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VERBATIM RECORD OF THE SEVEN HUNDRED AND SEVENTY-FIFTH MEETING

Held at Headquarters, New York,
on Tuesday, 1 November 1955, at 3 p.m.

Chairman: Sir Leslie MUNRO (New Zealand)

Effects of atomic radiation [59] (continued)

- (a) Co-ordination of information relating to the effects of atomic radiation upon human health and safety
- (b) Dissemination of information on the effects of atomic radiation and on the effects of experimental explosions of thermo-nuclear bombs.

Statements were made by:

Sir Pierson Dixon	(United Kingdom)
Mr. Martin	(Canada)
Mr. Kuznetsov	(USSR)
Mr. Nuñez Portuondo	(Cuba)
Mr. Ryckmans	(Belgium)

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EFFECTS OF ATOMIC RADIATION /Agenda item 59/ (continued):

- (a) CO-ORDINATION OF INFORMATION RELATING TO THE EFFECTS OF ATOMIC RADIATION UPON HUMAN HEALTH AND SAFETY
- (b) DISSEMINATION OF INFORMATION ON THE EFFECTS OF ATOMIC RADIATION AND ON THE EFFECTS OF EXPERIMENTAL EXPLOSIONS OF THERMO-NUCLEAR BOMBS

The CHAIRMAN: The representative of India wishes to make a brief

addition to his statement of yesterday. As there are no objections from

the other representatives whose names are on the list of speakers, I now call on the representative of India.

Mr. Krishna MENON (India): In the observations which I made yesterday,

there were a number of points on which I should have expressed my delegation's

views and failed to do so -- probably because I had to traverse realms which were

not very familiar to me. I therefore reserve the right to intervene again at

a later stage of the debate.

There is, however, one point that I wish to raise now, and I shall take only

a moment. I raise the point now because I should like to put the Secretary-

General on notice.

From the views that have been expressed in this Committee, the General

position appears to be that a committee, or another body of that kind, should

be established to collect data and assist in the dissemination of information in

the world. That point of view was advanced yesterday. Such a project would

require the assistance of the Secretariat; in fact, it would probably require an

initiative on the part of the Secretariat. However that may be, we wish to know

whether the Secretary-General would be able to furnish a working paper on this

subject, as he did on the subject of the peaceful uses of atomic energy. If

there were such a working paper, we should be speaking more in the context of what

is practical than in the context of theory.

I therefore would ask the Chairman whether it is possible to obtain from the

Secretary-General an expression of his views on the question of furnishing the

material to which I have referred. In this connexion, I would say that I am not

asking the Secretary-General for an opinion: rather, I am asking for the basis

on which the Committee could form an opinion.

The SECRETARY-GENERAL: The paper to which the representative of India refers was prepared last year on the basis of studies undertaken by the Secretariat. No such studies have been organized this year. For that reason, if we were to meet the wishes of the representative of India, we should have to take the initiative and go into this matter. I am quite willing to do that. I should, however, like to make the presentation of a paper dependent upon -- not the results of the study -- but the experience we obtain; that is, whether what emerges from such a Secretariat study is likely to prove of any use. That may be the case. If so, I shall be happy to present a paper. On the other hand, if a study which we undertake on short notice does not seem to add anything, I am sure that the representative of India would agree with me that there would not be a very strong reason for presenting a paper.

On balance, however, I believe that we may make a contribution, and I shall certainly see to it that we do what we can.

Mr. Krishna MENON (India): Thank you very much.

Sir Pierson DIXON (United Kingdom): I am sure that we all listened with great interest and attention to the speech of the representative of the United States on this important question which is before the Committee, as well as to the weighty contributions made by the representatives of Sweden and India. As Mr. Wadsworth reminded us, one of the problems which arises in this new scientific era is the fact that the use of atomic energy is inevitably accompanied by the production of large quantities of radioactive materials which can, in certain circumstances, be harmful.

The sudden realization that radiation can be harmful has, understandably I think, led to considerable apprehension in the mind of the public. The anxiety which is felt on this score is something separate from the universal recoil from the horrors of atomic warfare: it is a deep-rooted, if vague, anxiety that this new scientific discovery may be disturbing the course of nature and affecting the biological development of the human species. This fear of the unknown is preying on the minds of many people throughout the world.

All of us will recall that it was on the initiative of the United States that this question was brought to the attention of the United Nations. Sensing the intense public interest in the possible dangers of nuclear radiation, Mr. Lodge, speaking on behalf of the United States Government, proposed, at the United Nations tenth anniversary meeting at San Francisco on 21 June, that this present session of the General Assembly should establish a procedure to receive and assemble radiological information collected by the various States, as well as the results of national studies of radiation effects on human health and safety. Mr. Lodge went on to say:

"The collation by the United Nations of scientific reports and data on radiation levels could set at rest unjustified fears, combat sensational distortion in the light of truth, and lead to humanity's learning how to deal best with problems of atomic radiation."

On 18 July, Her Majesty's Government in the United Kingdom announced that it welcomed Mr. Lodge's proposal to bring this important question before the United Nations, and that it would support a resolution in the United Nations

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on the lines of the United States proposal. Other countries also have shown great interest and concern in this question. The Indian delegation has submitted an item on this subject, which now figures on our agenda and on which Mr. Menon has spoken so eloquently. The Swedish Government, too, has indicated its active interest in this matter. I sincerely hope that as a result of our deliberations here we shall be able to tell the world that the United Nations is actively interesting itself in this problem and will take steps to grapple with it.

