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# **HISTORY OF THE PUGWASH CONFERENCES**

By Professor J. ROTBLAT

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To U Thant  
with best wishes  
Rotblat

# HISTORY OF THE PUGWASH CONFERENCES

By

PROFESSOR J. ROTBLAT

Secretary-General, Pugwash Continuing Committee

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# PUGWASH CONTINUING COMMITTEE

*Chairman : The Earl Russell*

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*Members :*

Prof. Harrison Brown; Academician E. K. Federov;  
Prof. Bentley Glass; Prof. N. F. Mott; Prof. C. F.  
Powell; Prof. Eugene Rabinowitch; Academician  
D. V. Skobel'tzyn; Academician A. V. Topchiev

8, ASMARA ROAD,  
LONDON, N.W.2

HAMPstead 1471

June, 1962.

Mr. U Thant,  
Secretary-General,  
United Nations,  
United Nations Plaza,  
New York, N.Y., U.S.A.

Sir,

I have the honour to present to you, on behalf of the Pugwash Continuing Committee, copies of the Proceedings of the Seventh and Eighth International Conferences on Science and World Affairs, held at Stowe, Vermont, in September 1961.

As at previous Conferences, we have been concerned with the grave problems which have arisen from the stupendous advances of science and technology. In the Seventh Conference we discussed international scientific cooperation as a means of creating greater trust between nations, in addition to the direct benefits which such cooperation is bound to bring. In the Eighth Conference we continued, and took a step further, our efforts to find a generally acceptable solution to the problems of disarmament and world security.

My Committee hopes that these contributions of scientists to the thinking on the most complex problems of the day will be of some help in your own efforts to establish a peaceful and prosperous world.

I am, Sir,

Yours truly,



Secretary-General



Proceedings  
of the  
EIGHTH INTERNATIONAL CONFERENCE ON SCIENCE  
AND WORLD AFFAIRS

Disarmament and World Security

Stowe, Vermont, U.S.A. - September 11-16, 1961

# INTERNATIONAL PUGWASH CONTINUING COMMITTEE

Chairman: The Earl Russell

Secretary-General: Professor J. Rotblat

## Members:

Professor Harrison Brown; Academician E. K. Fedorov;  
Professor Bentley Glass; Professor N. F. Mott;  
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---

U. S. Planning Committee for the Eighth Conference

on

Science and World Affairs

Harrison Brown, Chairman  
Paul Doty  
Bentley Glass  
Richard Leghorn  
Eugene Rabinowitch

Hosts:  
National Academy of Science  
American Academy of Arts  
and Sciences



Forty-eight participants from eleven countries met at Stowe, Vermont, U.S.A., September 11-16, 1961, for the Eighth International Conference on Science and World Affairs. The first meeting was held at Pugwash, Nova Scotia, in 1957. The present conference is the fourth devoted exclusively to consideration of Disarmament and World Security.

The papers in this volume were prepared by the participants for presentation at the plenary session and for consideration by the five working groups. Minutes of the plenary sessions are not included, in keeping with the tradition of encouraging full and informal discussion by the participants as private individuals rather than as official representatives of national governments.

These collected papers are circulated to participants and to appropriate government agencies of different countries. Request for publication must be directed to each individual author.

The Planning Committee for the COSWA Conferences wishes to express its gratitude to the Ford Foundation for a generous grant which made possible the two conferences held in September, 1961, in Stowe, Vermont, and to the Christopher Reynolds Foundation which made the publication of the present volume possible.

Chicago, Illinois, U.S.A.

March, 1962

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Cornell University  
Ithaca, New York, U.S.A.

Hans Thirring  
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PROGRAM FOR THE EIGHTH CONFERENCE ON SCIENCE  
AND WORLD AFFAIRS

September 11-16, 1961

Stowe, Vermont, U.S.A.

---

DISARMAMENT AND WORLD SECURITY

Monday, September 11

Plenary Session I: 9:30-12:30      Conference Hall

Chairman: J. Rotblat

1. V. M. Khvostov: "Review of Events in the Field of Disarmament Since the Sixth Pugwash Conference in Moscow"
2. Paul Doty: "Disarmament - 1961"
3. A. V. Topchiev: "On General and Complete Disarmament"
4. Harrison Brown: "An Approach to Disarmament" (paper prepared by Brown and Katz)

Plenary Session II: 2:30-5:30      Conference Hall

Chairman: Francis Perrin

General discussion on papers read in Session I.

Tuesday, September 12

Meetings of Working Groups: 9:30-12:30 and 2:30-5:30

- Group 1 - Nuclear Production and Stockpiles
- Group 2 - Delivery Systems
- Group 3 - Selected Next Steps in Arms Reduction
- Group 4 - Problems of General and Complete Disarmament
- Group 5 - Preconditions to Possible Success at Negotiations and Initiation of Disarmament Measures



Wednesday, September 13

Plenary Session III: 9:30-12:30 Conference Hall

Chairman: A. V. Topchiev

Reports from Working Groups 1, 2, 3.

Plenary Session IV: 2:30-5:30 Conference Hall

Chairman: Paul Doty

Reports from Working Groups 4, 5.

Thursday, September 14

Meetings of Working Groups 9:30-12:30 and 2:30-5:30

Friday, September 15

Plenary Session V: 9:30-12:30 Conference Hall

Chairman: Sir John Cockcroft

Revised reports from Working Groups 1, 2, 3.

Plenary Session VI: 2:30-5:30 Conference Hall

Chairman: F. B. Straub

Revised reports from Working Groups 4, 5.

Saturday, September 16

Plenary Session VII: 9:30-12:30 Conference Hall

Chairman: Harrison Brown

General discussion

Summary of findings

Conference Statement

I had looked forward to sending my best wishes to the Conference on Science and World Affairs under happier and more optimistic conditions than now prevail. The somber turn of events within the past week, a course against which your past conferences have strongly counselled, makes all the more urgent the matters you meet to discuss. As you take up the problems of scientific cooperation and disarmament, I urge that you search with renewed diligence and imagination for practical ways in which to set forth on both these paths to peace.

Science remains universal and the fruits of science, if wisely chosen, provide a means by which humanity can realize full and abundant life. If the vitality of science, its ability to enrich our culture and our understanding, and the material benefits it promises all, depend in large measure upon international pooling of knowledge and effort, then national leaders who share this view must look to scientists such as yourselves for the initiative and guidance to transform the desire to cooperate into actual achievement. We hope that out of the suggestions and proposals that you make, new ways can be found to extend the benefits of science and to foster the trust and mutual understanding that is essential to a prospering world.

In other areas of your discussion, you will have opportunities to advance the world-wide search for a solution to the central threat of our time--nuclear war. Your past conferences have revealed that special knowledge and concern makes you particularly sensitive to the meaning of this threat. The task of disarmament is not easy, and progress, the world has found, is not inevitable. But when men of good will meet in such frankness as your discussions typify, the door of peace is open, reason can guide us forward, and all nations can begin to face their full responsibility to mankind.

I am hopeful that your deliberations in their quiet and beautiful Vermont setting will be informed by the objectivity of your science and inspired by the desire of men everywhere for peace. Despite setbacks, there is no more nobler or urgent cause than the development of practical ways to bring closer the goal of reliable disarmament.

September 4, 1961

John F. Kennedy  
The Summer White House  
Hyannis, Massachusetts



There has been established a good tradition that outstanding scientists of different countries of the world, united by the Pugwash movement, periodically meet at their conferences to find ways to free humanity from the threat of world destructive war. In a relatively short period of time the Pugwash movement of scientists has made an important contribution to the struggle of people for the realization of this urgent contemporary problem.

The Soviet Union, the people of which are vitally interested in the establishment of lasting peace on the earth, has submitted in the past to the United Nations proposals concerning general and complete disarmament, the practical realization of which would free the peoples forever from the threat of thermonuclear war which hovers over them. The Soviet program of general and complete disarmament which provides for the liquidation of all kinds of armaments and armed forces under strict international control has found wide support in world-wide public opinion.

The people have had great hopes for the success of the negotiations on disarmament. But there are still forces in the world which are not interested in disarmament and the liquidation of the cold war. Moreover, these forces have recently utilized truly peaceful proposals of the Soviet Union concerning the conclusion of a peace treaty with Germany and normalization on this basis of the situation in West Berlin to proclaim openly the course toward war against the Soviet Union and other Socialist countries. There has been accumulating in the center of Europe combustible material which can convert into a new world war at any time if the peace loving forces do not take decisive measures. German revanchists and militarists have openly taken the path of military preparations, creating a mass army equipped with the most modern arms, in order to plunge mankind into the abyss of a destructive world war.

