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Chairman: Mr. Djalal ABDOLAH (Iran).

AGENDA ITEM 57

Effects of atomic radiation (A/3614 and Add.1, A/C.1/L.183, A/C.1/L.187, A/C.1/L.188) (continued)

1. Mr. BRUCAN (Romania) said that, while the study of atomic radiation fell essentially within the scope of a scientific body, the problem was not purely scientific and had aroused deep concern throughout the entire world, because the harmful effects of radiation were already being felt and threatened to become more serious.

2. The Czechoslovak delegation's initiative in submitting the question to the twelfth session of the General Assembly (A/3614 and Add.1) had been favourably received and several delegations had submitted observations and conclusions based on the opinions of eminent scientific authorities from all over the world. Those authorities considered that atomic radiation at its present level was having harmful biological effects and said that a rise in the level of such radiation would have serious consequences for both present and future generations.

3. A number of scientists, however, still believed that the present level of fall-out was negligible. Without awaiting the outcome of a scientific debate on the subject, the United States representative had presented the latter hypothesis as if it were a scientifically proven truth. Although the United States representative had asserted (894th meeting) that scientific truth was absolutely distinct from political issues, the Romanian delegation agreed with Mr. Warren Weaver, Chairman of the Committee on the Genetic Effects of Atomic Radiation of the United States National Academy of Sciences, who had stated that it was not surprising that some persons deeply and properly concerned over the military and political importance of nuclear weapons, regarded the danger from fall-out as negligible.

4. Obviously, nuclear test explosions were only one of the sources of atomic radiation. It was, however, quite natural that people should attach the greatest importance to that particular source and should be demanding the cessation of nuclear tests.

5. The Romanian delegation supported the Czechoslovak draft resolution (A/C.1/L.183) proposing the convening of a scientific conference on the efforts of atomic radiation. There was no incompatibility

between the work of the United Nations Scientific Committee on the Effects of Atomic Radiation and that of the proposed conference, for the two bodies could complement each other. In 1955, when the Scientific Committee had been set up, the information available on atomic radiation had been much more limited. The problem had now acquired worldwide importance and it was necessary to convene a conference to study it thoroughly and draw the necessary conclusions. The objection that such a conference might pursue propaganda aims was unfounded. It was not clear what kind of propaganda could be made or why the widest publicity should not be given to the opinions of scientists on a matter of such vital importance.

6. Mr. PRINCIPE DE OLIVEIRA (Brazil) said that no one denied or minimized the effects of atomic radiation nor should the dangers which might result from the combined effect of natural and man-produced radiation be disregarded. It was for the purpose of studying those problems that the United Nations had established the Scientific Committee to assemble and analyse all the available information. That Committee was pursuing its task conscientiously and had established close and useful co-operation with international agencies and of Governments of Member States; important individual contributions had also been made to its work. Under General Assembly resolution 913 (X), the Committee was to submit a report by 1 July 1958. That report should provide the United Nations with the best basis for a clear, realistic and comprehensive appraisal of the problems involved. Therefore, although the Czechoslovak draft resolution was well intended, it was difficult to see what useful purpose an international conference on the effects of atomic radiation would serve at the present time, for its terms of reference would be identical with those of the Scientific Committee.

7. The Brazilian delegation was not opposed to the idea of an international conference, but considered that the time was not ripe for a meeting of that sort. In the short time at its disposal, no conference could do a better job than the Scientific Committee. If the conclusions reached by the Committee were such as to call for international action, already existing international bodies, such as the International Atomic Energy Agency and the General Assembly, would be better qualified to take that action than a conference which, according to the Czechoslovak representative (894th meeting), was intended to be a forum where men of science would state their views.

8. However great the General Assembly's interest in a problem of such profound concern to world public opinion, it could not follow an unsystematic procedure and jeopardize the attainment of its objective. The United Nations should therefore trust the competent bodies which it had established to study the problem.

9. Mr. Krishna MENON (India) agreed with other representatives that controversies over the "cold war" and the suspension of nuclear tests should not be injected into the discussion. No doubt the First Committee had not achieved a final settlement of the problem of nuclear tests simply by adopting a draft resolution on the subject, but it could reopen the matter later, if necessary.