I spoke a moment ago about public apprehension of the effects of atomic radiation. There is, however, some confusion in the minds of many between the immediate effects of direct exposure to a strong radioactive source and those effects which it is said by some may be attributed in the long term to a rise in the atmospheric level of radioactivity. In order to get to grips with the whole problem of ionizing radiation, it is essential to appreciate that these are two separate questions. There is already a great deal of information about the effects of the former; in respect both of the radioactive "fall-out" from weapon tests and of exposure from other atomic energy activities, and from the use of X-rays and radium throughout the world.

According to the statement yesterday of the United States representative, the average exposure to the United States population as a whole, from all tests and all atomic energy activities since the beginning of the atomic energy programme in the United States, amounts only to a small fraction of the exposure from natural background radiation during the same period. Man has been exposed to direct radiation doses ever since the invention of X-rays. Much is already known about the best methods of protection and the volume of knowledge is growing. I hardly need to remind the Committee that the International Congress of Radiology and its affiliated body, the International Commission on Radiological Protection, have done and are continuing to do important work in this field. Similar valuable studies are being undertaken by the International Labour Organisation and the World Health Organization. I do not therefore think that it would be desirable for the United Nations to promote any further detailed work in this particular field. After all, such work could be undertaken only by calling on the same experts as are engaged on the studies for these other bodies, and a duplication of effort would mean only a waste of time.

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In contrast, there is relatively little information about what it is alleged might be the long-term effects on the human race of a rise in the atmospheric level of radioactivity. In the first place, there is insufficient information on what are the present levels of radioactivity, or, as it is sometimes called, the background level of radiation. In the second place, we are not in a position at present to determine the effect on the human race of small, medium or large increases in the background level of radiation. With so many gaps in our knowledge, and with so much yet unknown, the field has been open to lively speculation and sweeping generalizations.

This particular problem belongs to the highly specialized field of genetics. A body of knowledge is being gradually built up. But the geneticists themselves, the people best qualified to speak, have been reticent in making statements, no doubt because they realize, better than any, how sketchy our information is in this field. Rather surprisingly, pronouncements have come mainly from scientists gifted in other fields -- mathematicians, chemists and philosophers. To a student of an earlier age it strikes me rather like Pythagoras and Parmenides trespassing on the field of Hippocrates.

Thus there is a general lack of information, matched by intense public interest in this question. In these circumstances it is essential that as much agreement as possible should be reached among the experts concerned on the facts, so far as they can be known. We are most anxious to secure as considered a view as we can on this matter by the people most competent to assess the present information. We therefore fully support the United States proposal that this General Assembly should set up machinery which will establish the facts. We want to secure a general consensus of views of those in the best position to reach sound conclusions on the information that is available.

Let me give some illustrations, based on our knowledge of the problem in the United Kingdom, of the gaps in the documentation of this problem. All talk of increases in the background level of radiation presupposes that we know what the level was a few years ago and to what level it has now risen. But that is precisely what we do not know. Some estimates can be made for particular places, or under particular circumstances; but, surprising as it may seem, there is no accurate knowledge of what is the existing background level of radiation in different parts of the world.

All that is known is that the background is not uniform throughout the world; it varies according to the local geological and geophysical conditions. This is a natural state of affairs, due to the inherent radio-activity of our planet.

Then again, various means of collecting samples of the atmosphere can be employed. In turn, the radio-activity of these samples can be determined in a variety of ways. But different methods of collection and measurement produce results of varying degrees of accuracy.

It is clearly invalid to assess a rise in the background level of radiation in a particular place by comparing measurements relating to other places, measurements which have been made on a different basis. Any such apparent rises in the background level may not be due to any real rise in the level of radiation. They may be simply due to differences in the methods of assessing this level.

In view of all this uncertainty, it seems clear that the first thing to do is to reach agreement on what is the most acceptable means of collecting samples, coupled with agreement on a standard method of determining the radio-active level of those samples.

This task obviously can only be done by qualified scientists. My Government considers that a suitable committee of scientists appointed by the United Nations could do most valuable work in recommending acceptable methods of collecting samples and acceptable standards to be followed by scientists throughout the world. When measurements upon these agreed standards become available it will then, and only then, be possible for the first time to

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assess the difference in the background level of radiation between different parts of the world, and, in time, to assess any changes that may have occurred in that level in particular places.

I think that we will all agree that such measurements when made should be published regularly. Publication of these results in some standard form would spread knowledge of the real facts and reduce the area for speculation.

I said a moment ago that we know that, as a natural state of affairs, the background level of radiation is not uniform throughout the world. We know that there are wide differences in the background level of radiation between different areas, depending upon the height above sea level at which the measurements are made and upon the nature of the sub-soil.

For example, cosmic ray radio-activity is greater, at high altitudes, and soils containing uranium in low or high degree of concentration are radioactive. In the United Kingdom it is known, from what measurements have been made, that the background level is much higher in parts of the Highlands of Scotland than in southern England. In the United States, I am informed, the background level is much higher in Wyoming than in New York. It is also known that the background level of radiation is higher in towns than in the country, and that it is lower in summer than in winter when more coal is being burnt.

What inference can be drawn from these facts on the information at present available? It is this: even if we presume that some increase in the radiation background has occurred during the last decade at particular places owing to the use of atomic energy, this increase, it seems, is not as great as the variations which exist in nature in the level of radiation in different areas. This is not only interesting: as far as it goes, it is also reassuring.

I now turn to the biological, the human, aspect of this problem, which is the most disturbing in the public mind.

One of the factors in the physiology of the human being is the combining of the sets of germ cells -- which contain a number of genes -- from male and female parents, so that the offspring inherits a pair of sets. If either of these sets is altered by radiation, physical defects in a later generation might be the result -- or, in technical language, harmful mutations might occur.

