

**CONFERENCE OF THE EIGHTEEN-NATION COMMITTEE
ON DISARMAMENT**

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ENGLISH

FINAL VERBATIM RECORD OF THE THREE HUNDRED AND TWENTIETH MEETING

held at the Palais des Nations, Geneva,
on Tuesday, 8 August 1967, at 10.30 a.m.

Chairman:

Mr. A. A. ROSHCHIN

(Union of Soviet Socialist
Republics)

GE.67-15754

PRESENT AT THE TABLE

<u>Brazil:</u>	Mr. C.A. de SOUZA e SILVA Mr. A. da COSTA GUIMARAES
<u>Bulgaria:</u>	Mr. K. CHRISTOV Mr. B. KONSTANTINOV Mr. T. DAMIANOV
<u>Burma:</u>	U KYAW MIN
<u>Canada:</u>	Mr. E.L.M. BURNS Mr. C.J. MARSHALL Mr. J.R. MORDEN Mr. A. BERNIER
<u>Czechoslovakia:</u>	Mr. P. WINKLER Mr. V. VAJNAR Mr. J. STRUCKA
<u>Ethiopia:</u>	Mr. A. ZELLEKE
<u>India:</u>	Mr. V.C. TRIVEDI Mr. K.P. JAIN
<u>Italy:</u>	Mr. R. CARACCIOLO Mr. G.P. TOZZOLI Mr. E. FRANCO Mr. F. SORO
<u>Mexico:</u>	Miss E. AGUIRRE
<u>Nigeria:</u>	Mr. B.O. TONWE
<u>Poland:</u>	Mr. J. GOLDBLAT Mr. E. STANIEWSKI

Romania:

Mr. N. ECOBESCO
Mr. O. IONESCO
Mr. C. GEORGESCO
Mr. A. COROIANU

Sweden:

Mr. A. EDELSTAM
Mr. I. VIRGIN
Mr. R. BOMAN
Mr. J. PRAWITZ

Union of Soviet Socialist
Republics:

Mr. A.A. ROSHCHIN
Mr. V.P. SUSLOV
Mr. V.V. SHUSTOV

United Arab Republic:

Mr. H. KHALLAF
Mr. O. SIRRY

United Kingdom:

Sir Harold BEELEY
Mr. I.F. PORTER
Mr. R.I.T. CROMARTIE

United States of America:

Mr. W.C. FOSTER
Mr. G. BUNN
Mr. C. GLEYSTEN
Mr. G. BREAN

Special Representative of the
Secretary-General:

Mr. D. PROTITCH

Deputy Special Representative
of the Secretary-General:

Mr. W. EPSTEIN

1. The CHAIRMAN (Union of Soviet Socialist Republics)(translation from Russian): I declare open the 320th plenary meeting of the Conference of the Eighteen-Nation Committee on Disarmament.
2. Mr. ECOBESCO (Romania)(translation from French): After more than five years of negotiations the agenda of our Conference is still waiting for us with its whole set of unresolved problems. I say "unresolved problems" because our debates have not resulted in the adoption of agreements or concrete measures; and that is true in regard to both general disarmament and collateral measures.
3. As in the past, as we all know, the essential task of the Committee -- the task, in fact, which gave rise to the very establishment of this body -- remains general disarmament and the elaboration of a treaty in that field. The General Assembly of the United Nations, since its adoption in 1959 of the well-known resolution 1378 (XIV), has not ceased to reiterate every year, with a sense of continuity and with increased conviction, the demand for the continuation of unflinching efforts to arrive at an agreement on general disarmament. At each session of the General Assembly, including that of 1966, the United Nations has not failed to remind our Committee that its primary mandate is to work out an agreement on general and complete disarmament.
4. It is therefore quite natural to ask the question: what point has our Committee reached in carrying out the clear mandate given to it by the United Nations?
5. A retrospective look at the negotiations in the Eighteen-Nation Committee reveals a picture which is not at all encouraging. Not only has no practical measure of disarmament been achieved, but during recent years the efforts directed towards general disarmament have continually slackened. Whereas the reports submitted to the General Assembly in 1962 showed that most of the meetings had been devoted to the consideration of general disarmament, the reports drawn up in the last few years, and particularly in 1965 and 1966, show that its place in our Committee's debates has been greatly reduced, priority being given to other measures of lesser scope and of lesser effect. And if we consider the situation brought about this year, we come to the conclusion that the Committee will probably have to report to the Assembly that it has not devoted one special meeting to the principal question which is before it.