10. The Czechoslovak draft resolution and the draft resolution submitted by Argentina, Australia, Belgium, Brazil, France, Sweden, the United Kingdom and the United States of America (A/C.1/L.187) agreed on many points, but in their statements (894th meeting) the Czechoslovak and United States representatives had made several assertions of a political character. Furthermore, some of the conclusions put forward by the United States representative were not borne out by published scientific opinion. He had said, in effect, that it was not nuclear explosions that mattered most and had added that there was no cause for panic, because the radiation released by experimental explosions represented only a relatively minor hazard. However, the United States experts who had testified in May and June 1957 before the Special Subcommittee on Radiation of the United States Congress had felt that there was every reason to worry.

11. The United States representative had said that, even if nuclear tests were stopped immediately and for good throughout the world, it was questionable whether there would be a measurable, genetically harmful, radiation drop in future years. That argument was fallacious, for it was based on the assumption that there was a level of radiation which was genetically safe. There was a growing belief among the scientists of the world that there was no such safe level.

12. It was claimed that large numbers of medical and industrial machines emitted various types of equally harmful radiation. But it should not be forgotten that the number of people exposed to the effects of radio-active substances used in medicine was very small compared to those exposed to radiation from the fall-out caused by nuclear explosions. Furthermore, the former accepted exposure voluntarily, whereas the latter had no choice.

13. Mr. Wadsworth the United States representative, had emphasized that the United States was moving towards the development of nuclear weapons producing much less radio-active fall-out than earlier weapons. However, the amount of radiation released as a result of the triggering of those bombs by fission was very considerable. It would therefore not be correct to say that their effects were small.

14. The Indian delegation did not claim that nuclear weapons were the only causes of radio-activity in the world. The technical revolution taking place in industry, especially in the manufacture of steel, plastics, rubber, etc., naturally had consequences that must be taken into account. Governments had a duty to protect their citizens against the dangers inherent in that advance. It was for that purpose, moreover, that the United Nations had established the International Atomic Energy Agency. The question of the disposal of wastes and the question of the permissible quantum of radiation were thus acquiring great importance.

15. The United States representative had also re-

peated the statement he had made at the tenth session (773rd meeting) that there was in any case plenty of radio-activity in the world, arising from granite rocks, from cosmic rays, particularly at higher altitudes, from carbon and potassium in the human body, etc. All those facts were scientifically established, but the Indian delegation was concerned with the increase of radio-activity above normal levels, the determination of which the General Assembly had requested in its resolution 913 (X). He would recall that at the tenth session his delegation had requested (A/2949) that an item entitled "The dissemination of information on the effects of atomic radiation and on the effects of experimental explosions of thermonuclear bombs" should be included on the agenda. That item had been amalgamated with an item proposed by the United States (A/2931), with the result that the draft resolution submitted by the United States (A/C.1/L.138) had been amended during the discussion. The present draft resolution (A/C.1/L.187) incorporated a number of features of the previous text. When his delegation had requested the inclusion of the item in the agenda of the tenth session, it had pointed out (A/2949/Add.1) that no agreement had yet been reached on the degree of exposure to radio-activity which could be tolerated. The great majority of scientific opinion was contrary to what might be called the official view.

16. The two draft resolutions before the Committee did not differ greatly from each other except on the question of a conference. The United States representative had not expressed absolute opposition to a discussion. The penultimate paragraph of the preamble to the eight-Power draft resolution even referred to the second international conference on the peaceful uses of atomic energy, to be held in Geneva in September 1958, thus acknowledging the value of public discussion.

17. In his delegation's view, it would be desirable for the Committee to have before it a single text incorporating all the ideas contained in the two draft resolutions under review and some of the suggestions made by the Japanese delegation (896th meeting). At the same time, the terms of reference of the Scientific Committee might be enlarged; it might be asked to consolidate information on levels of natural background radiation, exposure to radiation from the industrial use of atomic energy, and contamination of environment by man-made radio-activity, including test explosions. The Secretary-General might be requested to consider, in consultation with that Committee, the question of widening activities in that field, taking into account the discussion and the proposals of the current session. The Secretary-General would be requested to report to the General Assembly at its thirteenth session.

18. His delegation did not go so far as the Czechoslovak delegation and was not asking for an immediate decision to call a conference. Its suggestions were intended to pave the way for the unanimous adoption of a draft resolution by the General Assembly, as at the tenth session. It would be extremely desirable for the eight Powers and the Czechoslovak delegation to make the necessary concessions, in order that that object might be achieved.