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United Kingdom)

Much has been said of the possible genetic effects of a supposed rise in the atmospheric level of radiation. It has been said that a rise in this level will increase the volume of harmful mutations; but it must be remembered that the human race has been exposed to natural radiation since the beginning of time.

As we know, we are all exposed to a small amount of radiation from cosmic rays, from naturally occurring radio-active materials in the ground, from drinking water and from the radio-active elements naturally present in our bodies. I am told that the radio-active content of the drinking water in New York City is seven times higher than that of drinking water in London. Scotsmen -- to continue to cite examples from the British Isles -- have been exposed to much higher levels of natural radiation than people living elsewhere in the British Isles. But no one has yet been able to say that more harmful mutations occur in Scotland than in other parts of the world.

Genetic mutations occur, of course, continually in the human population. Some, it seems, are continuous; some may be induced by the radiation background. Genetics is a highly specialized branch of biology; and the effect of additional doses of radiation on the occurrence of mutations in human beings is difficult to predict. The necessary research work has never been done.

Of course, geneticists for some time have been engaged in studying this problem and they have conducted a considerable amount of experimental work with plants, insects, particularly flies because of their rapid productive rate, and mice as small mammals.

As I have said, a body of knowledge is gradually being built up; but the scope for inferences is so wide that most geneticists are understandably cautious in making pronouncements on this matter. So far the experimental work has been carried out only on plants, flies and mice. Mice and men are very different things in the present state of our knowledge in regard to the likely effects of an increase in the radiation dose upon the human race. How, then, can the public be expected to discriminate between the pronouncements of one geneticist and another, or indeed between a geneticist and a mathematician? So far as the ordinary man is concerned, all scientists are presumed to speak with equal authority.

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Before deductions in regard to human beings can be safely drawn, much more

work on the genetic effects of radiation needs to be done. I am advised that the

most fruitful field is concentration on the study of the genetic effects of an

increase in radiation upon the small mammals, since they have a much shorter span

of life and a much more rapid development than man. But even in so relatively

circumscribed a field, the work will be laborious and results cannot be made

available quickly. It is, however, encouraging to note that much more work is

now being done on this question in laboratories all over the world. If "the

proper study of mankind is man", we must not be ashamed to begin with mice.

There would seem then to be three distinct tasks which have to be tackled,

even though it may take many years to do so with any degree of accuracy. These

are: first, to establish, as far as possible, the level of ionizing radiation,

obtaining in different parts of the world; secondly, to estimate the increases

which may occur in these different levels and the cause of such increases;

thirdly, to evaluate what effects, if any, such increases in the level of

ionizing radiation may have on man and his environment.

I think that I have said enough to show that this whole problem of the

effects of radioactivity on man and his environment is a highly technical problem

and a problem for the scientists, a problem on which comparatively little

scientific work has been done so far. It is a problem about which we above all

need to know more facts before we can proceed to draw deductions. It is a

problem which easily lends itself to unscientific speculations and popular

misconception. It is a problem vaguely connected in the popular mind both with

the terrors and with the allurements of the age of the atom. It arouses more

curiosity than all the alchemy of the Middle Ages. It is as hair-raising as a

werewolf, as sensational as witchcraft. But we live, not in the Middle Ages, but

in the 20th Century. If ever there was a problem which demanded a scientific,

factual approach, here is one. In this age of enlightenment we do not fear

facts; but let us know first what the facts are.

I believe that the United Nations can help in this work. The United Kingdom

delegation therefore fully supports the proposal made by the representative of the

United States, that the United Nations should set up a scientific committee,

that is, a committee of qualified scientists nominated by governments to study this question. It is important that they should be nominated by governments because the scientist on the committee would then be able to draw upon the entire scientific resources of his country to assist him in his task.

The first task which such a committee could usefully tackle would be to recommend uniform standards for the methods used in collecting samples for measuring the background levels of radiation. The various reports on such levels, which are being compiled by States, could then be assembled in a comprehensive form by the committee. This work would materially assist in the complementary task of estimating any increases which there may be in the background level of radiation in different parts of the world.

The additional task of estimating the effects upon man and his environment of any increase in the level of radiation is of such magnitude that the proposed committee could not be expected to tackle it on its own. Such a committee, meeting from time to time, would clearly not be in a position itself to do any original research. Research in this field must clearly be laborious, and for the reasons I have given, must be pursued over a number of years. It is best done by the specialists in the different scientific fields, in their own countries, working in close touch with one another, in order to experiment with and test their theories in their own laboratories.

It may well be that the committee itself, in order to ensure that the various branches of science involved are properly covered, should reflect in its composition the various scientific interests.

Sometimes the conclusions of these different national groups of scientists may not be altogether consistent. There is bound to be some difference in the results obtained in any relatively new field of scientific research. Differences in results are likely to occur even more in genetic experiments on small mammals which, by their very nature, are more complicated than experiments dealing with inanimate matter.

Sometimes in a particular country the reports of teams of scientists in different laboratories may be collated in a national report. In my own country, for example, Her Majesty's Government has invited the Medical Research Council

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to prepare a report on the medical, including genetic, aspects of nuclear radiation. This report is being prepared by a specially appointed committee of some of the most distinguished British scientists in this field. The Medical Research Council, though financed by public money, is independent of the Government, and its investigation committee consists mainly of scientists who are not Government servants.

Other governments have taken steps to appoint similar committees. My colleague, Mr. Wadsworth, has told us that the United States National Academy of Scientists is undertaking a broad appraisal of the present state of knowledge about the effects of atomic radiation on living organisms. Other representatives will no doubt be able to tell us of the work which is going on in their own respective countries. They may have established similar committees. Over the next year or so these various national reports will be issued from time to time.