(Mr. Ecobesco, Romania)

6. Does that imply that, eight years after the adoption of the resolution on general disarmament, the international situation has ceased to involve the serious dangers to peace which existed at that time? Have any steps been taken during the whole of that period with a view to restraining the arms race and reducing existing stocks of weapons? In short, have any measures been adopted which would justify relaxing in any way the efforts of our Committee towards general disarmament?

7. Unfortunately, the reply to all these questions is not in the affirmative. Nothing of the kind has happened in the world. On the contrary, during the whole of that period new hotbeds of conflict have come into being and the arms race has continued unimpeded its ascending spiral, reaching truly fantastic proportions. Mankind is now profoundly perturbed by the fact that in various parts of the world the flames of war are alight, causing serious material destruction and loss of human lives. The possibility of the extension of war, the outbreak of a devastating world conflagration, is by no means precluded.

8. That is precisely why the elimination of war as a means of settling conflicts between States is the cardinal question which dominates the whole problem of the organization of peace. If one is convinced that in relations between States law -- law and not force -- must prevail, then effective measures must be taken to destroy the actual means of waging war. It logically follows that the struggle against war should be today the primary obligation of the peoples, compelling all States and all governments to work unremittingly, with ever-increasing energy and perseverance, to extinguish the hotbeds of war, to frustrate the plans of aggressive circles, and to safeguard the peace and security of the peoples.

9. However unbelievable it may be, it is nevertheless an actual fact that today, when the conquests of science and technology put within man's reach immense means and possibilities of enriching his material and spiritual conditions of life, mankind is wasting with obstinate shortsightedness truly astronomical sums -- according to some statistics more than \$150,000 million a year -- on an utterly irrational purpose, from which an unprecedented danger to modern civilization could arise at any moment.

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With the fabulous sums spent on means of destruction there has been created a military arsenal -- particularly of nuclear weapons -- capable of annihilating completely, indeed a hundred times over, vast areas of the world.

10. Today the "standard" nuclear weapon, the twenty-megaton super-bomb, releases explosive power a thousand times as great as that of the bomb dropped on Hiroshima on 6 August 1945, and could wipe the greatest cities of the world off the face of the earth. Such a weapon has a destructive force three times as great as that of all the bombs released during the six years of the Second World War.

11. A recent calculation made by nuclear scientists with regard to the size of existing nuclear arsenals shows quite clearly the magnitude of the catastrophe which a nuclear war would be. The equation is as follows: if a bomb equivalent to the explosive power used throughout the six years of the Second World War were exploded every day, it would take 52,000 days, or more than 140 years, to exhaust the stocks of nuclear weapons existing in the world today. In other words, the amount of nuclear explosives now in existence is 52,000 times as great as the total explosive force used during the last world war. That is a fact to which one cannot close one's eyes and which cannot be evaded. It is a fact which must never escape the attention of this Committee.

12. The danger of a devastating war which looms over mankind, generated and accentuated by the spiral of the nuclear arms race, clearly indicates the path to be followed in the disarmament negotiations. In order to halt the arms race and reverse its direction, the pace of the negotiations and of the political efforts designed to sustain it must exceed the pace of the arms race.

