

No. 55/15

Effects of Atomic Radiation

Statement by the Minister of National Health and Welfare, and Chairman of the Canadian Delegation to the tenth session of the United Nations, Mr. Paul Martin, made in the First Committee, November 1, 1955.

The Canadian Delegation agrees with the proposal of the United States for the establishment of a special Technical Committee to co-ordinate information relating to the effects of ionizing radiation because it is conscious of the primacy that must be accorded to human values in the development and application of nuclear energy.

There is no need to re-state in this body all that has been said about the cataclysmic effect for our civilization of the release of nuclear energy. Like all such forces, it has incalculable possibilities of good and evil. It would be cowardly in the extreme to renounce the prospects of good because of the fear of evil. Nor could we now, even if we wanted to do so, exercise the new force we have liberated. We have no alternative but to behave like civilized human beings in the face of this magnificent and terrible challenge. To save ourselves we shall need discipline and intelligence of a high order. We must also be fearless in our pursuit of truth. This is too dangerous a matter to allow us the luxury of personal or national pride and prejudice. It is necessary that we work together on this subject, and I trust that, although differences of view are bound to exist on means and methods, we can at the end attain the splendid unanimity that was achieved - in spirit if perhaps not in fact - at the conclusion of our debate on the peaceful uses of nuclear energy.

Radioactivity, of course, is not a new phenomenon. Since life first appeared on this planet, living beings have been exposed to cosmic and natural radiation from minute quantities of radioactive materials in the soil and elsewhere. With the discovery of X-rays in 1895 and of radium a year later, the possibility emerged that some human beings would be exposed to greater amounts of radiation than naturally occur in the everyday environment.

In the early years, when these new medical tools were used without adequate precautions, a number of persons suffered harmful consequences, and in some cases died, from the cumulative effect of exposure to uncontrolled radiation over a prolonged period. In some industries, too, such as the luminous paint industry, workers have suffered injury and death from radioactive materials taken into the body. Since that time, a system of protection

has slowly developed and extensive precautions are now observed in the atomic industry and by enlightened radiologists.

In spite of the fact that safeguards of this kind have been in effect in my own country for some years, the health problems associated with radiation have increasingly engaged the attention of officers of my own Department of National Health and Welfare and of a number of other government agencies since the development of our atomic energy programme. In addition to the protective measures taken by the authorities at our Atomic Energy project to ensure the health and safety of their own workers, extensive precautions are required to safeguard the health of persons working with radioactive isotopes in research laboratories and industry. Medical uses of radioactive isotopes are subject to review by physicians specially experienced in this field. We find it necessary, also, to provide assistance and advice on measures for the safe storage, transportation, handling and waste disposal of radioactive materials of all kinds.

A broader problem is presented by the undoubted fact that in recent years there has been a slight, though appreciable, increase in radiation all over the world. The health implications, for our own and succeeding generations, of this increase in radiation warrant the most sober and thorough consideration. Already significant studies are being pursued in a number of countries, with the result that a body of scientific literature in this field is rapidly developing. It must be acknowledged that some conflicting views have been expressed, but the consensus of the best scientific evidence available seems to be that no significant immediate or long-range harmful effects of serious proportions will result from the increased radioactivity that has occurred.

Nevertheless, it would appear to me as a layman that there remain a number of unanswered questions, particularly in relation to possible genetic effects, which underline the need for the compilation and co-ordination of existing information by a body such as the proposed technical committee and which call for continuing research by competent scientists. With this in mind, the Canadian Government instructed officers of my own Department early this year to accept this whole question as a national public health problem and to begin exploring and further areas and methods of investigation. It may be of interest to the Committee to review briefly the steps that we have taken in this regard. I mention these, not in order to draw particular attention to what we are doing in Canada but because they may serve to illustrate the kind of work now being done and the substance, therefore, of what the proposed committees would be concerned with.

We approached this problem by establishing a national Committee, consisting of outstanding experts from the various interested government agencies and from Canadian universities. This Committee held its first meeting last May and recommended three areas for special investigation.

1. The monitoring of certain materials for radioactivity.

It was proposed to institute a nation-wide programme for the assay of some of the more toxic radioactive materials, such as radioactive Strontium 90, in certain substances. This programme has now been started by my Department with very considerable assistance from members of our atomic energy project at Chalk River, Ontario. Later, as the programme develops, the work will be extended to provide for the systematic measurement of other radioactive materials present in the general environment which may be potentially harmful to human health. The whole project will be carried out as a long-term survey.

2. A study of genetic effects of radiation.

Experiments on certain rapidly-breeding lower forms of life, such as bacteria, plants, insects and small mammals, have established the fact that genetic changes can be produced by exposure to radiation. By analogy it is assumed that the same phenomenon will occur in humans, but it will take many generations to assess the magnitude of the problem.