Although the proposed United Nations scientific committee could not itself undertake original work in this field, it could, I believe, do a most useful task in examining and collating the various national reports on the scientific observations and experiments, which would be transmitted by governments to the committee as they became available. The committee would evaluate these reports and prepare a summary in due course, if the assembled facts warranted it. In carrying out such a task, the committee should be able to indicate where particular results required confirmation. It could also usefully indicate research problems that require further study in fields hitherto unexplored by national authorities. Activity of this kind would, I think, be most valuable in minimizing an overlap of effort in different countries and thus help materially in securing a more rapid advance in our knowledge.

But, since the present state of our knowledge is so limited, any summary that the committee is to prepare must inevitably wait upon the development of observation and experiment in the various laboratories in different countries. It would only mislead the world if the committee were pressed to prepare such a summary prematurely.

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It would therefore, I submit, be unwise to hasten the work of the committee on this part of its task. The important thing is that they should have time to do their work effectively. Given the inadequacy of the information at present available, the scientists who will serve on the committee are bound to require time to reach agreement among themselves.

I am afraid that it might require at least two years before the committee would be in a position to prepare an effective summary of the various reports it will have received. In the meantime, however, it might well be possible for the committee to make annual reports on the progress of its work, but this should, I think, be left entirely to the committee's own discretion. In this connexion may I add that I do not think that we should put a time-limit on the life of the committee. As I see it, the committee will have a continuing responsibility in performing its important work. We must, of course, ensure that the work of the committee is made available in the proper form to States Members of the United Nations or members of the specialized agencies. This could best be done by transmitting from time to time to the Secretary-General, as the committee thinks fit, the fruits of its labour, with a view to their publication and dissemination. I should hope that the committee would be able fairly quickly to recommend standard means for measuring the background level of radiation. Such recommendations could be published as soon as they are prepared. As and when standardized measurements become available, it would be open to the committee to arrange for their publication. In much of this work, as in so many other technical fields, the specialized agencies have a particular interest and a very valuable contribution to make. It will be necessary to ensure that there is no duplication of effort and that the work of the specialized agencies concerned is properly co-ordinated with that of the proposed committee. The Secretary-General will, I feel sure, be willing to assist in this important part of the work and act as a link with the specialized agencies. I hope too that we shall be able to agree that the Secretary-General should provide appropriate assistance to the committee in organizing and carrying on its work. I am sure that the scientific committee would greatly benefit from this unique experience. As I see it, he would be able to call the committee together, give them invaluable advice in organizing their work and be of continuing assistance in the development of their labours. This then is how, in the view of my delegation, we should go about the task which is before us.

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(Sir Pierson Dixon, United Kingdom)

On the face of it, it might seem that the functions of the proposed

committee are likely to be dull and pedestrian. It is true that much hard,

factual work first needs to be done. But the scope for research in the

unexplored paths of science is great. Moreover, the mere fact that this work is

to be organized on an international basis, and will promote the exchange of

information between nations, is a deep source of encouragement in itself. It

will fortify our collective determination to pursue the peaceful uses of the

atom, as it will stimulate each individual nation to intensify its search after

greater knowledge of these secrets of nature.

I think that the proposed committee can perform an invaluable task,

and we hope that, as a result of its labours and with a firmer basis of

established facts, we shall be able to give from here some reassurance to the

world and help to dispel this fear of the unknown, so that we may step with

greater confidence into the atomic age.

Mr. MARTIN (Canada): I think that as we begin the discussion of

this very important question, we will all be grateful for the statements that

have been made by the spokesmen for the United States, Sweden, India and the

United Kingdom. And one gathers the impression that the United Nations increasingly

is coming to cope with very important questions which demonstrate the great

effectiveness and the great need of the United Nations in our world.

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 restate here all that has been said about the

cataclysmic effect for our civilization of the release of nuclear energy. 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, exorcise the

new force which 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 the highest order.

We must also be fearless in our pursuit of truth.

(Mr. Martin, Canada)

This is too dangerous a matter to allow us the luxury of personal or national pride and prejudice. It is necessary therefore 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 last week -- at least in spirit if not perhaps in fact -- at the conclusion of our debate on the peaceful uses of nuclear energy.

As has already been said by those who preceded me, radioactivity 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 discoveries of X-rays in 1895 and of radium a year later, the possibility emerged that some human beings would be exposed to great amount of radiation than naturally occurred in the every-day environment. I can say that I have been advised, on more occasions than one, by those more technically qualified to speak than I, that if with the discovery of X-rays this very effort which we are now engaged in at this time had been pursued, much valuable information would exist and much valuable time lost would have been avoided.

In the earlier 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 long 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 energy industry and by enlightened radiologists.

In spite of the fact that safeguards of this kind have been in effect in Canada 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 in industry. Medical uses of radioactive isotopes are subject to review by physicians who are specially experienced in this field. We have also found it necessary 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 for succeeding generations of this increase in radiation warrant the most sober and thorough consideration. As Sir Pierson Dixon has just suggested, 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, although 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 remains 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. As Sir Pierson Dixon has said, this is not a matter for a year's study. This is a matter that cannot be characterized by the use of the words *ad hoc*. This is a long-term proposition that will require the most competent skill and enough time to prosecute the proposed investigation and assessment. With all of this in mind, the Canadian Government instructed the officers of my Department early this year to accept this whole question in Canada

(Mr. Martin, Canada)

as a national public health problem and to begin exploring and planning further areas and methods of investigation. It may be of interest to the Committee if I reviewed 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 modestly in Canada but because they may serve to illustrate the kind of work now being done and the substance, therefore, with which the proposed committees would be concerned. We approached this problem by establishing a national committee consisting of outstanding experts from the various interested Government agencies and from our universities. This committee held its first meeting last May and recommended three areas for special investigation. First, 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 the Department of National Health and Welfare in Canada with the very considerable assistance of members of our atomic energy project at Chalk River in the Province of 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. Secondly, 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 human beings, but it will take many generations, I am advised, to assess the magnitude of this problem. I am further 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. This point was illustrated a moment ago by my colleague, Sir Pierson Dixon. Secondly, naturally-occurring genes for recessive defects and abnormalities are already numerous in the population. Whether 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.