13. The Socialist Republic of Romania, for its part, has declared itself, and continues to declare itself, firmly in favour of general disarmament as a sure means of eliminating the threat of war and ensuring a durable peace in the world. In the opinion of the Romanian delegation, the efforts directed towards disarmament must be pursued with conviction and tenacity, since disarmament alone can provide an adequate answer to the danger represented by the arms race and to the problems raised by the existence of nuclear weapons and the modern technology of armaments. General

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disarmament -- and, above all, its principal component nuclear disarmament -- is the best answer to the need to ensure equal conditions of peace and security for all countries. It can be stated that it is precisely in the conditions of general disarmament that the appropriate conditions will have been created to ensure the complete elimination, from the relations between States, of the "law of force", and the complete triumph of the force of law, justice and equity.

14. A gradual advance towards the realization of humanity's yearnings for general disarmament would have the effect of releasing the immense material resources so necessary for accelerating the process of development in which many countries and peoples are engaged today. Through a reduction in military expenditure, part of the resources thus released could be devoted to supporting the efforts made by the less-developed countries to achieve social and economic progress. Moreover, the accomplishment of disarmament would bring about the necessary conditions for the thousands and thousands of scientists, research workers and experts whose activities are now concerned with the creation of means of destruction fully to devote their intelligence, their knowledge and their creative powers to the development of the production of material and spiritual benefits, to the progress of contemporary society, to the well-being of the peoples.

15. In this Committee and at the sessions of the United Nations General Assembly, Romania has declared itself in favour of the implementation of measures which, though of lesser scope in disarmament, would have beneficial effects on the relations between States and on the international situation in general and would lessen the danger of war. We believe that, alongside consideration of the question of general disarmament, our Committee should continue negotiations on collateral measures, because everyone knows that the achievement of agreements in that field would facilitate its efforts to attain the main objective.

16. In the opinion of the Romanian delegation, the banning of the use of nuclear weapons, though a first step towards the total elimination of those weapons of mass destruction, is indispensable as a measure of unquestionable importance having

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manifold implications for the whole of the disarmament problems and favourable repercussions on the efforts aimed at finally eliminating the risk of a new war.

17. The establishment of denuclearized zones in various parts of the world would have a similar effect.

18. Among the measures which could directly influence the disarmament process, the Romanian Government includes the elimination of foreign military bases from all continents or countries where they are installed, and the withdrawal of foreign troops within their national borders. The negative effects which the existence of these bases and troops has on the international situation and directly on the countries where they are installed have been mentioned time and again in this Committee, at sessions of the General Assembly, and in other international bodies. The result of a certain context in international relations now completely outdated, military bases and armed forces on the territories of foreign States are an obsolete element in international relations which is harmful to the continuous process of improvement of relations between States.

19. Romania, together with the other socialist countries which took part in the Bucharest Conference held in that city in July 1966, considers that it is time for all military blocs to be liquidated, while affirming the determination that, parallel with the liquidation of the North Atlantic Treaty, measures should be taken to put an end to the existence of the Warsaw Pact. We consider that in the place of military groupings -- an out-of-date and anachronistic institution -- it is appropriate to establish and develop relations founded on mutual confidence and esteem, on respect for national sovereignty and independence, on non-interference in the internal affairs of States, on full equality in law and on multilateral co-operation among independent nations.

20. Life itself in its natural evolution constrains States, in the interest of the development of their relations, to pass beyond the barriers in the way of free and unobstructed co-operation between countries, try to find numerous points of common interest and establish links calculated to stimulate a rapid and continuous flow of material and spiritual values, for the benefit of all nations.

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21. It is said, rightly, that each scientific discovery, while resolving an old problem, at the same time gives rise to many new problems which also require solutions. That proposition has perhaps never been so plainly demonstrated as by nuclear energy. While it is true that that source of energy can be used to inflict on humanity losses and destruction without precedent in history, it is none the less true that its use for peaceful purposes opens up for mankind unique prospects for reaching new levels of civilization.

22. The ambivalent character of nuclear energy -- a destructive force and the same time a force for human progress -- requires as the only logical and rational solution the banning of the use of atomic weapons, the cessation of their manufacture and the total liquidation of existing stocks. Romania has declared itself, and continues to declare itself, most resolutely in favour of that rational solution.