19. Mr. KISELEV (Byelorussian Soviet Socialist Republic) recalled that, as many representatives had

pointed out, radiation above a certain degree of intensity had harmful biological effects on unprotected human beings. It was known that a person exposed to a specific dose of radiation might contract radiation sickness, perhaps with fatal consequences. The possible effects of increased radioactivity in the world were grave, and the United Nations could not make light of the future of mankind.

20. Test explosions were becoming more and more numerous and, as a corollary, the radio-activity in the atmosphere and on the earth's surface was increasing. It was not surprising that a large number of scientists from most countries, supported by many eminent personalities, had sounded the alarm and warned against the dangers to humanity of such tests. In the circumstances, the draft resolution submitted by Czechoslovakia merited the most careful attention.

21. It was surprising that the representatives of many small countries had not taken part in the debate, as if the question did not concern them; that applied in particular to the Latin-American countries, with the exception of Brazil. The danger of fall-out, however, affected all parts of the world alike.

22. The representatives of the United States, the United Kingdom and France had tried to reassure the Committee. It was now fashionable in the United States to speak of "clean" bombs. That was what Mr. Wadsworth, the representative of the United States, had done, and Mr. Moch the French representative, had said (877th meeting) that the most powerful nuclear explosions released a thousand times less energy than the most powerful earthquakes and only just about as much as the tropical cyclones and that the danger did not therefore need to be taken into account at all. Yet, as Mr. Francis Perrin, the French High Commissioner for Atomic Energy, had said according to an article in the New York Post of 21 July 1957, a device which could cause large-scale destruction could not be called "clean". Mr. Kiselev quoted extracts from the United States Press, which admitted that a war fought with "clean" bombs would be just as destructive as any other war and that arguments based on such bombs were designed to prevent the conclusion of an agreement on the suspension of test explosions. He also quoted statements by many United States scientists, which had been reported in the Press and which admitted that the fall-out from explosions was extremely harmful to living organisms.

23. The accumulation of strontium-90 in bone was dangerous to the organism. Professor J.B.S. Haldane, the well-known United Kingdom biochemist, had said that the explosions which had so far taken place would cause the death or prevent the birth of 1.5 million human beings.

24. The danger from fall-out did not spare any geographical or political area. It was particularly serious, because the level of radio-activity would continue to rise in future; even if tests were discontinued immediately, the quantity of radio-active strontium in the atmosphere would exceed the maximum permissible level in five years' time.

25. The Japanese people were understandably especially concerned at the danger. Even now, 290,000 persons were known still to be suffering more or less seriously from radiation sickness contracted as a

result of the bombing of Nagasaki and Hiroshima. The New York Times had told the story of a boy of eleven who had died during the current year of bone cancer; his mother had been pregnant when she had gone to Hiroshima after the bombing in search of her parents. At both Hiroshima and Nagasaki, morbidity was abnormally high and a great many children were being born defective. The incidence of leukaemia was seven to ten times higher there than in the rest of Japan. Seven out of eleven children born shortly after the bombardment were not developing normally.

26. According to a group of United Kingdom scientists, the explosions had perhaps caused 50,000 cases of bone cancer throughout the world, and scientists were pointing out that, if the tests continued, the incidence of leukaemia would increase by 10,000 cases annually.

27. The outlook for future generations was gloomy. Any rise in radio-activity intensified harmful genetic mutations, which would considerably increase the number of children born with physical or mental defects. He supported his assertions by quoting various statements by scientists reported in the United States Press. According to a book by Schubert and Lapp, ^{1/} an increase in radiation of one tenth of 1 per cent was sufficient to endanger 2.5 million human beings and a 30 megaton hydrogen bomb could cause radio-active fall-out over an area as large as Massachusetts, Rhode Island and Connecticut combined.

28. Mr. Wadsworth had spoken of the evidence submitted by scientists to the Joint Committee on Atomic Energy of the United States Congress. Contrary to what he had said, that testimony proved the danger of the current tests to present and future generations. According to an article in the Christian Science Monitor of June 1957, the evidence had had one important result: no one any longer said that there was no danger. It was because the United States ruling circles opposed the suspension of tests that Mr. Wadsworth had been compelled to contradict that article.

29. Tests of nuclear weapons should be halted, at least until the extent of the danger due to atomic radiation and the contamination of air, water and soil had been established.