In this situation, the Soviet Union has recently taken a number of measures to strengthen the security of our country, to block the way for German revanchists and their patrons. Among those measures, the decision of the Soviet government to resume nuclear testing occupies an important place. The Soviet government took this step with a heavy heart and deep regret, but it is convinced that this serious measure will serve the cause of preventing a new world war.

The peaceful policy of the Soviet Union remains unchanged, and we shall continue to do our best to prevent the occurrence of a destructive nuclear war, to achieve general and complete disarmament, and to insure permanent peace and tranquility on the earth.

The present serious situation urgently requires still more from all the people who sincerely wish to preserve peace, to intensify the struggle against the threat of a new world war, and to work for general

and complete disarmament. Men of science who know very well the terrible consequences for mankind of a nuclear war if it were unleashed have a very important role to play in this struggle.

Greeting wholeheartedly in the name of the Soviet Government and of myself the participants of the Pugwash Conference, outstanding scientists of different countries of the world, I sincerely wish you success in your fruitful work for the sake of peace and friendship between nations.

September 5, 1961

Nikita Khrushchev  
The Kremlin  
Moscow



Hearty greetings to conference participants and best wishes for success in your work. The problems of international scientific cooperation for the benefit of peace and friendship between nations, which are being discussed by the Pugwash conference, are near and dear to scientists of every country. With such cooperation, scientists can make the greatest contribution toward peace and progress of mankind.

The Pugwash conference meets when the international situation is very tense. We feel confident that fruitful discussions will help to relax international tensions and establish mutual understandings between countries. We hope that the conference will help to solve vital problems now facing mankind and reach an agreement on general and complete disarmament, and the cardinal settlement of the German problem, through conclusion of a German peace treaty. Soviet scientists will, on their part, make every effort to establish relations of genuine international cooperation toward peace and remove international tension.

Heartfelt good wishes to the Pugwash Conference!

Successful work on behalf of World Peace.

FROM: Soviet Peace Committee  
Scientific Relations Commissions  
Moscow, USSR

DATE: September 11, 1961

Cable received September 10, 1961 at 2:50 p. m.

STATEMENT FROM THE EIGHTH CONFERENCE ON SCIENCE  
AND WORLD AFFAIRS

--Stowe, Vermont, September 11-16, 1961--

---

The Eighth Conference on Science and World Affairs was held at Stowe, Vermont, from September 11 to September 16, 1961; its general subject was Disarmament and World Security.

It is gratifying that in such troubled times it proved possible for forty-eight scientists from 11 countries to meet in a friendly atmosphere and to examine together carefully the dangers which face the people of the world.

During the previous week the Seventh Conference, devoted to International Cooperation in Science, had outlined many important areas where cooperative action would be scientifically productive as well as effective in improving international understanding. In this Eighth Conference, a wide range of topics was discussed in plenary session, in separate working groups, and in private conversation.

The subjects of study which related in one way or another to the problems of attaining stable peace, world security, and general and complete disarmament included:

- Cessation of production of fissile materials for military use and destruction of military nuclear stockpiles;
- Elimination and control of means for weapons delivery;
- Demilitarization of outer space;
- Interdependence of international political settlements and disarmament;
- Nuclear weapons tests;
- Military disengagement, and creation of demilitarized and atom-free zones;
- International security forces;
- Methods of settlement of international disputes;



- Rules of peaceful coexistence;
- Organization of control and inspection over disarmament;
- Conditions for creating trust and confidence among nations;

A variety of individual views was expressed. These were often quite divergent, but were explored in a frank manner. The participants found the discussions helpful in clarifying points of view, and common understanding was reached on a number of important issues. We hope this will open important avenues for constructive action.

The participants of the Conference are united in the realization of the danger of unleashing a nuclear war, which would cause untold destruction and bring death to innumerable people. We hope that the desire for peace and the revulsion against war, which are shared by all peoples, will make possible a peaceful resolution of the conflicts which have led to the present deterioration of the international situation, and make possible the attainment of complete and universal disarmament, and the establishment of stable peace on earth.

In the present crisis we reaffirm our belief in the general principles enunciated in the Vienna Declaration of September, 1958.

This meeting kept open a much needed informal channel of communication among scientists concerned with the future of civilization.

For this reason it is hoped that similar conferences will be convened by the Continuing Committee at suitable intervals in the future. In addition, plans have been made to form continuing unofficial East-West study groups in order to devote more detailed attention to problems of the nature of those considered at the present Conference.

Sir Mark Oliphant - Australia  
Professor G. Nadjakov - Bulgaria  
Professor J. Polanyi - Canada  
Professor G. Burkhardt - Federal Republic  
of Germany  
Dr. Francis Perrin - France  
Mr. Pierre Rosenstiehl - France  
Professor P. M. S. Blackett - Great Britain  
Sir Edward Bullard - Great Britain  
Sir John Cockcroft - Great Britain  
Mr. Michael Howard - Great Britain

Rt. Honorable Philip Noel-Baker - Great Britain  
 Sir William Penney - Great Britain  
 Professor J. Rotblat - Great Britain  
 Professor F. B. Straub - Hungary  
 Professor Toshiyuki Toyoda - Japan  
 Professor B. V. A. Röling - Netherlands  
 Mr. N. I. Bazanov - Soviet Union  
 Academician A. A. Blagonravov - Soviet Union  
 Academician N. N. Bogolubov - Soviet Union  
 Academician M. M. Dubinin - Soviet Union  
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 Mr. S. G. T. Korneev - Soviet Union  
 Mr. V. P. Pavlichenko - Soviet Union  
 Academician N. M. Sissakian - Soviet Union  
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 Academician I. E. Tamm - Soviet Union  
 Academician A. V. Topchiev - Soviet Union  
 Professor Hans Bethe - United States  
 Professor Harrison Brown - United States  
 Professor Paul Doty - United States  
 Professor B. T. Feld - United States  
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 Professor Eugene Rabinowitch - United States  
 Professor Matthew Sands - United States  
 Professor Louis B. Sohn - United States  
 Professor Leo Szilard - United States  
 Professor Charles Townes - United States

The National Academy of Sciences and the American Academy of Arts and Sciences were hosts to this as well as the preceding Conference. Both Conferences were organized by the United States organizational Committee under the aegis of the International Continuing Committee of these Conferences.

The following did not join in the resolution:

Professor R. R. Bowie  
 Dr. Donald Brennan  
 Mr. Amron Katz  
 Professor Henry Kissinger  
 Professor Leon Lipson

The following were absent during the discussion of the statement:

Mr. Trevor Gardner  
 Professor Charles Lauritsen  
 Professor I. Rabi



I. REPORTS FROM WORKING GROUPS

## REPORT FROM WORKING GROUP I --NUCLEAR PRODUCTION AND STOCKPILES--

---

Working Group I had a successful meeting in a very cooperative spirit. Nearly complete agreement was reached.

The group agreed to discuss the reduction or elimination of nuclear production and stockpiles within the framework of a general and complete disarmament agreement. It should form part of such an agreement and should fit into definite stages of the approach to complete disarmament. It is understood in this paper that "stockpiles" refers to nuclear weapons as well as nuclear materials. In particular the reduction of existing stockpiles would be most effective if it goes hand in hand with the reduction of the means of delivery of weapons.

The problem of the destruction of stockpiles of nuclear weapons is very special in the respect that fissionable materials used in these weapons are also to a large extent used for peaceful purposes and, moreover, are produced in the process of normal operation of atomic power plants. Therefore, much attention was paid to the problem how to achieve reliable disarmament in this particular field and at the same time to retain peaceful atomic industry. The problems relating to cut-off of production and to the elimination of stockpiles were considered separately.

### A. Cut-off of Production

The elimination of further production of fissile material for weapons is a far easier problem, and should take effect earlier than the reduction of stockpiles. There was agreement that it would be best to discontinue completely the production of highly enriched U-235. This would not seriously affect the ability of the United States or the Soviet Union to make nuclear weapons, because of the large existing stockpiles of this material. (The U. S. stockpile has been estimated unofficially<sup>1</sup> as 300-350 metric tons.) In fact, the nuclear powers could take fissile material out of obsolete weapons and fabricate it into more modern ones. However, a production cut-off would clearly by itself slow down the arms race. In the framework

---

<sup>1</sup>Kalkstein, M. and Smith, W., "An Estimate of the Nuclear Stockpiles from Unclassified Sources," Arms Reduction Program and Issues, edited by David H. Frisch, Twentieth Century Fund, 1961, pp. 91-97.



of general and complete disarmament, it would be followed by the elimination of stockpiles.