23. The road leading to that objective could be smoothed by a whole series of transitional partial measures designed to contribute to the effective reduction of the nuclear danger. In the opinion of the Romanian delegation, a particularly important measure would be the banning of the proliferation of nuclear weapons -- a problem on which the attention of public opinion is focused at present and in regard to which our Committee has been instructed by the United Nations General Assembly to negotiate a draft treaty.

24. It is not my intention to quote all the resolutions of the General Assembly which determine the mandate given to our Committee in that regard. Nevertheless, two of them particularly call for our attention, namely, resolution 2028 (XX) of 19 November 1965 (ENDC/161) and 2153-A (XXI) of 17 November 1966 (ENDC/185). The first lays down the framework and stipulates clearly the essential co-ordinates for a treaty on non-proliferation. The second includes not only a reaffirmation but also a necessary complement to the first. The principles embodied in resolution 2028 (XX), seen as a whole, should constantly guide our negotiations, in which all of us are called upon to participate. Conformity with those principles constitutes, according to the profound conviction of the Romanian delegation, the fundamental criterion for estimating the value of any text, any draft treaty on the non-proliferation of nuclear weapons.

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25. As those principles have often been adduced in this forum -- either as a whole or separately -- we wish only to mention two of them which in our view are of particular interest.

26. First, the postulate contained in paragraph 2(c), under the terms of which the treaty on the non-proliferation of nuclear weapons "should be a step towards the achievement of general and complete disarmament and, more particularly, nuclear disarmament". (ENDC/161) That means -- as indeed several delegations have often stressed in this Committee, and not only in this Committee -- that non-proliferation should not be conceived of as an end in itself. On the contrary, it should be envisaged as a step in a precise direction, namely general disarmament and, above all, nuclear disarmament.

27. The other principle, embodied in paragraph 2(b), stipulates that the treaty "should embody an acceptable balance of mutual responsibilities and obligations of the nuclear and non-nuclear Powers". (ibid.) That implies, and in a very precise way, the character of equivalence of the responsibilities and obligations assumed by the parties to the treaty, the symmetry of the legal relations which this treaty would create. This is an altogether normal consequence, because any treaty which would unilaterally impose obligations solely on the States not possessing nuclear weapons would not meet the legitimate requirement of the peoples for a guarantee of their equal right to peace and security.

28. In order to conform to these requirements, which are of fundamental importance, the non-proliferation of nuclear weapons should be part of a whole series of measures whose final objective -- which is both logical and necessary -- would be nuclear disarmament.

29. Non-proliferation, unless accompanied by precise, firm and effective measures taken by all States to halt the manufacture of nuclear weapons, ban underground tests for military purposes, and reduce and finally liquidate existing stocks of nuclear weapons, would not only fail to ensure progress along the road to the elimination of the danger of the thermonuclear war but would perpetrate

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that danger indefinitely. In our opinion non-dissemination, if not accompanied by such measures, would only legalize the division of the world into nuclear and non-nuclear States, and would only permit the nuclear Powers to increase their atomic arsenal further and to continue to improve the technology of nuclear weapons.

30. The long-term consequences of such a situation will, I believe, escape nobody. That is precisely why it is essential that, side by side with the obligation assumed by the non-nuclear Powers to renounce atomic weapons, the non-proliferation treaty should contain precise obligations binding the States possessing nuclear weapons to adopt measures for the banning and destruction of these weapons.

31. If one also remembers that non-proliferation implies the obligation of the States not possessing nuclear weapons not to acquire them, it is altogether legitimate and necessary that, until the existing nuclear weapons are completely eliminated, those States should enjoy guarantees of security. That presupposes above all the firm obligation of the nuclear Powers not to use such weapons against States which do not possess any, and not in any case or in any circumstance to threaten them with their use. It is beyond dispute that the effectiveness and power of attraction of a non-proliferation treaty depend upon the extent to which it will offer to all the signatory States an enhanced degree of security.