30. Two thousand two hundred scientists in the United States, 400 in Japan, 456 in the United Kingdom, 230 in France and hundreds of scientists in other countries were calling for a suspension of nuclear weapons tests. That was why the Czechoslovak draft resolution calling for the widest study and the broadest collection of views of as many scientists as possible could not be rejected. Of very great importance were the convocation of a scientific conference on the effects of atomic radiation and the submission by the Scientific Committee, in consultation with the International Atomic Energy Agency, of a report on the world level of radio-activity and on the effects of atomic radiation on man and his environment.

31. The idea of an international conference, it would be remembered, was not new. The Government of Switzerland had already considered making such a proposal. His delegation warmly supported the Czechoslovak draft resolution, which corresponded to the

^{1/} Jack Schubert and Ralph E. Lapp, Radiation: What It Is and How It Affects You (New York, Viking Press, 1957).

trend of world opinion, expressing its concern for the future of mankind. The draft resolution of the United States, the United Kingdom, France and other countries was completely inadequate in its present form.

32. The CHAIRMAN said that some of the Byelorussian representative's remarks had not been relevant to the subject under discussion; he urged succeeding speakers to speak strictly on the item.

33. Mr. MICHALOWSKI (Poland) said that the problem of atomic radiation had been at the centre of attention during the general debate in the plenary meetings of the General Assembly and the debates of the First Committee on disarmament. Everyone had favoured a thorough study of the question. Some speakers said that one should not yield to panic or lose one's head; for his part, he said he would speak on behalf of those who did not want to lose their lives.

34. He quoted from a letter addressed to the Special Sub-Committee on Radiation by five professors of Yale University.^{2/} Those scientists stressed the irreversible character of radiation: if in ten years' time it was found that the radiation had been excessive, the situation would be irremediable.

35. The argument about "clean" bombs was not very pertinent, for in essence it meant that for the sake of saving future generations the living generation was being exposed to grave risks. Mr. Warren Weaver had stated before the Sub-Committee that radio-active fall-out from current test explosions would account for some 6,000 of the 30 million handicapped babies to be born in the coming generation, while the strontium-90 released by past tests would cause leukaemia or bone cancer in 50,000 individuals.^{3/}

36. A virtual atomic war was being waged in the world. It had already caused the loss of many human lives, and it carried the risk of untold suffering to future generations.

37. It had been said that according to some scientists the increase in radio-activity was insignificant; but there were also scientists who maintained that there was no connexion between smoking and certain forms of cancer, whereas a clear causal nexus between the two had been established. It so happened that the scientists who refused to admit the nexus were employed by leading tobacco manufacturers. The situation in the case of radiation was similar, with the essential difference that the smoker only harmed himself. Professor Otto Hahn, president of the Max-Planck-Gesellschaft, who had been awarded a Nobel Prize in 1944 for having achieved the fission of the uranium atom, had stated on 7 November 1957, at Göttingen, that it was time to entrust talks to serious scientists, rather than political scientists.

38. The least that could be done by those who claimed that the continuation of the tests did not offer any danger was to discuss their point of view with other specialists. In the meantime, the explosions continued and, furthermore, other countries, such as France, were planning to conduct explosions. For-

merly, it had been the ambition of States to contribute to the arts, sciences and culture; the modern ambition seemed to be to share in the contamination of the atmosphere.

39. Many scientists had urged the banning of nuclear weapons tests. The First Committee had not adopted any resolution to that effect when discussing item 24, relating to disarmament, but that was no reason for remaining inactive. The Committee should extend to the utmost its knowledge of the effects of radiation on man and his environment.

40. The Scientific Committee was, of course, doing very useful work. Unfortunately, not all Member States were represented on that Committee, while in many countries scientific knowledge was such that their contribution was clearly indispensable. That being so the Polish delegation wholeheartedly supported the Czechoslovak draft resolution. The proposed conference would contribute to a better understanding of the dangers involved and would lead to the most appropriate measures in the prevailing situation.

41. On first glance, the eight-Power draft resolution was not incompatible with the Czechoslovak draft. Perhaps the two texts might be merged, with the inclusion of certain suggestions presented by the Japanese delegation. Such a draft resolution would obtain the unanimous support of the Committee. Since its discussion on disarmament had not led to agreement on the suspension of nuclear tests, the Committee had the duty to pay due attention to the problem of atomic radiation.