The demand for fissile material for nuclear power and other peaceful purposes in the next decade or two will be only a small fraction of existing stockpiles. Moreover, there was consensus that material of low enrichment is quite adequate for most nuclear reactors, three to five per cent being sufficient in very many cases and 20 per cent in nearly all. Twenty per cent material is of little direct military value. It was realized that enrichment from 20 per cent to over 90 per cent, i. e., to military grade, is possible with much smaller isotope separation plants than enrichment from natural uranium (0.7%) to 90 per cent. However, the group agreed that 20 per cent material is considerably safer against diversion to military uses than 90 per cent. It might, therefore, be considerably safer to produce only 20 per cent enriched material. However, the group recommends that the cut-off of production of U-235 should be effective immediately and should be complete. Only when it becomes necessary for peaceful uses, additional material should be produced for this purpose.

Plutonium presents a more difficult problem since it is produced in the normal operation of most reactors. A cut-off of plutonium production would mean an end of the nuclear power industry, and the group therefore recommends against such a measure. Instead, the group recommends strict control over plutonium production. The critical link in this production is the chemical extraction of plutonium from irradiated reactor fuel elements, and the group agreed that in view of the special danger of diversion of this material to military purposes, the management of the plants for the extraction of plutonium should be responsible to an international authority. (This particular issue was not in its present form discussed with Dr. Bethe, since he left in the morning, but was agreed to by Professor W. Penney and Dr. Tamm.) The (rather few and large) existing plants for plutonium extraction should be used. They might either be operated by the national personnel of the corresponding country, but under an especially strict international control, or be operated with about 90 per cent of the personnel consisting of the present national operators, but 10 per cent of the staff, especially the managerial and analytical staff, being international. Nuclear power stations would continue to be nationally managed and operated, but at least in the larger stations a few per cent of the personnel would be international inspectors guarding against diversions of material both before and after irradiation. Transportation of irradiated fuel elements should be done under strict international control.

The question of denaturing of plutonium by admixture of Pu-240 was discussed. It was pointed out that this is not an effective



measure against military use by a sophisticated nuclear power but might be of some effect in the case of new nuclear powers. Such admixture is, therefore, recommended for plutonium delivered under control for civilian use.

As already pointed out, a production cut-off without reduction and ultimate elimination of stockpiles will not decrease the nuclear weapons potential of the present nuclear powers. It would make it impossible for additional powers to build nuclear weapons by their own efforts. A very important benefit would be that experience would be gained with a control system which would be largely applicable in the later stage of stockpile reduction.

Cheating on the agreement would be of very little benefit to the nuclear powers. Diversion of material from power reactors would be very difficult especially with the international inspection described above. It is unlikely that diffusion plants or major reactors could be concealed. Light aerial inspection will be necessary at some stage to discover possible clandestine plants, but their large size and power requirements (or production) should make this rather easy. Centrifuge plants for separating uranium are reported to be smaller and therefore might be harder to detect. However, their production would be correspondingly small, and would be of no appreciable value to the nuclear powers in comparison with their present stockpiles. This might change when the stockpiles are appreciably reduced, but at this time also the controls will be tightened.

A possibly more effective way to "cheat" for the nuclear powers might be to transfer some of their stockpiles to some ally before stockpile reduction takes effect, but there are obvious elements of danger in such a procedure.

Small production units--centrifuge separators, or productive reactors plus chemical extraction of plutonium--might be of greater usefulness to some of the powers which at present do not have nuclear materials or weapons. Such action might cause considerable local disturbance, but would not constitute a danger to world peace during the transitional period when the present nuclear powers retain an appreciable fraction of their present stockpile and are agreed to act against a smaller power, breaking the cut-off convention. In the ultimate stage of complete disarmament it is assumed that inspection will be efficient enough to ensure against even small clandestine production units.

The group believes that it would not be practicable to control the production of fusionable materials. Heavy water is produced in large amounts for reactors and other civilian uses, amounts



much larger than those in fusion weapons. Lithium-6 is not of much use outside of weapons, although Lithium-7 might be (as a coolant for high-temperature reactors). Lithium separation requires special plants, but these are much smaller and simpler than those for uranium separation, and hence much harder to control. The only exception among fusible materials is tritium for whose production reactors are required; its production can be cut off as easily as that of uranium 235, and this would have the consequence of an automatic reduction of the stockpile because of the small half-life (12 years) of tritium.

The group agreed that the cut-off of production for military purposes, when agreed on, should be considered to be permanent, with a view toward ultimate complete disarmament, rather than limited to five or ten years.

## B. Stockpile Reduction

1. Much attention was paid to the question how accurately can past production of U-235 and Pu-239 be estimated in order to determine the possible size of existing stockpiles of these fissionable materials. In the opinion of the group a conservative and even perhaps a pessimistic estimate of the precision of such a determination of the size of past production would be of the order of 20 per cent, under the assumption that there would be (a) free inspection of relevant plants, (b) free access to the records of production and delivery, and (c) interrogation of the personnel of the plants. Such a degree of precision can be achieved even if there were attempts to forge the records.

It was suggested that, in order to minimize the possibility of such a forgery, all records of production and delivery of fissionable materials for the past should at the earliest possible date be deposited in each of the countries concerned in a depository guarded by an international guard, with the understanding that (a) the records remain secret up to the time when the reduction of stockpiles would begin, and (b) that up to this time no records deposited could be withdrawn.

2. The reduction in the stockpiles will be a very important step in the process of general disarmament. In the opinion of the group the stockpiles could, in a first stage, be reduced to about 20 per cent of their present size, either in a single step or in two. In the latter case, the first step might reduce their size to about 50 per cent, and they might be held at this level for about a year or two, while the control system is being put into effect and its efficacy is being tested. The particular figure of 20 per cent for the remaining stockpiles was chosen to be equal to the above estimate of the maximum

amount which might possibly be concealed by some country from the international inspection system. Even if such concealment were to be attempted, this would at most give a twofold advantage in stockpile to the violator, and the group felt that such an advantage would not be sufficient for a country to initiate a nuclear war. In the opinion of the group a reduction of stockpiles by a percentage less than about 50 per cent would be rather meaningless whereas a reduction of the order of 50 per cent will be of very great importance, and a reduction of about 80 per cent would constitute a tremendous change, especially if coupled with the reduction of delivery systems.

The group discussed whether in this stage of disarmament the stockpiles of each country should be reduced to the same percentage of their present size (which gives an advantage to the country possessing the larger initial stockpile) or whether the stockpiles of the United States and the Soviet Union should be reduced to the same absolute size. It was agreed that, when the level of about 20 per cent is reached, the absolute amount of fissile material should be equal on both sides (being either 20 per cent of the mean size of the stockpiles of the USSR and the U.S., or 20 per cent of the smaller of these stockpiles) on the basis of the argument that a corresponding absolute equality is also attempted in existing plans on the reduction of conventional forces. In a first step of reduction to 50 per cent (if such a step is taken), both possibilities (reduction to the same percentage or to the same absolute amount) should be further considered.

At later stages of disarmament when controls have been found to work satisfactorily, further substantial reductions in military stockpiles should be made and, ultimately, complete elimination should be achieved.

3. It was the opinion of the group that there is no valid justification for the destruction of the eliminated fissionable materials and that these materials should be transferred to peaceful uses (e.g., breeding reactors, fast atomic reactors, etc.) under a strict international control. Besides, the existing stockpiles of U-235 should be mingled with U-238 so as to be converted into uranium containing up to 20 per cent of U-235. Uranium with such a content of U-235 will be appropriate for utilization in reactors, but could be used for military purposes only after being subjected to a complicated process of enrichment.

Only a small part of the existing amount of U-235 (of the order of one or several per cent) should be conserved intact for some special peaceful purposes. Any stockpile of such a kind in any country derived from the breakdown of weapon stockpiles should be available to other countries for peaceful uses and should be under



strict international control.

4. As to the fusionable materials (lithium, deuterium), it would be of use to ascertain the past production only of the Li-6, and not for deuterium, by the methods outlined above for fissionable materials (inspection of plants, records, etc.). But for the reasons discussed above, the estimates of production of Li-6 are likely to be less reliable than those for fissile materials. However, although different projects for the realization of fission-free atomic weapons are under consideration and research in this direction is being conducted, it was felt that at present fissionable materials, the production of which can be ascertained more accurately, are indispensable for nuclear weapons.