(Mr. Martin, Canada)

It must be apparent that the genetic problem is exceedingly complex; all the important factors are not known and our scientists are attempting to carry on useful investigations in this field. When I say our scientists, I mean the scientists of the world as well as those in our own country who have special qualifications. 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.

Thirdly, 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 now being worked out for the approval of the national committee to which I have made reference. Studies of those conditions which might result from undue exposure to radiation will be largely of statistical nature, although some laboratory work is contemplated.

Much detailed planning has gone into these projects, and the Canadian Government will be happy to make data available to a special technical committee such as that proposed by the representative of the United States yesterday when he spoke to us, in order that we may share with other Member States of the United Nations information on the techniques employed and the results obtained from these various 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. I was aware and happy to be reminded again by Sir Pierson Dixon of the work in this particular by non-governmental research bodies operating with government assistance.

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.

Now I should briefly like to make four points which arise 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, and to indicate the lines along which we would be prepared to support a proposal such as the one which, in general form, he gave to us yesterday.

First, the committee envisaged by Mr. Wadsworth and by the Government of his country is to consist of a qualified group of scientists, nominated by governments. We agree fully that a committee of this kind should be a small one. On the other hand, in a field of such complexity would it not 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, and my friend, Mr. Wadsworth, nods his head in approval.

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 basis of the best and the most authoritative available information. However, the committee, as we see it, 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.

(Mr. Martin, Canada)

(Mr. Martin, Canada)

I come now to my third point which relates to the date of 1 July 1958 or earlier, by which the committee is expected to provide a summary of the reports received. The Canadian delegation of course 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. This was a point made by Sir Pierson Dixon a few moments ago. 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. My delegation 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, the World Health Organization, for example, which has recently established a section to deal with health problems arising from the use of nuclear energy -- and other 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.

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

(Mr. Martin, Canada)

As I said, few discoveries in recent times have made such an impression on the human mind as the release of nuclear energy. Because of this new source of energy, we may now be in sight of the day when worldwide improvements in the material standards of human life may be possible. Vast areas of the globe may be enabled to overcome the time-lag in their development, and by by-passing the laborious progression through the ages of steam and electricity to break their way directly into the new era. It is surely within our power to ensure that the atom will prove a benefit and not a bane to mankind. To this end, we must be concerned with its possible effects on the health and safety of our own and of future generations.

Mr. KUZNETSOV (Union of Soviet Socialist Republics) (interpretation from Russian): The First Committee is now dealing with the item on the

effects of atomic radiation. There are two sub-items here, the one submitted by the United States of America on co-ordination of information relating to the effects of atomic radiation upon human health and safety, and the other, presented by the delegation of India, on dissemination of information on the effects of atomic radiation and on the effects of experimental explosions of thermo-nuclear bombs.

(Mr. Kuznetsov, USSR)

Consideration of the problem of atomic radiation is very important, since the radioactive radiation resulting from the process of production and use of atomic energy presents a danger for human health and safety when it surpasses a certain concentration. It is necessary to distinguish between two sources of atomic radiation which are encountered in the use of atomic energy. Radioactive radiation is produced in the process of peaceful uses of atomic energy while working at an atomic reactor or with radioisotopes, in studying nuclear processes and so forth. These sources of radiation, however, do not present any danger to the people in the vicinity, provided necessary measures of precaution and protection have been taken. It is quite possible fully to safeguard human beings against the dangerous effects of radiation produced by these types of radiation sources.

The second source of radiation, as is well known, is the explosion of thermo-nuclear bombs, involving formation of numerous substances with great radioactivity, which are disseminated by aerial currents over considerable distances. Depending on the frequency of the atomic bomb explosions and on meteorological conditions at the time, the radioactive substances produced by those explosions may create harmful concentrations of radioactivity. The movements of air currents carrying the radioactive dust cannot be controlled. This radioactive dust can contaminate the soil, water reservoirs, plants, animals and human beings. Depending on the intensity and duration of radioactive irradiation and on the degree of penetration of radioactive particles into the human organism, exposure to atomic radiation may lead to very grave consequences such as serious sickness and death.

Attempts have been made to calm public opinion by asserting that, provided certain measures are taken, the explosions of thermo-nuclear weapons do not absolutely endanger human health and safety and present no particular menace to the environment. Some people undertake to calculate the so-called average level, or background level, of radiation on the earth, produced by atomic tests, and they are lulling us with assertions that this level of radiation is insignificant and that there are no reasons for alarm.

(Mr. Kuznetsov, USSR)

It is hardly necessary to prove that the references to background levels of radiation do not hold water. In fact, immense concentrations of radioactive substances have been created in certain areas as a result of atomic bomb explosions. To speak of background levels of radiation in this connexion is irrelevant; it is tantamount to speaking of the background or average temperature of patients in a hospital where some have an abnormally high temperature and some an abnormally low one. It may happen that the average temperature of the patients in the hospital is normal, but that does not make them healthy. It will be none the better for the patient if he is told that the average temperature of all the patients in the hospital is normal and hence there is no reason to worry.