42. Mr. NASE (Albania) said that the question under discussion concerned the future of mankind. In spite of the public anxiety caused in the whole world by the constant increase in the level of radio-activity in the atmosphere as the result of nuclear explosions, and in spite of the general clamour for the discontinuance of tests, agreement had been obstructed by the negative attitude of the Western Powers. A great many scientists had warned the public and Governments of the inevitable contamination of the atmosphere, the water and the soil. Research carried out by Japanese and other scientists showed that the explosion of an atomic or hydrogen bomb produced a cloud whose radio-active elements, on being precipitated on the earth's surface, contaminated all vegetation. Strontium-90 and caesium-137 were especially dangerous since they contaminated the soil, were absorbed by plants and, through them, entered the animal organism. While the genetic consequences of atomic radiation were the cause of the greatest anxiety, for they had an inevitable influence on the frequency of mutations, atomic radiation produced equally harmful effects when it entered the organism by the respiratory tracts or the alimentary canal.

43. He cited a message of 4 June 1957 signed by 2,000 American scientists in which it was stated that every fresh nuclear test intensified radio-activity in all parts of the world and that every additional dose of radiation seriously threatened the health of mankind and penetrated into the cells of the organism, with the consequence that the number of abnormal children in future generations might increase. A Japanese scientist, Mr. Yoshio Hiyama, had stated that the effects of radio-active elements in the organism were extremely dangerous and that all the

^{2/}See United States Congress, Joint Committee on Atomic Energy, Special Subcommittee on Radiation, Hearings... on the Nature of Radioactive Fallout and its Effects on Man, 85th Congress, 1st Session, part 2 (Washington, Government Printing Office, 1957), pp. 1964-1965.

^{3/}*Ibid.*, p. 1292.

tests which added to the amount of strontium-90 in the air heightened the threat to human life. And Mr. Bragança, an Indian scientist, had said that the contamination of the atmosphere increased radio-activity dangerously and so tended to cause malignant tumours and genetic freaks. The passages he had quoted, together with the statements by the representatives of Czechoslovakia (894th and 896th meetings), the USSR (895th meeting) and the Byelorussian SSR, proved that the continuance of nuclear tests would have terrible consequences for health and heredity. A scientific conference organized under the auspices of the United Nations would permit scientists from all over the world to evaluate the dangers inherent in the continuance of nuclear tests.

44. The United States representative had said (894th meeting) that the conference might turn into a demonstration; that fear was groundless. The United Nations had the duty to tell the peoples of the world the truth about what was in store for them if they did not force the Governments of certain countries to agree to the prohibition of nuclear weapons and the discontinuance of nuclear tests. The pseudo-scientific notion that the "clean" bomb would not cause radio-active contamination would hardly impress the Committee.

45. For all those reasons, the Albanian delegation supported the Czechoslovak draft resolution. The General Assembly should adopt the draft for it was concerned with the maintenance of peace and with the development of international co-operation in the field upon which the future of mankind depended.

46. Mr. BELOVSKI (Yugoslavia) expressed approval of the initiative taken by the Czechoslovak delegation and of its draft resolution proposing the convening of an international conference to consider the question of atomic radiation. No one could deny the seriousness of the problem of atomic radiation, which demanded a general solution through United Nations action. That was why the United Nations had established the Scientific Committee. No doubt, the question would be included in the agenda of the Assembly's thirteenth session, after the Committee had submitted its report.

47. The Yugoslav delegation had stated its position on the question of nuclear tests during the earlier debate on disarmament (871st meeting). In an effort to avoid a revival of the spirit of controversy which had characterized the debate, the Yugoslav delegation would approach the problem of atomic radiation from an essentially practical point of view by taking account of the possibilities of reaching agreement on a question of general interest where fruitful co-operation had already taken place. It considered the convening of an international scientific conference useful because the proposal had the support of a number of Governments and of world public opinion. The conference, which would have at its disposal the data collected by the Scientific Committee and the second international conference on the peaceful uses of atomic energy, would produce useful and positive results. It would therefore be a mistake to oppose a conference of that type at a time when the United Nations should intensify its efforts to find a solution to the problem of atomic radiation. The Yugoslav delegation thought it possible to reconcile the different points of view. A rapprochement of views would be most desirable, not only by reason of its immediate practical effects,

but also as a step forward towards the creation of a more favourable atmosphere, after the division manifested over the problem of disarmament. In addition, it would enable the General Assembly to take new measures for the solution of the problem of atomic radiation at its thirteenth session.