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REPORT FROM WORKING GROUPS I and II  
--DELIVERY SYSTEMS--

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Considering the problem in the context of general and complete disarmament, Groups I and II reached agreement on a possible sequence of events leading to the destruction of delivery systems:

1. When a treaty on general and complete disarmament is signed, amongst the first steps will be the extensive destruction of delivery systems and associated facilities as described below in paragraphs 2, 3, 4, and 5.

2. Upon signing the treaty, the parties will supply to each other a list of all delivery systems and associated facilities in their possession (including, for example, the numbers and types of: rockets, military surface ships, submarines, bombers; bases from which rockets, ships, or bombers may be dispatched; supply depots, etc., associated with these delivery systems; installations which play a part in the support of any of these delivery systems; and installations which contribute to the production, research, and development of the various delivery systems). This list will not include the detailed locations of any of the sites, bases, installations, facilities, etc., included in the list.

3. Shortly after exchange of the lists mentioned in paragraph 2, a certain percentage of the declared delivery vehicles as fixed in the treaty will be destroyed and this destruction will be verified by the international control organization. Lists of the vehicles to be destroyed, with exact locations, will be submitted before actual destruction.

4. Thereafter, to verify the completeness of the lists, the international authority will inspect agreed upon portions of the territories of the signatories of the treaty, using such methods as necessary to verify in that area the declarations made as to the total number of delivery systems and associated facilities.

5. The inventories of delivery systems and installations will be destroyed in agreed increments, which will be verified as destroyed and will be matched by extending the geographic area subject to veto-free inspection as described in 4. The greater the percentage destroyed, the broader is to be this inspection and control. The treaty must specify both the fractions of the means of delivery to be destroyed at each of the above stages and the fractions of the total areas of the national territories to be subjected to the expanding inspection, as well as the nature of inspection and appropriate procedures.



6. We agree that a certain number of rockets and launching pads will be left to be used for peaceful purposes, for example, for research on space, creation of international meteorological service, international communications, etc. These items will be used under permanent international control.

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REPORT FROM WORKING GROUP III  
--SELECTED NEXT STEPS IN ARMS REDUCTION--

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The morning discussion on September 14 was devoted to the study of the first step of a disarmament plan as part of a comprehensive plan for general and complete disarmament. The group had before them the detailed proposals of the USA and the USSR to the Committee of Ten in June, 1960, and noted their marked differences in approach. A long discussion took place on possible ways in which a substantial degree of disarmament and increased security could be achieved while maintaining a strategic balance between the two blocs. The essential problem has long been recognized as that of finding a suitable phasing of the various steps in disarmament, inspection, and control. Following the argument at the Moscow Conference, it was held that the degree and completeness of the inspection system should increase as the disarmament proceeds.

Clearly there are many possible solutions, and several were discussed. However, out of the discussion emerged one which seemed worthy of further detailed consideration. So a small committee of the group prepared a draft statement for submission to the afternoon meeting which was held in conjunction with Group IV.

General Principles:

1. We have considered the first steps in a disarmament agreement in the framework of general and complete disarmament.
2. The first stage in such an agreement must involve arms reduction measures large enough to lead to a radical diminution of the chances of a nuclear war.
3. At all times during the stages of such an agreement, all parties must be convinced that the strategic balance is not upset.
4. The reduction of armaments must at all times be accompanied by sufficient effective controls to assure both sides against violation of the agreement.
5. The achievement of an agreement on general and complete disarmament and the attainment of a substantial first-stage of disarmament would contribute very substantially to the solution of outstanding political problems.



6. We urge that further detailed studies of a first-stage, the outline of which is given below, are urgently needed and we strongly endorse the recommendation of Working Group IV for an international study group.

#### Specific Proposals:

In accordance with these principles the agreement on general and complete disarmament should include in the first step--

1. Limitations on conventional forces according to a formula similar to those suggested by both sides, in previous proposals. No transfer of nuclear weapons or technical information from the present nuclear powers to any other power.
2. A complete published inventory of military manpower, weapons, delivery systems, means of production of weapons and weapons materials, to be submitted by both sides to an international control commission at the beginning of the agreement.
3. Rapid reduction of stockpiles of delivery systems and weapons materials by a substantial percentage of the declared inventory and the diversion to peaceful uses of a substantial percentage of fissile materials to be verified by the international control commission.
4. The prohibition of nuclear weapons tests and of further production of weapons material and delivery systems with the institution of the required stage controls as outlined in the reports of other working groups, such as inspection at declared production plants.
5. Upon the completion of the above measures, the institution of a system of inspection using suitable forms of sampling designed to verify the temporarily remaining declared armaments, including delivery systems and stockpiles, and to monitor the test ban. From this point on, the completeness of inspection would bear a direct relation to the degree of reduction achieved. Simultaneous with the institution of this inspection, a continued reduction of delivery systems and stockpiles to agreed levels consistent with strategic requirements of both sides for a minimum deterrent force.

This phase of the disarmament process should imply a further commitment to proceed to complete inspection simultaneous with final reduction of delivery systems and nuclear stockpiles to the lowest verifiable levels.

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REPORT FROM WORKING GROUP IV  
--GENERAL AND COMPLETE DISARMAMENT--

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We here reached an agreement on the following points:

In discussing the problems of a disarmed world, we agreed that none of them will be as dangerous as the problems with which we are faced today. In some areas, new problems might arise with the disappearance of military power and of the fear of major war. These problems should be studied further.

In particular, in a disarmed world, importance of strategic problems connected with national frontiers will substantially diminish. Although some of the existing frontiers are in dispute, any changes should be made only by negotiation or other peaceful means. For instance, the existing German frontiers could not be changed without a great upheaval.

The stability of a disarmed world will depend to a large extent on general acceptance of methods of solving international disputes by means other than the use of military force. The Charter of the United Nations provides various means for the peaceful solution of international disputes. In a disarmed world, the United Nations will have a much better chance than it has today to make effective the basic principles of the Charter. The influence of world public opinion will also increase, and no nation will be able to ignore recommendations having behind them overwhelming support of the United Nations and of the public opinion of the world.

In a disarmed world, even more than at present, it will be necessary to protect each group of states against the arbitrary actions by majorities in international organs.

Both during the period of actual reduction of armaments and after complete disarmament has been achieved, the process of inspection should not be subject to veto in any form. In case of a gross and properly ascertained violation of the disarmament treaty, if agreement cannot be reached on means of enforcement, each nation would have the option of taking such steps as it would deem necessary in order to protect itself against such a violation.

In addition, we considered the following questions:

(a) Ideological conflicts caused by social and colonial revolutions, especially those in which assistance from abroad is influencing the outcome.



(b) Usefulness of regional arrangements in solving local disputes and in policing a region.

(c) Settlement of economic conflicts.

(d) Economic consequences of disarmament, which can probably be solved by proper advanced planning.

(e) Control of new technological developments which may introduce new dangers in a disarmed world.

(f) Development of international criminal law applicable directly to individuals violating the disarmament agreement or committing other crimes against peace.

(g) Protection of rights of various states against arbitrary majority action and adaptation of the United Nations Charter to contemporary conditions.

(h) Limitation of propaganda directed against other nations or races.

(i) Controls over the manufacture and trade in conventional and police armaments.

We suggest that these problems be studied by the joint research group to be established.

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REPORT FROM WORKING GROUP V  
--PRECONDITIONS TO POSSIBLE SUCCESS OF  
NEGOTIATIONS AND INITIATION OF  
DISARMAMENT MEASURES--

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It will be clear that there is considerable overlap with Group IV. Probably it would have been better for us to have eliminated Group V and distributed the members among more useful groups.

It is unfortunate that so constructive a brief turned out to be incredibly difficult. At the last plenary session our rapporteur presented an admirable account of our proceedings, but had to indicate that we had reached no agreed conclusions. On this occasion he is not prepared once again to take over the duties of the chairman, so that I must do the best I can to emulate his performance, with the exception that I am able to include, in what I say, three decisions, or resolutions, reached after 2.5 days of work!

Our discussions were by no means confined to our brief, and because some members of the group who submitted proposals had to spend much time away from the meeting, it was necessary not only to abandon the order of subjects in the agenda, but to consider some questions in a series of disjointed moments.

For the sake of this report, I shall follow the order of matters in our agenda and will gather together our spread-out discussions.

1. International Behavior

The Conference will recollect that a large part of the first day of our work was devoted to this subject. This is equally true of our second day of discussions, though the fruit of our efforts appears insignificant.