Such an approach to the problem of the effects of atomic radiation cannot be agreed to. In the opinion of specialists, conditions may be created for the complete safety of people who work at atomic reactors and experimental installations in laboratories carrying out nuclear research. But it cannot be guaranteed that atomic explosions will not lead to the contamination by atomic radiation of human beings, animals and foodstuffs that happened to be in the zone of radiation.

Thus, Professor Masao Tsuzuki of Tokyo University reported to the Geneva scientific-technical conference that on the deck of the Japanese fishing vessel which was exposed to the atomic "fall-out" as a result of the nuclear weapon test in Bikini in March 1954, radioactivity in seventeen days after the "fall-out" equalled 110 milli-roentgen per hour and 80 milli-roentgen per hour in the living quarters of the ship. This radioactivity exceeded about 50 times the admissible international norms established for residential areas. The contamination of the fishermen by radioactive dust, as was reported by Professor Tsuzuki, caused a specific disease -- "radiation sickness" -- which decreased the number of leucocytes in the blood three times as against the normal level.

The effect of various types of atomic radiation on the human organism is the subject of comprehensive study by the scientists of various countries. We have heard about this in statements made by various representatives in this Committee. Many research papers reporting on work conducted by Soviet scientists also are devoted to this question. The Soviet representatives at the Geneva Conference on the

(Mr. Kuznetsov, USSR)

The Soviet scientists have elaborated prophylactic measures against radiation sickness, and these measures are being used successfully in the practical work of medical establishments.

The protection of the health of the workers who may be exposed to radioactive radiation in the process of their work on the utilization of atomic energy, is ensured in the Soviet Union by a system of state-wide measures. Norms of the maximum permissible concentrations of radioisotopes in the air are fixed by legislation.

Soviet legislation provides for a curtailed working day and extended paid leaves for persons who work in conditions which may lead to exposure to radioactive radiation. State control has been organized for enforcing existing legislation in this field, and relevant categories of workers are under systematic observation. Special hygienic rules are worked out with the aim of ensuring full safeguards against the harmful effects of radioactive materials on the human body.

Experience has shown that the system of prophylactic measures used in the Soviet Union guarantees the protection of health of persons working in the field of atomic energy.

However, in considering the question of co-ordination of information relating to atomic radiation and to the means and methods of protecting people against radiation, we should not lose sight of the main factor, namely that there is no guarantee of human safety against the effects of radioactive radiation produced in atomic explosions. No matter how thorough and comprehensive the study of radioactive radiation created by atomic explosions may be, it does not diminish the danger of contamination by atomic radiation. There is only one reliable way to eliminate the danger of harmful radioactive radiation produced in explosions, and that is the prohibition of the atomic explosions themselves.

The Government of the Soviet Union, eager to deliver mankind from the danger of atomic radiation and other grave consequences which may result from the use of atomic weapons, has repeatedly proposed to other States the conclusion of an international agreement on the prohibition of nuclear weapons and, as a first step, the reaching of an agreement on discontinuing all tests of all types of

Peaceful uses of Atomic Energy delivered a number of reports upon this subject. As established by research, the effects of radiation on the human organism

depends not only on the character of radioactive sources but considerably on the place of exposure to radiation. Radioactive radiation involves, as a direct

consequence, considerable changes in the central nervous system. Considerable changes also take place in the functioning of the cardio-vascular system, in the composition of the blood and in the intestinal system. Under the influence of irradiation the penetrability of vascular walls is decreased. The "radiation sickness" developed by radioactive radiation is frequently complicated by various infections, since the resistance of the organism weakens to a considerable

degree.

Experimenting with animals, Soviet scientists have established the fact that

the resistance of an organism contaminated by radiation becomes inadequate with regard to the infection of diphtheria, dysentery, enteric fever and other

infections. The effects of radiation may lead to disturbances in metabolism.

Dependent on the intensity and persistence of radioactive radiation, as established by research, certain processes are started in the living cells of the human

organism that lead to the decrease of the vitality of the cells and to their

ultimate destruction. The greater the dose of radiobiological contamination,

the sooner you can notice the biological changes in the contaminated organism.

While examining the radiobiological effects, it is essential to work out

measures of protection for persons dealing with radioactive radiation and effective methods of treatment of persons contaminated by radiation. It appears necessary,

to this end, to determine the effects of various types of radiation and of doses

of radioactive radiation on the living organism and to examine the mechanism of

these effects. This has to be done by experimentation with various animals.

It is practically important to determine admissible norms of radioactive radiation for people permanently engaged in handling radioactive materials, so as to ensure

for them safe working conditions.

these weapons. It has continued consistently and perseveringly to seek the agreement of other States, especially States possessing atomic weapons, to this proposal.

In this connexion, it seems appropriate to recall that the demand to stop atomic explosions was put forward in a number of countries. The representatives of India and Sweden have spoken here of certain steps taken in this direction by India and other countries. To this, other facts may be added. Thus, in April 1954, the House of Representatives and the House of Councillors of the Japanese Parliament unanimously adopted a decision "to ask the United Nations to take, without delay, effective and appropriate measures for the speediest establishment of the international control of atomic energy, for using atomic energy for peaceful purposes only and for prohibiting atomic weapons as well as for preventing the damages resulting from tests of atomic weapons".

In April 1954, the former prime minister of Indonesia, Mr. Sastraamidjofo, addressed an appeal to countries possessing the hydrogen bomb that they should discontinue their tests which endangered human life.