48. Mr. TARABANOV (Bulgaria) said that the advent of the atomic era had stimulated hopes for a great advance in the well-being of mankind. Unfortunately, that era had been ushered in by two explosions which had had tragic after-effects in the target area. And it had since been realized that atomic explosions had other very serious consequences throughout the world.

49. In view of that danger, the General Assembly had, by its resolution 913 (X), established the Scientific Committee and had requested it to report on scientific observations relevant to the effects of atomic radiation upon man and his environment. The great development of the use of nuclear energy in recent years was steadily raising the level of radio-activity in the world. The danger which that rise represented was stressed by a great many scientists and scientific institutions. In that connexion, he cited the report prepared for the Scientific Committee by the Study Group on the Effect of Radiation on Human Heredity assembled by the World Health Organization (WHO) ^{4/} and the paper submitted to the Study Group by Professor R.M. Sievert of the Institute of Radiophysics, Karolinska Hospital, Stockholm. ^{5/} The WHO Study Group had unanimously put forward the following conclusions: the well-being of descendants of the present generation was threatened by developments in the use of nuclear energy and of sources of radiation, in other words by radiation from both natural and man-made sources. Radiation had been demonstrated to be one of the agents which produced mutation in a wide range of organisms, from bacteria to mammals. Additional mutation produced in man would be harmful to individuals and to their descendants. There were many gaps in knowledge of the effects of radiation, and consequently every possible step had to be taken to reduce the exposure of man to radiation and to understand the effects of such exposure. There were strong grounds for believing that most genetic effects were additive and might come to light only after several generations.

50. Professor Sievert had drawn attention to the quantities of radio-active products scattered throughout the world as a result of the testing of atomic weapons. While noting that the WHO Study Group was concerned with the peaceful use of atomic energy, Professor Sievert had pointed out that the problems in the field of artificial radio-active elements distributed in nature were at the present time mainly related to fall-out from tests of atomic weapons.

51. It was therefore extremely regrettable that there should have been a tendency in the disarmament discussions to minimize the gravity of the effects of atomic radiation. That tendency had been exemplified in the statement of the French representative, who, in the course of a scientific explanation on the problem of radio-activity due to strontium-90, had said (895th meeting) that, while such radio-activity increased rapidly at first, it subsequently decreased

^{4/}Ibid., p. 1731 et seq.

^{5/}Ibid., pp. 1761-1777.

in an exponential curve to a point where—it had been thought—it would finally fall beneath the level of natural radio-activity. Unfortunately, such had not been the case, since it appeared that the radiation, so far from diminishing, was gradually but steadily increasing.

52. In any case, all scientists recognized that any increase in radio-activity, however small, caused increased mutation and that theoretically there was no maximum tolerable dose. The limits of endurance of mankind were as yet unknown. The lack of knowledge might have tragic consequences if prompt and effective steps were not taken to check any further increase in atmospheric radio-activity.

53. It was absurd to point to the danger from luminous watch-dials, while at the same time the atmosphere was being polluted in an uncontrolled manner by the test explosion of nuclear weapons.

54. It would be comparatively easy to reduce or even eliminate the hazard from radiation used for peaceful purposes, but the same was not true of radiation resulting from the testing of atomic weapons. The United Nations could therefore no longer remain indifferent to that question.

55. Since the Scientific Committee had been set up, several new events had filled the peoples and the scientists of the world with justifiable anxiety. The scientists called for co-ordination of the efforts of every country, every scientist and every scientific institute, and urged that an international conference should be convened at which scientists of the whole world could reach the most accurate possible conclusions regarding the dangers of atomic radiation and consider the effective steps that Governments should take before it was too late. It was the duty of the United Nations to convene such a conference, and it was important that it should take that decision during the current session, by adopting the Czechoslovak draft resolution.

56. It would be wrong of the General Assembly to note at the next session, when discussing the report of the Scientific Committee, that many questions were still of a controversial nature and that a number of facts and aspects of the problem had not yet been sufficiently studied, and to decide to extend the Committee's terms of reference by giving it more or less specific tasks.

57. Mr. MOCH (France) said that the representative of the Byelorussian SSR had only partly quoted the statement he (Mr. Moch) had made at the 877th meeting, having omitted the sentence: "Nor should we fear the possibility of chain reactions destroying the planet as the result of peace-time test explosions. All this has been scientifically proved."⁶ That sentence immediately preceded the one quoted by the Byelorussian representative. The impression might be conveyed that he (Mr. Moch) had said that the effects of atomic radiation were negligible. The words "Therefore their danger need not be taken into account at all,"⁶ did not apply to the effects of atomic radiation, but to the possibility of chain reactions resulting from some peace-time test explosions.