There was one very important difference between East and West over this question of international behavior. In the one case it was emphasized that conflict was part of nature and inevitable so long as the West remained organized politically as it was: Conflict was the natural result of historical forces and influences and did not arise, in general, from particular acts or decisions alone. On the other hand, most members of the Western nations believed that it was the acts of governments which created conflicts and that it should be possible to ensure that governments acted rationally and avoided conflicts which are unnecessary. This difference proved insoluble. Proposals made by Western members, aimed at such measures as



agreement that political conflicts be put in cold storage for a cooling off period, during which no hasty actions were taken by either side, were rejected by our Eastern colleagues. A suggestion that some rearrangement within the United Nations be made which would enable it to act as an arbitrator, mediator, or conciliator in disputes, was opposed on the ground that negotiation and settlement of all disputes was a major duty of the United Nations, as it exists, and that it would be an impertinence and an interference with the internal affairs of the U.N. were we to recommend any alterations whatever in its structure. There was even greater opposition by the East to any idea that a process of arbitration or mediation was feasible outside the U.N.

On the other hand, our Eastern colleagues repeatedly urged that all differences between nations be resolved by negotiation, and not by resort to war.

The major premise of the West was that the new weapons make obsolete the old responses, i. e., expression of national purpose through threat and build-up of arms, is both ineffective and dangerous. Hence, we need completely new attitudes, procedures and mechanisms.

## 2. Conditions for Creating Trust and Confidence

There was much discussion of the part played by existing restrictions upon exchanges of persons and of information between the East and the West, and other difficulties arising from the general problems of secrecy. I use the term "exchange" because our socialist colleagues were unable to accept such expressions as "free flow of persons and information." However, these discussions (as all our discussions) were illuminating and helpful to both sides. The following statement was agreed unanimously:

### Statement No. 1:

International confidence, necessary for progress in the field of disarmament which in turn will facilitate the development of international confidence, would be strengthened by the reduction of unnecessary secrecy. We recommend to governments that they encourage the expansion of scientific, cultural, touristic, and other contacts, as well as of the exchange of information, and that they take steps to remove obstacles in the way of such an expansion.

It was felt by the Western members of the group that disarmament negotiations were carried out at present without the essential careful preparation and clarification of all aspects of the problem before negotiations began. As a result of discussion, the following

statement has been agreed unanimously:

Statement No. 2:

The problems of disarmament are sufficiently complex as to demand in most cases careful examination of them on a national basis and informal discussions on an international basis, as an adequate preparation for the negotiation of agreements. Failure to take these steps may result in the premature taking of firm positions, and in frustrations. We urge that nations provide for extensive and continuing study of the problem of disarmament. The joint study group proposed elsewhere in this conference under the aegis of the Academy of Sciences of the USSR and the American Academy of Arts and Sciences should also be very useful. We urge further that preparations for negotiations should also include the use of informal discussions, these discussions and any conclusions reached in them being protected from use for any purposes harmful to the attainment of agreement.

The group discussed in detail the major obstacle to successful negotiation of complete and general disarmament arising from the absence from the negotiations of at least one very important sovereign nation. It is unnecessary to elaborate this extremely important difficulty. After prolonged discussion the following statement was agreed unanimously:

Statement No. 3:

The Conference considers that the United Nations must play an important role in the solution of the problem of general and complete disarmament with effective control, including all those steps leading toward the achievement of this goal which require the participation of all nations.

Therefore, the Conference urges the United Nations to make the necessary efforts to insure representation in the U.N. of all the peoples of the world, and to insure that the U.N. serve as a forum for discussion between nations, as well as an organization for the peaceful settlement of international problems.

On the question of trust between nations, it was the opinion of the Western members of the group that certain steps could be taken to build that degree of trust which would enable firm steps in disarmament to be taken. Alternatively, one of our members put the proposition that it was essential that a degree of trust be taken for granted, even though it were unjustified.



On the other hand, the attitude of the East was that trust can be developed only through disarmament, so that the two--disarmament and trust--must go hand in hand.

We were unable to discuss some of the most important subjects falling within our brief; e. g., it has been suggested that there were many unilateral acts by nations which would reduce tension--e. g., delivery of weapons of all kinds to the smaller nations; deliberately refraining from provocative statements; use of preliminary steps of disarmament for propaganda purposes.

Finally, we failed completely to discuss what could have become our major contribution to this Conference. This was consideration of those long-term problems which will lead to differences between nations when disarmament is finally achieved, and particularly those problems which can be foreseen by men of science who can also suggest solutions. Much progress has been made in this Conference in reaching agreement on the immediate problems of disarmament, but this is not sufficient to ensure that the legitimate long-term goals of mankind are achieved.

Such problems as the estimation of the total resources of the earth, in relation to the needs of nations, require very careful and thorough consideration. Means by which trade is facilitated or world-wide meteorological and communications systems set up and managed, require investigation, and so on.

We suggest, therefore, that those more technical long-term problems of especial human importance, rather than of more purely scientific interest, be coupled with consideration of the sources of tensions in a disarmed world, and be made the subject of a future COSWA Conference.

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to Plenary Session

## II. CONFERENCE PAPERS



# AN APPROACH TO DISARMAMENT\*

Harrison Brown and Amron Katz

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## Introduction

For over fifteen years the United States and the U. S. S. R. have each looked upon the other as being a threat. Since the end of World War II leaders of both nations have recognized that war between us is a possibility. Actions have led to reactions which in turn have led to new actions. The result has been the deadly arms race in which we are now locked, which is spiraling upward ever more rapidly, and which gives promise of destroying us both unless it is stopped.

The leaders of both nations recognize that stopping the arms race is in itself not enough--that steps must be taken to greatly reduce the dangers which existing weapons systems present to us. Today's weapons are sufficiently powerful and they exist in adequate numbers to make it possible for our two nations to cause destruction enormously greater than anything experienced during World War II. It seems clear that not only must the arms race be stopped, but the possibility that any nation might launch a sudden annihilatory attack upon another nation should be eliminated.

More than fifteen years of the cold war have resulted in strong feelings of distrust in America concerning Soviet intentions and actions. One may argue endlessly as to the extent to which this distrust has been rightly or wrongly placed. And it can be further said that there is undoubtedly distrust in the Soviet Union concerning America's intentions and actions. Nevertheless, it must be kept in mind that any broad plan for the elimination of war, upon which our nations might agree, must take this distrust into account.

The element of distrust has probably been in part responsible for the difficulties which have ensued in the nuclear test negotiations as well as in earlier disarmament discussions. It has certainly led Americans to insist upon formalizing techniques of extensive inspection. It has probably led the Russians to resist measures in this area, which the Americans have believed necessary.

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\*The suggestions contained in this proposal are designed to illuminate problem areas and possible solutions. It does not pretend to be a model of a possible treaty. It is hoped that this proposal will stimulate comment and argument, which will amplify everything herein discussed. Out of these talks, hopefully, there will come better understanding which will provide the basis for formal and negotiable proposals.



It is doubtful that the existing distrust can be eliminated quickly. Yet it is clear that agreements aimed at starting us on the path toward a world without war should be consummated very soon. Under the circumstances, it is important that we be frank with each other concerning our fears so that they can be taken into account in the formulation of possible agreements. Agreements should not await the dissolution of distrust--they must be made assuming that the distrust exists. For this reason, each nation should be prepared to go somewhat further than it would like to go in its agreements, in the interest of mollifying the fears of the other.

Disarmament would appear to be an essential aspect of a world without the threat of war. But in the language of the mathematician, although it is a necessary condition, it is not a sufficient one. If we are to approach complete disarmament we must have some concept as to where we are heading. How will a world without armaments function? How will international disputes be resolved? Will a World Court resolve disputes? If so, how will the laws governing the Court be made? Will the laws apply to nations alone, or will they also apply to individuals? What will be the nature of the international security forces? How will they operate? Who will direct them?

These are some of the questions. They are questions which cannot all be answered before we take the first major steps toward disarmament. But they must be satisfactorily answered before total disarmament becomes a reality.

We must also keep in mind the interrelationships between disarmament agreements and agreements involving a number of troubled areas of the world. The destinies of such areas as Berlin, Taiwan, Laos and the Congo and problems such as disengagement in Europe clearly cannot be completely divorced from the broader problem of disarmament. Political agreements must go hand-in-hand with disarmament agreements. Although initial and major disarmament agreements need not await the solution of all of these problems, it would appear that solutions should be forthcoming as disarmament progresses. It may well be that agreements concerning these difficult areas should be an integral part of any comprehensive disarmament plan.

### The Problem of Negotiation

We are living in an age in which the technology of war is expanding with increasing rapidity. Yet the techniques we use in complex international negotiations are virtually the same as those which have been used for hundreds of years.



