancer. In my country, cancer is still the second leading cause of death. Because of diagnostic aids for earlier detection, advances in surgery, the wider use of radium and the development of the cobalt bomb, thousands of cancer victims in Canada and elsewhere are still alive today who would have had little hope of recovery a few years ago.

As Minister of National Health and Welfare, I have followed with particular interest the applications of radio-isotopes not only to cancer but to a wide range of uses in the diagnosis and treatment of disease and in medical research.

It is just three years since the first cancer patient was treated with Cobalt 60 radiation in London, Ontario, where the first installation of this equipment was made. As compared with x-rays, the cobalt bomb can do the work of a two-million volt x-ray machine, which would cost almost three times as much. This development is therefore bringing radioactive therapy within the reach of all sufferers.

The active ingredient of this bomb is Cobalt 60, which was developed as a by-product of the high neutron flux of the NRX reactor at Chalk River. Although Cobalt 60 is perhaps the best known, the Canadien Government establishment at Chalk River produces more than a hundred radio-isotopes for export. Ordinary cobalt, in the form of tiny pellets is placed within the core of the NRX reactor and left there to be bombarded by neutrons for 12 to 18 months. Cobalt 60 is at present being used for the treatment of cancer in beam therapy units developed at Atomic Energy of Canada which have been installed not only in our own country but in hospitals in the United States, United Kingdom and Italy. France, Brazil and Argentina will soon be added to this list. Almost all cobalt therapy machines in use in the world today were made in Canada. Various other isotopes have been shipped from Canada to the following countries: Argentina, Australia, Belgium, Brazil, Chile, France, Germany, India, Israel, Jamaica, Japan, Sweden, Switzerland, United Kingdom, United States and Venezuela. In addition, procurement procedures have been established with Denmark, New Zealand and Norway. In the past few years we have exported to other countries isotopes having upwards of 28,000 curies of activity - more than twice as much as we have used at home in Canada.

Many other uses of isotopes have been developed in Canada ranging from the testing of welds on enormous metal castings to the control of the thickness of paper as it comes through the paper-making machines. These isotopes have also been made available to countries throughout the world.

My United States and United Kingdom colleagues have spoken in some detail about what their governments are prepared to do in the immediate future during the period when the International Atomic Energy Agency is being negotiated. The Canadian Government is also giving sympathetic consideration to parallel interim activities. We cannot of course offer in Canada anything comparable in extent to the programmes indicated by Mr. Lodge and Sir Pierson Dixon. My Government agrees, however, that the first requirement of countries newly entering the atomic energy field is for their scientists to acquaint themselves with the basic technology on the subject. My Government is prepared to broaden its existing programme of exchanging reports on atomic energy with foreign scientific research institutes and is now in a position to furnish considerable additional information on the structure and operation of research reactors. We are also prepared to provide information on the techniques of exploring for radio-active ores and on their mining and milling operations.

In the field of health, Canadian cancer treatment and radio-logical research centres will welcome from other countries qualified radiologists and specialist physicians who wish to visit our clinics and study the application of radio-isotopes to the problems of disease.

As regards fundamental research in science and engineering, Canada's National Research Council has since 1948 carried out a programme of post-doctorate

fellowships tenable in Canadian laboratories. These fellowships, which carry a stipend of $3,000 per annum, are awarded strictly on merit, and there are no restrictions as to the nationality of the applicant. During the period since 1948, 488 of these fellowships have been awarded, of which 400 went to students from countries other than Canada. It is expected that this programme will be expanded during the coming year. It is true that a good many of the students holding fellowships work in fields not directly related to atomic energy, but the knowledge and experience they gain adds to the reservoir of scientific and engineering competence which is essential to any nation proposing to establish an atomic energy programme.

As the number of industrial and medical facilities in Canada making practical use of atomic energy increases, it will no doubt be possible to develop courses of instruction which will be useful to scientists, engineers and technicians from other countries. In fact the feasibility of establishing some such courses in the near future is now being studied, to supplement what we are already doing in the field of technical assistance through the Colombo Plan and under the United Nations Programme.

Possibly the first occasion to focus world-wide attention on the efforts of countries with the experience in atomic energy to speed the development of peaceful applications by making freely available the knowledge thus far acquired, will be the International Scientific Conference which it is proposed should be held in the summer of 1955. Canadian scientists are now preparing papers for this Conference which will contain information, particularly in the fields of uranium production and power reactor technology, which will be of value to scientists of other countries.

To avoid possible confusion I think I should reinforce the caution which has been given by the representatives of the United States and United Kingdom when they explained that it is not the intention of the eight countries now negotiating to set up the International Atomic Energy Agency that the International Scientific Conference should review or advise on the negotiations concerning the agency. This will be a large and important congress of scientists from all over the world -- perhaps a thousand or more. They will be meeting to discuss all aspects of the peaceful uses of atomic energy for about two weeks. Their ideas and suggestions will without doubt provide the International Atomic Energy Agency, when established, with a great deal of valuable material concerning the lines along which international co-operation could most fruitfully be developed. The conference, as we see it, however, will not be directly concerned in any way with the diplomatic negotiations for setting up the Agency. Indeed we would hope that plans for the Agency would already be well advanced by the time the conference meets.

The Agency and the Scientific Conference are, I believe, two distinct operations neither of which would benefit from any attempt to confuse the two. The two operations are mutually supporting and aimed at the same general objective--the most rapid and effective international co-operation in the development of peaceful uses of atomic energy. The first--the Agency--is essentially a diplomatic operation, while the second is essentially scientific. The immediate object of the diplomatic negotiations is an appropriate piece of international machinery to assist in international co-operation. The conference will be producing ideas as to what the Agency should do, what forms of co-operation it should encourage, what priorities, and so forth.

Mr. Chairman, I began my statement by saying that international co-operation had been the outstanding feature in nuclear physics since the turn of the century and that without it we could never have pried open those few secrets of matter and energy to which we have now been given some degree of access. I think, for example, of that December day in 1942 when, through the efforts of scientists from a dozen nations, the first nuclear chain reaction was achieved in an old squash court under the west stands of the University of Chicago athletic stadium. To other fellow scientists who had contributed their knowledge and efforts from further afield, the now famous pre-arranged message was flashed: "The navigator has landed. The natives are friendly".

Since 1942, the forces of atomic energy have not always proved friendly to man. Indeed fears have been expressed, notably by those in the best position to speak with authority from full knowledge of the facts, that atomic energy could now be used in such a way that organic life on this planet would be destroyed. On the other side of the coin there is the dazzling possibility of a more abundant life in larger freedom made possible for all peoples through the application of atomic energy to peaceful uses. This is indeed a choice, as Mr. Bernard Baruch once said before the United Nations, between the quick and the dead. Our response to this choice cannot and must not be dictated by any narrow or shortrun concept of our national interests. We seek no special advantages for ourselves. We are not trying to turn the atom into a gimmick in the Cold War. Is it too much to hope that, in the situation in which we find ourselves as human beings on this planet, we might be able to agree to make a common attack upon the remaining problems which still bar us from the fullest utilization of atomic energy for peace? And might we not, in that joint enterprise, regain sufficient mutual trust to carry us forward in the common endeavour to eliminate all possibility of atomic energy being used for anything but peace?

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