I am told by my medical and technical advisers that, in determining genetic effects on man, there are two principal difficulties. First, most mutations will remain hidden until one individual receives the same mutated gene from both parents. Secondly, naturally occurring genes for recessive defects and abnormalities are already numerous in the population. Neither these naturally occurring mutant genes nor those that might be induced by radiation are likely to produce a significant effect in the children of the individuals carrying them unless the parents have received the same defect from a common ancestor.

The genetic problem is exceedingly complex; the important factors are not known and our scientists are attempting to carry on useful investigations in this field. A great deal of study has gone into this question, and a long range programme is now being developed for the collection and study of human data that will aid in the assessment of this problem.

3. A study of the somatic effects of radiation.

In addition to the possible genetic effects that might show up in future generations, there is the more immediate problem of harmful effects from radiation that might be induced in directly-exposed individuals. A plan for the study of these so-called somatic effects is being worked out for the approval of the national Committee to which I have already referred. Studies of those conditions which might result from undue exposure to radiation will be largely of a statistical nature, although some laboratory work is contemplated.

Much detailed planning has gone into these projects and my Government would be happy to make data available to a special Technical Committee, such as that Proposed by the United States Delegation, so that we may share with other member states of the United Nations information on the techniques employed and the results

obtained from these studies. The progress already made in my own country in undertaking research of this kind leads me to conclude that other member nations will have initiated similar projects. For this reason, if only to avoid costly and unnecessary duplication of effort, it would seem desirable at this stage to provide machinery for the compilation of scientific data now available to individual member states which may not have yet been widely circulated.

And now, Mr. Chairman, I should like to comment very briefly on four points, arising out of the statement made yesterday by the United States Representative, which I feel should be mentioned in order to make clear the position of my delegation which would be prepared to support a proposal along these lines.

First, the Committee envisaged is to consist of qualified scientists nominated by governments. We agree fully that a committee of this kind should be small. On the other hand, in a field of such complexity, it would be unreasonable to expect any one individual from any nation to be sufficiently knowledgeable to deal intelligently with all the intricate questions that might come before the Committee. We, therefore, would like it understood that the scientific representatives on the Committee could feel free to call in alternates and consultants as necessary.

Secondly, I should like to call the Committee's attention to the terms of reference of the special body to be established. It is suggested, quite appropriately in our view, that the special Committee will undertake what will in effect be a survey. This is the logical first step to enable governments to assess the situation in the light of the facts as they will have been established. The Governments will then have information on the levels of radiation through the whole world instead of just in their respective territories as at present and will thus be in a position to determine the hazards involved on the best and most authoritative available information. The Committee should do more than circulate reports. It should organize systematically the materials received, putting the various contributions in proper perspective. Perhaps its most important work will be to tackle the difficult problem of recommending a research programme to answer the questions which now beset us. In this undertaking it will of course be essential to proceed on the basis of information received from national committees.

I come now to my third point which relates to the date of July 1, 1958, or earlier, by which the Committee is expected to provide a summary of the reports received. The Canadian Delegation agrees that it is important to have some sort of deadline in order that, on the one hand, the report will not be unduly delayed, and, on the other, that we should not be pressed into bringing in a report prematurely on the basis of insufficient data. I should like to make it clear, however, that in our view, a report delivered by 1958 should not be regarded as final and conclusive, particularly in relation to genetic effects, the study of which may well extend over many years and, indeed, several generations.

Finally, there is the question of the participation of the Specialized Agencies. The Delegation of Canada endorses wholeheartedly the view that the Specialized Agencies should concert with the Committee concerning any work they may be doing or contemplating within the sphere of the Committee's jurisdiction. We do not think that any specialized agency should presume to take over the duties of the Technical Committee. On the other hand, WHO, for example, which has recently established a section to deal with health problems arising from the use of nuclear energy - and other of the specialized agencies - may be in a position to make useful contributions.

Through the ages, each new scientific and industrial advance has brought with it new problems. We have only to think of the airplane. While the airplane has done a great deal to bring people and communities closer together, it has created a whole new set of problems relating to such matters as the regulation of international air routes, safety and health standards. Nuclear energy is, in a sense, unique among scientific discoveries in that preventive action against the hazards it may create is now being taken well in advance of its actual widespread development.

Mr. Chairman, few discoveries in recent times have made such an impression on the human mind as the release of nuclear energy. This generation has an obligation to posterity to hand down the legacy of nuclear technology not only with all its useful potentialities but also with corresponding knowledge of how to deal with its inherent hazards.

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