Today when we negotiate, our respective nations establish "positions" which are often both rigid and far apart. The lack of flexibility in the positions usually results in deadlock. And if agreement is reached at all, so much time may have been consumed during the process of negotiation that the world situation may well have changed dramatically during the intervening period. It is clearly desirable for us to devise techniques which can speed up the negotiating process.

Our failures in negotiation have often stemmed from lack of mutual understanding of each others' problems and of the subject matter involved. Further, the procedures and traditions of negotiations often make it difficult for the negotiators of one nation to educate those of another.

Under the circumstances it would appear desirable that all official negotiations be preceded by detailed, informal and unofficial discussions which are aimed at clarifying the issues and problems involved. These discussions should be aimed at creating common areas of understanding and at delineating those areas where successful negotiation might be possible. They might well follow the pattern of the six Pugwash meetings of scientists which have thus far been held, except that the discussions would be more frequent, or of longer duration and of broader scope.

It is to be hoped that the proposed international study group for the study of disarmament and arms control will make it possible for substantial numbers of individuals from the East and the West to discuss in detail the major problems of arms control and disarmament, create common areas of understanding and designate areas in which official negotiation might be possible. There should, of course, be similar continuing discussions in the more political and less technical areas.

One of the major barriers to disarmament today is our lack of clear mutual understanding of how a world without arms will function. Unless we achieve substantial understanding in this area, really major disarmament agreements will be extremely difficult to consummate. Clearly there should be substantial groups of experts discussing problems such as world security forces, international law, world courts and world organization on a continuing basis.

As stressed earlier, these sessions should be unofficial, informal and continuous. No nation should be bound by the conclusions. None should make use of the conclusions for propaganda purposes. It would be hoped, however, that the conclusions would be used by our political leaders as a basis for international negotiation.

The establishment of such continuing discussions might well be our first major step, and it could well be our most important single step, leading to disarmament.

### Basic Principles

Let us assume, for the purpose of discussion, that the powers succeed in reaching a general meeting of the minds concerning the maintenance of peace in a disarmed world. Let us assume further that progress is made toward the solution of some of the more pressing and difficult political problems which now are major sources of conflict between East and West. Let us assume that within such an environment the Soviet Union and the United States were to attempt to consummate a detailed agreement which, when put into effect, would result in the virtual elimination of military installations and capabilities in the two countries, eventually to the relatively low levels of armaments required to maintain internal order. What form might such an agreement take?

Of course, any meaningful agreement on disarmament must eventually be world-wide. But in view of the fact that the success of any world-wide agreement would be dependent upon the adherence of the United States and the Soviet Union (the two major nuclear powers) it is useful to explore the possible nature of an agreement were it consummated by these two nations alone.

In the formulation of a proposed agreement on disarmament between the Soviet Union and the United States, it is important that we first establish certain basic principles. It is also important that we state frankly the fears on both sides which must be taken into account.

The following basic principles would appear to be obvious:

1. Disarmament cannot take place instantaneously. Time will be required, and it is likely that the elimination of arms will best be accomplished in "steps" or "stages."
2. Given the fact that some sort of military balance exists between East and West today, it is important that the balance not be greatly upset by the disarmament steps as they are taken.
3. The result of the changes, as they take place, must appear to both sides to be preferable to the continuation of the arms race, with its inherent serious dangers.

The fears which must be taken into account in the formulation of a possible agreement can be divided into current fears and



future fears.

Most of the current fears are, in differing degrees, shared by both nations: the fear that mechanical or administrative accident will lead to an unintended war, the fear that nuclear capabilities will spread and lead to war, the fear that intended war will result from conflicts such as that over Berlin. But the Soviet Union and the United States each appears to have at least one fear which is important and which is not shared by the other.

The United States possesses a fear of the unknown--and without more knowledge there is, for most Americans, much to fear in the military position of the Soviet Union. Might the Soviet Union actually be building the 100 megaton superbomb to which Premier Khrushchev referred recently? Are the remarkable Soviet achievements in space being exploited for military purposes, despite occasional statements to the contrary? Approximately how big is the Soviet missile force and could it be used, not in retaliation, but in a first attack on the West? Lack of moderately detailed knowledge concerning these and other factors breeds fear.

The Soviet Union, understandably concerned with its own security, tends to fear American attempts to gain information about its military position. She fears, for instance, that the loss of the invulnerability of her missile bases through intelligence (or "spying") could possibly lead to a planned attack by the United States.

The future fears are related to the current ones. The United States fears that as disarmament progresses, the Soviet Union might clandestinely retain sufficient arms to render considerable damage. Some Americans fear that, with major nuclear striking power eliminated, the Soviet Union might overrun areas such as Western Europe with conventional forces.

The Soviet Union in turn apparently fears that inspection schemes will be used for purposes of "spying" and will result in decreasing the invulnerability of her bases. Also, she fears the consequences of the rearming of Germany.

Any plan for disarmament must take these principles and these fears into account. Certain aspects of a plan which might appear to be essential to one side, might easily appear ridiculous to the other. In this respect, it is of the greatest importance that both sides be tolerant.

It is clear that a detailed disarmament treaty could not be negotiated overnight. Given the most perfect world environment (which we do not enjoy now) many months would be required. In



the presence of world tensions, and given some situations which are potentially explosive, it is important that those major groups, claiming an interest in changes leading to world peace, take stabilizing measures designed to reduce dangers of accidental and unintended war, especially during the process of negotiation of longer-range steps. An unwillingness to come to grips with partial measures cannot possibly produce the kind of world environment conducive to the acceptance of more general agreements, which are bound to carry each state into unfamiliar areas, and which will likely appear to be more dangerous than the prior or current situation.

Confidence in peace-keeping and peace-attaining machinery can come only from successful experience and competence. We must develop competence in devising and using peace-keeping machinery, and this can be done in part via partial measures. If such measures fail, or if one side finds them intolerable, return to the status quo ante is feasible. It is not possible to contemplate construction, execution or maintenance of agreements which one state, or a major group of states find (or believe) is to their immediate and obvious (or long term and possible) disadvantage.

#### A Possible Approach

Although there are many approaches to the problem of disarmament, there are actually very few approaches which can satisfy the basic principles outlined above and which would, at the same time, alleviate the current and future fears possessed by both sides. If the United States and the Soviet Union could agree upon the basic principles, as outlined--as well as upon the fears, as listed--then the possible solutions upon which we might agree are limited in number and kind. One such solution is outlined in general terms below.

This proposal (or approach) is designed to illuminate problem areas and to suggest possible solutions. It does not pretend to be a model of a possible treaty. It is the purpose of this proposal to stimulate comment and discussion, out of which will come better understanding, and hopefully, the bases for formal, more detailed, and negotiable proposals.

The participants from both East and West are urged to examine the proposed stages as objectively as possible and to avoid discarding any specific point until it is viewed in the light of the principles and fears described in the previous section.

It is envisaged that the powers would sign an agreement which would lead to general and complete disarmament in three



specified stages and in an agreed-upon period of time. At any time, depending upon the belief of one nation that another is not acting in good faith, and depending upon the progress which is made on the solution of the major political problems confronting us, a major power may elect to void the agreement.

The first stage would involve the construction and deployment of two nuclear forces, one in the East and one in the West, which are as nearly equivalent as possible and which are subject to identical stringent constraints. These forces would be as invulnerable as modern technology permits us to build them. Each would be of sufficient size to inflict serious damage upon the cities of the opposing nation, were it used. For the purpose of our discussion, as an illustrative example, we will assume that these two striking forces would consist of specified numbers of nuclear propelled submarines, each carrying a certain number of missiles with warheads of specified size, and operating from known bases. In this simple schematic proposal we will ignore, for the present, the very real considerations which argue for a mixed force, including systems other than submarines.

At the end of this first stage (at time  $t_1$  which would be specified in the agreement) the nuclear striking force of the Soviet Union would then consist of the nuclear submarine fleet (of known size to the West, but of high invulnerability) and of her land-based planes and missiles (of unknown size to the West). The nuclear striking forces of the United States would consist of the nuclear submarine fleet (of known size to the East) and of her land-based planes and missiles (of fairly-well known size to the East).

With relatively invulnerable and sizeable striking forces available to both nations at sea, it would then be possible to begin the process of demilitarizing the land areas, as well as that of removing military activity at sea, other than that of the two nuclear submarine forces.

At time  $t_1$  inspectors would be placed at all submarine bases, as well as at all potential bases, for the purpose of ascertaining that only those submarines listed in the agreement were active. This, the first inspection activity under the agreement, would thus be confined strictly to coastal areas.