58. With regard to Mr. Perrin's article published in the Paris newspaper *L'Express*, which had been

reprinted in *The Washington Post* and *Times Herald*, he said that he was familiar with the article and, like everyone else in France, shared Mr. Perrin's views. One should not play with words. The word "clean" had been given a specific meaning, synonymous with the expression "non-radiation-producing". Obviously, no weapon of mass destruction was morally "clean". The word "clean" was hardly the right word in that context or in any reference to lethal weapons.

59. The representative of Bulgaria had likewise quoted from his (Mr. Moch's) statement and drawn conclusions which had not been intended. The activity of a specific quantity of radio-active substance diminished in time, according to the well-known exponential curve, ultimately to vanishing point. Hence, while it was true that a series of tests produced a progressive increase in radio-activity, the aggregate effect depended upon the number, rate and nature of the explosions because two contradictory phenomena were involved: the nuclear explosions, which abruptly stepped up radio-activity, and the radio-active life of the bodies, which slowly diminished. If there were many explosions, the radio-active mean increased. If none took place after a certain time, radio-activity diminished and, in time, disappeared altogether. What would happen in an intermediate situation could not be predicted. There was no way of telling whether there would be an average increase or an average decrease.

60. A conference of the kind proposed by the Czechoslovak delegation would not lessen the danger. That could only be done through a discontinuance of nuclear test explosions, which would not be difficult if discontinuance were linked to the cessation of the production of fissionable materials for military purposes and to the initiation of steps to convert stockpiles.

61. Mr. ROCHA (Colombia), speaking in reply to the Byelorussian representative who had expressed surprise at the silence of the Latin-American delegations other than that of Brazil, said that all the Latin-American delegations had spoken during the debate on disarmament and stated their position on the related item now under consideration. Moreover, Argentina and Brazil represented the Latin-American countries on the Scientific Committee and were making a useful contribution to the work of that Committee.

62. The Latin-American countries were fully aware of the danger of atomic radiation and were not indifferent to it. Hence, they favoured the conversion of stockpiles of fissionable materials constituted for military purposes to peaceful uses. With regard to the danger of peace-time atomic radiation, he said that the Colombian delegation supported the eight-Power draft resolution.

63. Mr. LALL (India) said that, if he had correctly understood the statements made by the representative of France, Mr. Moch had contended that a bomb was "clean" if it brought destruction by means other than radiation, in other words that any bomb was "clean" if it did not cause destruction through radio-activity.

64. Mr. MOCH (France) said that the statement attributed to him by the representative of India was exactly the opposite of what he had said, which was that no weapon of mass destruction, whatever the method employed for causing death, could be termed

⁶/Translation of the provisional verbatim record; the printed record exists only in summary form.

"clean"; that was true even of a weapon which took a single life, and it was wrong to misconstrue the word "clean".

65. Mr. LALL (India), referring again to the French representative's remarks, pointed out that Mr. Moch seemed to be saying that the intention was to produce bombs with less and less radio-activity so that their destructive force would derive not from their radio-activity, but from the explosion. Two points arose in that connexion. First, the fusion bomb was set off by a fission bomb and, in view of the large size of the fusion bomb, the releasing device itself produced greater radio-activity than the fission bombs which had been dropped on Hiroshima and Nagasaki. Secondly, the fusion element in a fission-fusion bomb produced both long-lived and short-lived radio-activity, depending on the area in which it was used. For example, if a fusion bomb were dropped on New York, where

large quantities of steel were present, the bomb would produce a tremendous amount of long-lived radio-activity.

66. The Indian delegation was therefore unable to understand the definition of "clean" bombs, because first, the fission "trigger" in a fusion bomb was very large and produced a great quantity of strontium-90 and secondly, the fusion element in the bomb itself would produce a great deal of long-lived radio-activity if, for example, there was a considerable amount of steel or cobalt in the area.

67. The CHAIRMAN said that the general debate was closed. He hoped that the sponsors of the various draft resolutions and amendments would confer with a view to producing a single draft which could be adopted unanimously.

The meeting rose at 6.20 p.m.