The conference of the Prime Ministers of India, Indonesia, Burma, Pakistan and Ceylon, held in Bagore in December 1954, adopted a decision for the discontinuation of tests of the hydrogen weapon. In the communique of the conference published on 29 December 1954, the Prime Ministers called upon all States to stop tests of the hydrogen bomb. They also appealed to the United Nations Disarmament Commission to take measures directed at the prohibition of tests of thermo-nuclear weapons.

The demand to prohibit atomic weapons and to stop their tests was unanimously supported by the Bandung Conference of twenty-nine countries of Asia and Africa, held last April. The Conference called upon all Powers concerned, pending the general prohibition of the production of nuclear and thermo-nuclear weapons, to reach an agreement on the discontinuation of experiments with these weapons.

The anxiety of public opinion of various countries in connexion with the effects of atomic radiation was pointed up by a statement of famous scientists published this summer, in which the attention of the peoples and governments was drawn to the danger resulting from radioactive substances disseminated in the air after atomic explosions.

(Mr. Kuznetsov, USSR)

(Mr. Kuznetsov, USSR)

Outstanding scientists addressed an appeal not to resort to war but to find peaceful means for settling disputes among the States. The scientists endorsing this appeal were the late Albert Einstein; the well-known British philosopher, Bertrand Russell; the famous French physicists and Nobel prize winners, Joliot Curie, Schweitzer and de Broglie; the famous Polish physicist, Professor Infeld; Professor Hideki Ukava of Kyoto University, and others. They also demanded that atomic weapons should be prohibited and that atomic bomb tests should be stopped.

One hundred and thirty Labour members of the British Parliament demanded, on 31 March 1954, that the Governments should take the initiative "to prevent the explosion of any new thermo-nuclear bombs and to reach an international agreement to seek the prohibition of atomic weapons and not to allow further tests and improvements designed for waging war".

In taking a decision on the question of atomic radiation, the General Assembly would fall in its duty if it did not call upon the States to continue their efforts with a view to an immediate elimination of the source of radiation dangerous for human beings, that is the explosion of atomic bombs. Although we are to consider separately the problem of the reduction of armaments and that of the prohibition of atomic weapons, nevertheless, taking into account the direct connexion between radiation and the tests of nuclear weapons, we consider it necessary for the General Assembly to express itself in favour of the earliest conclusion of an agreement between the States on the prohibition of nuclear weapons, and, as a first step, the conclusion of an agreement on the discontinuation of tests of all types of nuclear weapons.

The representative of the United States presented to the First Committee yesterday a proposal on the effects of atomic radiation. His proposal would call for the establishment of a technical committee consisting of scientists and experts. The task of the committee, as provided by the United States proposal, would be to compile, co-ordinate and study materials and reports with regard to the effects of ionizing radiation upon man and his environment, to publish and disseminate these reports among the States, together with their evaluation by the committee, as well as to develop standards, uniform for all States, with respect to radiation counting.

The Soviet Union delegation supports the proposal to establish such a committee. We agree that the committee should recommend uniform standards for radiation counting and procedures for sample collection, and should promote the establishment of these standards and procedures. Different admissible norms of radiation and different methods of radiation counting which now exist in various countries make it difficult to carry on research work and the exchange of information in this important field. Joint efforts by scientists of various countries are required to develop uniform norms and standard methods of atomic radiation counting.

The Soviet Union delegation considers that all States which wish to contribute to this task should be entitled to do so. This is the case for both Members and non-Members of the United Nations and of the specialized agencies. The greater the number of States which work on the problem of the protection of the health and safety of the persons who handle radioactive materials, the more fruitful will be the results obtained.

With that end in view, it seems essential to expand the membership of the proposed *ad hoc* technical committee for the study and co-ordination of information on atomic radiation. The establishment of the committee on a wide geographical basis would make the committee duly representative and would be very conducive to the success of its work.

The problem of atomic radiation cannot be limited to data on the levels of radiation and the effects of radiation upon man and his environment. Questions of protection from the dangerous effects of radiation and methods of treatment of diseases caused by radiation are also highly important.

In this connexion, it would be advisable to extend the committee's responsibilities by entrusting it with the compilation, integration and dissemination of experience in the field of developing means of protection and the most effective methods of therapy against the effects of atomic radiation. The integration by the committee of the experience of scientists of various countries in this field would greatly contribute to the development of effective means of protecting people against the harmful effects of atomic explosions and treating those who had been exposed to the effects of atomic radiation. That

(Mr. Kuznetsov, USSR)

(Mr. Kuznetsov, USSR)

would contribute a great deal to the extension of the use of atomic energy for the benefit of mankind. For the successful accomplishment of these tasks, the committee should co-operate with various international and national organizations operating in this field, such as the World Health Organization, the International Labour Organisation, the International Commission on Radiological Protection, UNESCO, and so forth. There is no ground to fear that this work will be duplicated, because there is more than enough for each organization to do in this domain. In the light of the significance of developing international co-operation on the problems connected with the effects of atomic radiation, it would seem desirable that the committee should be established within the framework of the United Nations.

The Soviet Union delegation suggests that the committee should prepare and submit the first summary of reports received on radiation levels and radiation effects on human health and safety, not by 1 July 1958, as is provided in the United States draft resolution, but by 1 October 1956. Much useful information on these questions has in fact already been accumulated, and the rapid compilation and dissemination of that available information would be highly desirable.

In conclusion, the Soviet Union delegation expresses the hope that its suggestions concerning the effects of atomic radiation will be given due attention by this Committee. For its part, the Soviet Union delegation will do its best to develop, in co-operation with other delegations, proposals commensurate with the task facing the Committee: the task of developing international co-operation in studying atomic radiation and developing and implementing effective means of protection and therapy against the effects of radioactive radiation.