During the second stage of the agreement, beginning at time  $t_2$  there would take place a complete demilitarization of the land areas, in agreed-upon steps. At the beginning of this stage, each nation would provide a list giving the size, nature and approximate location of all military installations, quantities of bombs and nuclear materials, numbers of planes of various types, missiles and

ships, as well as the nature and locations of factories for the production of military equipment.

Cutoff of production of specified items such as planes, missiles and nuclear materials would take place at time  $t_1$  and inspectors would be placed in all plants to ascertain that this had been done. This would be followed by progressive elimination of delivery systems, warheads, nuclear materials and ground forces according to an agreed-upon procedure which could have any one of a number of forms. As the process of dismantling and elimination of weapons progressed, the system of inspection would be extended further. As national ground forces were eliminated, world security forces would come into existence.

By time  $t_2$  the process of demilitarizing the land areas would be completed and the continuing system of inspection would be in operation. This might include a number of insurances against the clandestine production of weapons--aerial reconnaissance, checks on movements of materials, a network for detecting nuclear explosions, as well as so-called "peoples inspection."

At time  $t_2$ , then, the only remaining military forces would be the two identical nuclear submarine fleets, the comings and goings of which would have been under surveillance during the interval  $t_1$  to  $t_2$ . Starting at time  $t_2$  there would be a progressive removal of these submarines on a one-for-one basis. By some time  $t_3$  the submarines would be eliminated and general and complete disarmament would be in effect.

Clearly the time  $t_3$  is intrinsically more difficult to specify than are  $t_1$  and  $t_2$ . The interval between  $t_2$  and  $t_3$  would be heavily dependent upon the maintenance of the schedules defining  $t_1$  and  $t_2$ . Further, and of greater and critical importance, each side must believe, with high confidence, that the important and difficult clandestine weapons problem has been satisfactorily solved.

Such a program, which has of necessity been over-simplified, would appear to satisfy the conditions established in the previous section. It could lead to comprehensive disarmament. It would appear to quiet many of the fears voiced by both East and West. Under the circumstances it might provide a reasonable basis for negotiation.

The negotiators would have to answer many questions. How many submarines should there be? Would the system be sufficiently invulnerable? What should the time scales be for the three stages? What should be the specific formulae for demilitarizing the land areas and introducing inspection? It seems likely, however, that



these questions, although not simple, could be answered, were these principles and this schematic outline accepted.

### The First Stage

It should be emphasized that our assumption that the Soviet Union and the United States would both be willing to rely upon known nuclear forces based upon nuclear-powered submarines is probably an oversimplification. For example, one or both of the powers might not have sufficient confidence in its technological ability to build sufficient invulnerability into its own system; one or both might have doubts concerning its ability to endow the system with adequate operational efficiency.

It may well be that the powers would have more confidence in extremely hard land-based missile forces, placed at known locations. This system would have the complication that inspectors would have to be placed at known locations on land during the first stage (and excluded from other areas), and that the particular known missile sites would then have to be excluded during the land demilitarization steps taken during the second stage. Although this would be a complicating factor, it does not appear to present insurmountable difficulties.

Similarly, it might be that neither power would wish to rely upon a single system and would prefer to establish a "mixed system" involving some nuclear submarines and some land-based missiles. Plausible arguments against exclusive reliance on one system can be made and are well understood by military analysts. It would appear that this situation, although complicating matters still further, could likewise be handled. In this case, inspectors would be placed both in the designated land areas and at the submarine bases.

One consideration which would determine in part the precise choice of system is the time factor. For many reasons it would be desirable that the first stage be passed through as quickly as possible, consistent with the establishment of systems of high reliability. Although the precise duration of the first stage can be a matter for some debate, for the purpose of more specific discussion and orientation, we suggest three years. This does not appear to be an unreasonable long time when we consider other concurrent steps which should be taken during the first stage and the magnitude of some of the critical political problems which must be solved.

How large should the two nuclear forces be? This, also, can be a matter for some debate. Again, for the purpose of



discussion, we would suggest that the two forces might possess a minimum of 100 megatons of striking power. However, plausible arguments can be made to the effect that the forces should be larger than this, and perhaps even as high as 1000 megatons. The exact power of the two forces can only be negotiated in the light of detailed discussions concerning the natures and efficiencies of the systems which are adopted. Obviously the smaller the power which will reasonably allay the fears of both East and West, the better off we will be.

Striking power in the range of 100 to 1000 megatons appears extremely high to most persons--and indeed it should. But we should remember, that were we to reduce nuclear weaponry to that level, a great deal of nuclear disarmament would be involved. Indeed, were the United States and the Soviet Union to disarm to that level, it would mean decreasing world-wide nuclear stock-piles perhaps 25-fold. Although this would be an inadequate reduction in the long run, it should not be looked upon as a negligible achievement.

We have emphasized that progress toward desirable goals cannot be made in a vacuum. The likelihood of reaching each phase, of progressing smoothly toward the goal, of achieving mutual confidence in the value and significance of the effort, will depend upon our maintaining concurrent stability in the world. For this reason, it is desirable to consider certain measures, concurrent with the first stage, which are designed to reduce the danger of accidental or unintended war, to prevent the militarization of space, to promote continuous and joint research and development exercises on inspection technology. These are obvious suggestions which need be part of a longer list, and which are aimed at providing a firm base of experience and confidence from which to take the large step into stage two.

The establishment and training of an inspection force, which cannot spring into effective operation overnight, and the establishment of adequate communications systems, would be desirable before the second stage begins. Confidence in inspection forces and technology is more likely to result from the development and testing of techniques and personnel during a period preceding their use than from sudden deployment without such experience.

Further, realism demands that problems of possible evasion of the agreements be faced. Ignoring problems of evasion will hardly be expected to yield systems which take them into account. These problems cannot be worked on effectively if efforts are confined only to committees or to study groups, but should be worked on by realistic simulation in inspection field exercises.



The purpose of concurrent and partial measures, such as the few briefly noted above, is to reinforce the velocity and confidence with which the second stage is reached and entered. We have given a fixed, but arguable, time period for the first stage; but it is hardly conceivable, and in fact contrary to the principles discussed earlier, that either side will enter the second stage if it is completely dissatisfied with the situation at the end of the first stage.

### The Second Stage

The length of the actual disarmament process envisioned in the second stage is arguable and negotiable. Because we believe that a stated time is a good beginning point for discussion, we suggest that the second stage should last approximately four years.

With inspection and monitoring of the two symmetrical nuclear forces already operating at the beginning of the second stage, the simultaneous introduction of disarmament and inspection over the remaining forces would begin.

There are various methods by which this process could proceed over the four year period and there is no apparent preference herein indicated. Whether the process should proceed by complete disarmament of successive areas, whether gradually and simultaneously over the entire area, whether by successive classes of weapons (e.g., nuclear weapons, conventional weapons), whether by type of delivery vehicle (missiles, aircraft, naval vessels, ground vehicles), whether by production plants or stockpiles of various types--are all discussable and important questions. Any detailed proposal must meet the criteria advanced earlier, and in addition should meet further criteria, such as being inspectable and minimizing the total inspection effort.

Agreement on, and confidence in, the inspection forces deployed in the first stage should minimize fears and concern with the inspection system which is activated during the second stage. We have proposed that aerial surveillance systems will be fully operational by the end of the second stage. Their rate of introduction, their extent of use, their phasing with the other inspection and disarmament processes, are discussable and not herein specified.

What is important is that each state must act in such a way as to convince the other states that it is desirable to continue the agreement and the disarmament process. Were the reverse the case, a state might find that its interests demand abrogation of the

agreements and cessation of the process.

Although the major problems to be encountered during the second stage would appear to be soluble, it is still a difficult and insufficiently explored area. Here again, experience and experiment may likely contribute more illumination than can be gained from discussion alone. We again urge careful and early consideration of experiment, development and testing of the appropriate technology.

### Conclusion

On the assumption that the several stages are passed through expeditiously, with confidence and with the accompanying satisfactory solution of major problems such as that of clandestine weapons, we would end with the powers living under a condition of general and complete disarmament approximately ten years following the signing of the agreement. When we consider this time span in terms of the magnitude of the problems which must be solved--and in context with the fact that fifteen years have passed since East and West started along the path which has led to the present dangerous situation--ten years does not appear to be an unreasonably long time.

This paper cannot and did not treat all of the critical problems involved in the establishment of a reasonable disarmament scheme within the context of the current world situation. We view this paper merely the beginning point of a series of formal and informal discussions. It is hoped that these discussions will amplify and illuminate everything herein discussed, and more.