32. Another aspect which must be taken into account in negotiating the non-proliferation treaty is that of the use of nuclear energy for peaceful purposes. At present no country in the world is unaware of the grandiose possibilities for its economy opened by the application of nuclear energy in various sectors of production or research. This is only natural because in our era, which is characterized by an all-round scientific and technical revolution and by an irreversible movement of mankind towards progress and civilization, the influence exercised by science and technology -- and above all by the conquests of nuclear science and technology -- on the economic and social development of a country is continually increasing.

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33. It is a generally valid truth that science and technology constitute the driving force of economic prosperity. Prosperity and the well-being of peoples are, like peace, indivisible. Hence the imperative necessity that the non-proliferation agreement should ensure unlimited rights and opportunities, for all countries without any discrimination, to undertake scientific research in nuclear energy and to utilize the conquests of science for their peaceful development. Any formula designed to hinder access to the peaceful use of atomic energy would condemn non-nuclear countries to scientific and industrial backwardness and seriously prejudice the right of all peoples to benefit fully from the great achievements of modern civilization. No nation could accept a situation which would be tantamount to curbing its progress in this dominating field of science and technology.

34. Lastly, an important condition of the non-proliferation agreement is that it should not institute forms of international control which would encroach upon the sovereignty and national independence of States, or establish relations of dependence of non-nuclear on nuclear countries.

35. To sum up the foregoing, the position of Romania towards a draft treaty on the non-proliferation of nuclear weapons is expressed by the requirement that it should fulfil four principal conditions:

The treaty must be regarded as an integral part of a system of measures designed to lead to the elimination of nuclear weapons;

The treaty must provide equal guarantees for the security of all States, large or small, nuclear or non-nuclear;

The treaty must not limit the use, by all, of nuclear energy for peaceful purposes; it must on the contrary ensure unlimited rights and opportunities for all States to undertake research in this field and to utilize the conquests of nuclear science for their peaceful development;

The treaty must establish a precise and equitable control system, based on the principle of equality among States, to which all countries must be subjected to the same extent and which opens no loop-holes for interference in the internal affairs of other States.

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36. Mr. Nicolae Ceausesco, Secretary-General of the Central Committee of the Romanian Communist Party, declared in the statement on Romania's foreign policy that he made on 24 July at a meeting of the National Assembly that --

"Non-proliferation of atomic weapons should lead to the ending of the division of the world into nuclear and non-nuclear countries, to the strengthening of equality among States, and to a real lessening of the danger of war. If the non-proliferation treaty meets these fundamental requirements, it could in fact constitute an instrument for the strengthening of international peace and security and for the protection of the lives of the peoples."

37. Remembering that this concerns all peoples, we consider that all the countries of the world should participate in the debates on such measures, since the absence of certain countries -- particularly some that possess nuclear weapons -- is likely to endanger the success of non-proliferation. Romania considers it essential to pursue the efforts aimed at achieving a treaty on the non-proliferation of nuclear weapons, a treaty that will be in keeping with the interests of the general progress of humanity and of international peace and security.

38. Historic evolution as a whole proves that only those agreements are durable which are based on the fundamental principles of international law. Strict conformity with the fundamental standards of international legality and morality appears as an imperative condition, especially of disarmament agreements and measures, which by their consequences directly affect the vital interests of States and of peoples.

39. In conformity with contemporary international law, the existence and the vital interests of a State are not and should not be at the mercy of others; its existence, its sovereignty, its national independence and its personality should not be mere legal or political desiderata; they are and must always constitute a tangible, inalienable and indivisible reality.

40. That being so, and since war -- above all, nuclear war -- by its very nature and by its extremely destructive consequences involves the most vital interests of States, it is incontestable that the fundamental right of every State and every people to existence and their legitimate desire to live and develop in conditions of complete

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security are inseparable. Hence the absolute necessity that agreements concluded on disarmament should have as their starting-point and goal the destruction of existing armaments and the elimination first of all of nuclear weapons.

41. In order to be durable and stable, disarmament agreements should correspond to the aspirations and fundamental interests -- both immediate and long-term -- of all States, large or small, and should ensure clear prospects of peaceful co-existence among peoples and promote the progress and development of all nations without any exception.