Mr. NUNEZ PORTUONDO (Cuba) (interpretation from Spanish): The Cuban delegation wishes very briefly to express its opinion on the item now before the First Committee.

We have been extremely interested in the points of view expressed by preceding speakers in this debate. Logically speaking, no one could oppose a study of the various effects that may be produced by atomic radiation. We definitely agree that this is a problem which is of concern to all humanity.

(Mr. Nunez Portuondo, Cuba)

Having said that, however, we must note that we are faced with a different question when we consider draft resolutions containing suggestions for the establishment of an international scientific body for the purpose of carrying out the necessary studies and disseminating information on those studies throughout the world. We should be willing to support such suggestions only if we had an absolute guarantee that this information would be given to people all over the world, and not merely to people in a part of the world. Let us be frank. Everyone knows full well that there are certain systems of government under which no publicity whatever is allowed within the borders of the countries concerned. It is not our intention to discuss the question whether or not those governments have the right to operate in this manner. We are merely stating what is, I know, an open secret. It is obvious that if information on the dreadful effects of atomic radiation is disseminated only to the peoples of the West, and not to the peoples behind the Iron Curtain, what has been born as a good idea will become an instrument of political propaganda. The peoples receiving the information would become very fearful -- and, to a certain extent, they would have reason to fear -- whereas the peoples not receiving the information could easily be convinced to unleash a war of aggression because they would be unaware of the dangers of such a war. We would emphasize our belief that the intentions of the Governments of India and the United States are most praiseworthy. We wish to congratulate those Governments on the initiative they have taken. We must, however, reflect very carefully before we lend our support to proposals which, contrary to the intentions of the sponsors, might be turned into a weapon of propaganda and might benefit only certain peoples, rather than the peoples of the entire world. I feel that this question should be clarified: How is the information to be disseminated among the peoples of the world? I shall await a reply to that question before stating whether I shall vote for or against any draft resolutions that may be submitted.

Mr. RYCKMANS (Belgium) (interpretation from French): All member of this Committee will agree in recognizing the world-wide impact of the question on our agenda today. The Belgian delegation is happy to note that the speakers who have addressed the Committee so far have placed the problem on its true level -- that is, of the requirement of an objective, scientific study of the facts. It is no question of pronouncing ourselves for or against experimental explosions of atomic weapons, but a question of collating, integrating and disseminating all available information on the effects of radiation, whether such radiation is brought about by the military or peaceful uses of atomic energy.

This is a scientific problem and, as such, it should be dealt with outside and beyond any political considerations. When, in a future which may not be very near, men of science have determined what the effects of radiation are on the lives and safety of populations present and future, then statesmen should take over the problem and examine the measures to be adopted in order that the risks involved in the utilization of atomic energy shall be kept within acceptable limits. We have not reached that point yet. For the moment all that must be done is to establish the facts-- and to do so scientifically.

The Belgian delegation has a special interest in the question of ionizing radiation. Everyone is aware that for years almost all the radium used in the world was produced in Belgium from Congolese uranium. Belgian scientific circles, by the very force of circumstances, have had cause to study the effect of radiation on the human body as a problem of immediate practical importance. The evaluation of such risks was necessary to protect all those who might be exposed to such radiation, starting with the miners who extracted the ore and the workers who dealt with the chemical separation of radium, up to and including the scientific, technical and medical personnel who used and applied this radium and the patients on whose bodies it was used. Therefore, Belgian scientists have some competence in this field, and naturally the Belgian delegation has been following this debate with a keen interest.

We cannot at the moment pronounce ourselves on the character of the bodies that will deal with this problem. We have, so far, heard only suggestions of a rather general character. The text of a first draft resolution was, in fact,

(Mr. Ruyckmans, Belgium)

presented to us just a moment ago. In these circumstances, we reserve our right to revert to this issue once the Committee begins to tackle the various draft resolutions and once their sponsors have explained their preferences and their grounds for preferring certain formulations. But we should like now to emphasize the scientific and non-political character of the problem. In the selection of experts the determining element should be personal competence, not allegiance to any particular country or geographical region. The United States has proposed that a committee of States should be set up on the basis of rather wide geographical representation. Each of these States would designate one scientist to represent it on this committee. The United Kingdom supported this point of view on the theory that each scientist thus designated should be able to draw on the scientific experience and work of his country.

The argument is a weighty one, but I do not think that it is decisive. If it is desired, as the representative of the United States said, to mobilize the efforts of the greatest scientists from all over the world then the best thing to do would be to designate the world's best scientists rather than to designate countries in the hope that the greatest scientists will happen to be distributed according to the nationalities or citizenships of the countries concerned.

Should we follow the suggestion that studies should be made and that the Secretary-General and his staff should be asked to collect the necessary documentation, subject to the advice of the Advisory Committee which was set up for the purpose of running the Geneva Conference, and then ask a committee of experts to study that material? Well, any number of other formulas might be imagined. Perhaps an ad hoc committee of experts might be appointed -- on the basis of personal competence, not designation by governments. Or we might immediately set up a committee of experts, competent in the various aspects of the radiation problem, as proposed by Sweden, and ask that committee, rather than the Geneva Advisory Committee, to guide the work of the Secretariat on which conclusions would subsequently be based.

With regard to all these questions the Belgian delegation's opinions have not yet been crystallized. We shall make up our mind once we have heard all the views that no doubt will be expressed during this debate.

The CHAIRMAN: No other representative has indicated a desire to speak this evening. The Committee will note that there are to be two meetings tomorrow, one in the morning and the other in the afternoon, and I trust that we shall be able to press forward with the debate on this important subject as speedily as possible.

The meeting rose at 4.55 p.m.