42. This leads me to consider the responsibilities incumbent upon the various States in the negotiation and implementation of disarmament measures and the role of the small and middle-sized States in international life, also in respect of the problems with which this Committee is concerned. In this connexion I should like to refer again to the statement by Mr. Nicolae Ceausescu which I have just mentioned, in which he said:

"The increasingly intensive participation of the small and middle-sized countries in the solution of the problems of international life is one of the characteristics of the era in which we live. The concept according to which the fate of mankind is exclusively in the hands of the great Powers no longer corresponds to the new conditions of social development. The facts show that the settlement of international disputes can no longer be decided solely by the great Powers; in these days it depends upon the active co-operation of all the States in the world.

"Of course, on account of their potential and their influence, the great Powers bear a heavy responsibility for the fate of peace and can make an essential contribution to the prevention of a new war, to the safeguarding of peace and international co-operation. Their positive role in world development is directly proportional to the responsibility which they show in defending the standards of international justice and in promoting equality of rights among States, the principle of the independence and sovereignty of peoples, and non-interference in internal affairs. At the same time it must be pointed out that disregard or underestimation of the contribution which the small or middle-sized States can make to

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international life renders more difficult the solution of existing problems and harms the cause of peace and co-operation between peoples...

"It can be stated that at the present time each State - each nation, large or small - bears responsibility for the fate of peace and is bound to make its active contribution to the prevention of a new war, to the relaxation of international tension, and to the strengthening of friendship and co-operation between peoples."

43. Loyalty to the fundamental principles and standards of law to which I have just referred is also essential in disarmament negotiations. These are a complex phenomenon of the international political reality, having multiple aspects and implications, and presupposing, as an important condition for their successful conclusion the adherence of all the participants to the legal rules intended to govern them.

44. The strict observance of these standards by everyone, together with the determination of all to persevere in carrying out to the full the mandate entrusted to this Committee, gives the negotiations a clear prospect, a precise aim. The attitude of right understanding of the interests of all countries, combined with due respect for the positions defended by each of them, ensures the atmosphere of confidence so necessary for the success of the negotiations. Sympathy for the points of view expressed and receptiveness to the arguments put forward give these negotiations flexibility and authenticity.

45. The fruitful discussion of measures aimed at bringing about a situation in which violence and war would be eliminated for ever demands that the conduct of all States should be such as to exclude recourse to violence and war. However, the present international situation involves events which cannot fail to have a negative influence on our negotiations.

46. The war of aggression waged by the United States of America against the people of Viet-Nam, the intensification of the bombardment of the Democratic Republic of Viet-Nam, constitute the most serious danger to peace at the present time. The immediate and unconditional cessation of the bombardment of the Democratic Republic of Viet-Nam, the halting of aggression and respect for the sacred right of the Viet-Nameese people to decide their own future themselves without any interference from outside are called for as a matter of the utmost necessity and urgency.

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47. It is the profound conviction of the Romanian Government that the cessation of the war in Viet-Nam would have beneficial effects on the international situation as a whole and would contribute to the normalization and development of relations between States and to the consolidation of peace in the world, while at the same time facilitating the search for solutions to other international problems.

48. The policy of peace and broad international co-operation promoted unremittingly by the Government of the Socialist Republic of Romania has for its fundamental starting-point the fact that the Romanian people are engaged in a vast task of building and raising their standard of living. Our people, like other peoples, are anxious that conditions of peace and security shall be ensured which will enable them to benefit fully from the fruits of their labour and the advantages of modern civilization. Therein lies also the unswerving attachment of Romania to the cause of disarmament.

49. The Romanian delegation to this Committee will make its contribution, within the limits of its possibilities, to the efforts to find solutions likely to facilitate the achievement of just and durable disarmament agreements serving the interests of all peoples and of world peace.

50. Mr. FOSTER (United States of America): Today I should like to comment further on the subject of a comprehensive ban on nuclear weapon tests. As we have stated repeatedly, the United States Government believes that an adequately-verified treaty in this area would enhance the security of all nations. As far as my Government is concerned, the prime obstacle preventing the achievement of a treaty is lack of agreement concerning what constitutes adequate verification. On the basis of information available to us, we have concluded that national means by themselves would not provide effective assurance that treaty obligations were being observed. We should, of course, welcome any data which indicated that national means are effective or which pointed out a possibly rewarding line of research.

51. We welcome particularly the document (ENDC/191) and statements (ENDC/PV.309, 315) recently presented by the Swedish delegation as a significant contribution to our discussion. Our study of this material continues. We agree in principle that the approach outlined by the Swedish delegation is a useful one. We are also pleased that the representative of the Soviet Union has apparently endorsed this general method

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of analysis (ENDC/PV.313, paras. 17 et seq.), since we too believe that the problem of determining the required number of on-site inspections is one that is susceptible of technical analysis.

52. However, as Mr. Edelstam noted, (ENDC/PV.315, para 12), the conclusions which he reached concerning verification requirements depend upon the numerical values which are assigned to the parameters appearing in the formula. Other investigators might assign other values which would lead to other results. For example, the question of whether a 10 per cent chance of detection provides a sufficient deterrent to a violator will be dependent on the gains which might accrue from the tests and the penalties for being apprehended in a violation. Moreover, we might assign different values to the parameters describing the number of tests and yields which might provide a violator with an important improvement in his strategic capabilities.

53. I should now like to comment in some detail on the memorandum submitted by the Swedish delegation on 19 July 1967 and on the report to which it refers, entitled Approaches to some test ban control problems (National Defence Research Institute, Stockholm, Report C 4286 - 20(23) 1967). One conclusion of the Swedish scientists was that the utility of the so-called complexity criterion was sufficient to indicate the possibility of a control system with no more than one on-site inspection in two years. For the "no inspection" case it was suggested that the data on identification by complexity indicated the possibility of an inspection-free control system with the required 10 per cent deterrence level and limiting mistakes concerning earthquakes to once in fifteen years.

54. The theory developed in the Swedish papers requires the use of "Two statistical quantities ... to describe the ... identification methods" (ENDC/191, page 3). In order to be applicable, any of the identification criteria, in this case the complexity, must have a statistical distribution independent of the location of the event. In other words, an event of given magnitude which occurs in one area should have the same probability of having a given complexity as would an event of the same magnitude which occurs in any other area. We have studied the complexity of the seismic signals from tens of explosions and hundreds of earthquakes. Clearly the complexity of seismic signals from explosions is dependent on the location of the explosion.

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55. In order to demonstrate the problem which this presents in trying to apply this Swedish theory of verification of the comprehensive test ban, we note that during recent years three large seismic events have occurred in the vicinity of Novaya Zemlya. The Soviet Union has provided information that one of those events, that of 27 October 1966, was an underground nuclear explosion. While we cannot confirm that the other two events -- that is, those of 18 September 1964 and 25 October 1964 -- were nuclear explosions, it may nevertheless be presumed that they were, since that is a Soviet nuclear test site and an area in which natural earthquakes are exceptionally rare. The complexity values measured for all these Novaya Zemlya events were larger than almost half the shallow earthquakes in that magnitude range which occurred in the Soviet Union. In such a situation the methodology and conclusions of the Swedish report are invalid, and the number of on-site inspections required must be determined by some other method.

56. What this means is that we already know of one area in the Soviet Union, and that happens to be a well-established Soviet testing area, in which all explosions will provide signals more complex than a significant fraction of the earthquakes with which they will be compared. Every single contained underground explosion conducted in that area would be mis-identified as an earthquake if complexity were used as a criterion in the manner proposed in the Swedish report. There would, under those conditions, be no deterrent to unlimited violations. Furthermore, it is virtually certain that Novaya Zemlya is not unique in that respect. Thus there will be other areas in addition to that known test site at which all explosions would be mis-identified by that complexity criterion. If the complexity criteria were changed in order to identify correctly those explosions as explosions, then there would be many tens of earthquakes each year mis-identified as being suspicious, not one in every fifteen years as stated by our Swedish colleagues.

57. An additional point on complexity should be mentioned. Available data show clearly that the complexity values for earthquakes and explosions decrease with decreasing magnitude and that small earthquakes have simpler signatures than do larger explosions. Therefore, a useful definition of the complexity criterion at magnitude 4 requires a capability to record such small events as improved signal-to-noise levels.

58. Moreover, there is very little information on the effectiveness of any of the identification criteria at magnitudes as low as magnitude 4, which is considered by the Swedish delegation to be the threshold for magnitudes of interest. Our current studies of various criteria indicate that they are effective at teleseismic distances at

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magnitude 4.5 and above; but, as also noted by Mr. Mulley at our meeting on 3 August (ENDC/PV.319, para. 11), their effectiveness decreases below magnitude 4.5. In the region between magnitude 4 and 4.5, studies of the identification criteria are sharply inhibited because of the low signal-to-noise levels on teleseismic recordings of events in this magnitude range. The problem is further compounded by the number of earthquakes; and the number of events requiring identification increases sharply with decreasing magnitude. The prime reason why we are devoting an extensive effort to the construction of large seismometer arrays is to provide ourselves with high signal-to-noise data at low magnitudes. It then will be possible to determine the efficacy of the various identification criteria when they are applied to events with magnitudes of 4 or less.

59. We agree with our Swedish colleagues that regional or national data could be of considerable assistance in assessing the nature of events. The question here is one of how many regional stations would be available and what their quality and reliability would be. The United States data indicating the utility of regional stations were obtained from an extensive network of high-quality facilities. If a comprehensive treaty were achieved we should, on a regular basis, be willing to make our regional data available to other parties. We should like to hear from others concerning the quantity and quality of data which they would make available, and the arrangements they are willing to make to ensure that the data are reliable as well as freely and promptly available.

60. I should like to conclude by reiterating that the United States is applying large scientific and economic resources to the solution of the verification problem. We have repeated the results of our research to this Conference on many occasions and also published them in scientific reports. If it appears that progress is slow, it should be clear that this is not because of lack of effort. Slow progress results from the difficulty of the problem combined with the vital need that verification requirements and capabilities be assessed accurately. We are continuing to expand our research and data collection and analysis activities.

61. As you know, for the past three years we have been conducting a series of experiments to improve our capabilities for accurately locating seismic events in the Aleutian-Kurile island chains. The analysis of the results of last year's Kurile experiments will be available in technical reports shortly. The improvements in our ability to locate

(Mr. Foster, United States)

seismic events in those areas as a result of those continuing experiments will help in eliminating from the potentially suspicious category those seismic events which can be shown to have occurred under the water rather than under land areas.

Furthermore, as a result of the success of the large seismic array which has been operating for two years in Montana, and which some of the representatives here have seen, we are now proposing as a co-operative enterprise to install in Norway a second large array which will advance still further the state of the art.

62. Thus I believe that the United States has shown that it takes seriously its responsibilities for attempting to solve the verification problems attendant to the achievements of a comprehensive test ban. Reports such as those recently submitted by the Swedish delegation, and the ensuing technical discussions, contribute substantially to our mutual understanding of the problem. Other work carried out and reported on by our United Kingdom colleagues has also been of crucial importance. If all parties conducting work in this area from whom we have not yet heard discussion of the technical issues were to make available their conclusions, we might reach more rapidly our goal of an adequately-verified comprehensive test-ban treaty.

The Conference decided to issue the following communiqué:

"The Conference of the Eighteen-Nation Committee on Disarmament today held its 320th plenary meeting in the Palais des Nations, Geneva, under the chairmanship of H.E. Ambassador A.A. Roshchin, representative of the USSR.

"Statements were made by the representatives of Romania and the United States.

"The next meeting of the Conference will be held on Thursday, 10 August 1967, at 10.30 a.m."

The meeting rose at 11.45 a.m.