We have attempted to formulate these suggestions keeping in mind both American and Soviet concerns as we understand them. We hope that our Soviet colleagues in their criticism of these suggestions will be as explicit as possible concerning the reasons for their disagreement on specific points. And in particular we hope that they will conduct their criticism in the light of the basic principles and fears which we have listed in the third section of this paper. What, if anything, should be added to, or subtracted from, that list? If progress is to be made, the premises upon which proposals are made must be realistic and understood by all parties concerned.



## DISARMAMENT AND THE GERMAN PROBLEM

### --A Proposal on Regional Disarmament in Middle Europe--

Gerd Burkhardt

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#### I

In recent weeks it has again become evident that the Berlin problem represents a grave danger to peace in the world and that the solution of this problem is a most urgent task.

One cannot state that the past 10 years have brought us even one step nearer to a solution; on the contrary, the tensions have become stronger and stronger. In both parts of Germany the arms race is progressing; it is accompanied by a violent campaign in the newspapers and other means of mass communication; thus, contributing to enlarging the gap between peoples who for centuries have had a strong feeling of solidarity. The very unstable special status of the City of Berlin, as it was established at the Yalta and Potsdam conferences, has deteriorated more and more, as each of the two German states tries to push its claim to the respective part of the city as belonging to its jurisdiction. The special status is practically canceled, since the government of the German Democratic Republic has blocked off the East sector from the Western parts of the town. Though I am convinced that this step was a necessary consequence of the foregoing political evolution and could have been expected, yet it certainly is to be regretted in the interest both of the East and the West--not only of East and West Germany. Definitely, it did not bring us nearer to a solution, but it made apparent the urgency of the problem. Unfortunately it also made apparent in my opinion, the failure of the policy, pursued by the German Bundesregierung during the last 10 years, a policy of strength in order to enforce from the East a more conciliatory approach to negotiations.

#### II

Is there any possible solution of the problem at all? To be sure, there exists no isolated solution of the Berlin problem; it is closely connected with the problem of re-unification and must be seen in this connection. As in both parts of Germany there exist different social orders a fusion into one state is only imaginable, if in one part the now existing order is given up in favor of the other. It is quite easy to understand that the political leaders on either side hope to get the other side to give up its social order. But it is just as clear that a unified Germany belonging to the western pact system is just as unacceptable to the Soviet Union as the reverse to the Western world. This obviously means that a plan of re-unification

in the manner described here, in the near future and presumably for a rather long time, is quite unrealistic. It seems to me important that all illusions in this respect should not be further sustained in the German population.

But it is wishful thinking, too, to let the German people choose themselves by autonomous decision their own form of government, and to believe the problem could then be resolved. I am absolutely sure, such a vote would show a clear and convincing majority in favour of the western democratic form of government. I want to state this as a mere fact and not as a judgment about the value of the two systems--I may add in parenthesis, that in history the German people have not always voted in favour of the more valuable system! To prove my statement I mention only two points which would sufficiently determine the result of the vote: the traditional distrust of communism, which at least since 1918 is very deeply rooted in the German population with its tendency to conservative authority, and secondly, the quite different standard of life, existing also in the broad mass of the population, which is of course not conditioned entirely by the different social systems.

In discussions with Russian friends, I found that they admitted the truth of my statement. Their argument was, that just for these reasons East Germany must be blocked off from its capitalistic neighbors, to keep off all disturbing influences from outside which would impede the continuous evolution of a new and, according to their belief, better social system in this part of Germany. After some years of steady evolution, in their opinion, the result of a ballot in Germany would be quite different from now. Here we have the nucleus of the Berlin problem, and why Berlin has such a vital importance for East Germany, "the bone in the throat of the socialistic countries."

Indeed, there is something in this argument but pursuing this policy would lead to the definite splitting of Germany; though both systems would be stabilized in their part of the country, I cannot admit that this would be an acceptable solution of the German problem. Re-unification is a legitimate demand, which again and again would create disturbance in the affairs of the world, which is not in the interest of either side. Just as a symbol of the national unity of Germany the special status of Berlin must be maintained. Moreover, the West cannot simply abandon a promise given repeatedly to two million inhabitants of West Berlin, it has invested much prestige in this city. Indeed, the problem seems only to be solvable in a larger framework.

### III

Such a larger framework could be a comprehensive peace treaty with both parts of Germany, as repeatedly urged by Premier



Khrushchev, in connection with a regional disarmament agreement in Middle Europe.

Proposals for a disengagement of the two big power blocs have repeatedly and in different ways been made since 1954 by Eastern and Western politicians. I just mention the names Eden, Gaitskell, and Rapacki, without going into the details. The proposals I would like to submit to this conference, have been worked out in the main by Helmut Schmidt, member of the Bundestag in the social-democratic fraction and expert on military problems, in connection with the above mentioned plans. They are described in his book, published 1961, entitled Defense or Retaliation which will soon come out in an English version. At first only a few particulars as to the military situation of today, the data are given in the above cited book:

In East Germany there are about 20 Soviet divisions and six divisions of the German peoples' army under arms; in Poland, 13; in Czechoslovakia, 14; in Hungary, four native divisions; about six Soviet divisions are additionally stationed in Poland and Hungary. This makes altogether more than 60 divisions in the countries of the Warsaw pact, belonging to Middle Europe. In the NATO countries of Middle Europe we have five U.S., three British, and two French divisions, stationed in West Germany, besides seven divisions of the German Bundeswehr; moreover, one native division in Denmark and two both in the Netherlands and Belgium; that is more than 20 divisions on the Western side in Middle Europe. Of course, only a numerical comparison, without taking into account the many other factors of military importance, is not sufficient. The superiority in manpower of the East may in part be compensated by a stronger nuclear armament of the West. In any case, the numbers make evident the dimensions of a conflict, if it should come to an armed contest in this region; in German territory alone more than one million soldiers are now standing under arms.

The proposed zone of arms limitation should comprise the territories of West and East Germany, of Poland, Czechoslovakia, and perhaps also of Hungary. The areas of these territories West to East are in the proportion of 1:2 (F.R.G. 250,000 km<sup>2</sup>; Poland, 310,000 km<sup>2</sup>, CSR 130,000 km<sup>2</sup>; D.D.R. 110,000 km<sup>2</sup>). Nearly in the same proportion are their linear dimensions, taken from the dividing line: 300-400 km to the West; 800-1,000 km toward the East. The numbers of the population on both sides are nearly equal: 53 million on the Western side against 58 million in the East. Regarding the industrial and economic potential, the Federal Republic of Germany has the clear superiority over the four states of the Eastern bloc.

The military limitations must be carried out in such a way that no change in the balance of power, threatening the security of



one side, takes place.

Schmidt's proposal starts from limiting the manpower of the Bundeswehr to 300,000 men. The proportion to the respective powers of the other armies should be: to Poland as 3:2; to the German Democratic Republic as 3:1; and to the CSR, likewise 3:1. It follows that the proportion of all forces between the Western and the Eastern part of the zone would read 3:4 or, including Hungary, about 3:4, 5. All these troops must be exclusively armed with conventional weapons.

The installation of such a zone of arms limitation requires an international control system which supervises the strength and types of the admitted weapons. Some of the most difficult problems of a world-wide inspection system do not exist in this zone, such as the detection of hidden nuclear stockpiles; therefore, inspection is much easier. The system could serve as a model for other international arms control systems and many experiences for more comprehensive and far-reaching ones could be gained. After this first step has been accomplished, which I think could be achieved during one year, it should be followed by the withdrawal of all foreign troops, stationed in the zone, which would then become completely free from all nuclear weapons. This should be done in connection with the conclusion of the peace treaty with Germany, whilst the peace negotiations could immediately begin. They should be carried on independently from the negotiations about disengagement, but the peace treaty should become operative not before the above mentioned first step of arms limitation with its system of inspection is completed.

It must be prevented that in one part of Germany a rebellious movement tries to overthrow the existing government with the moral or material help of the other part, because this would seriously disturb the established balance of power in the zone. Therefore, some troops of the USA and the USSR should stay in Germany for some time; also in the second phase, though their military value may be only symbolic.

They could be replaced after a period of transition by a police force of the U.N. Moreover, there should be stipulated by treaty the possibility of "re-entry" for the foreign troops, if one of the countries of the zone feels its security threatened.

There are numerous objections against such an agreement, both military and political, which are discussed in detail in the above mentioned book of Schmidt. A frequently heard objection says that the U. S. A. would withdraw their troops from all of Europe as a consequence of such policy of "neutralization." This indeed would mean a serious shift of the balance of power in Europe. The plan proposed here provides for the American troops to remain stationed beyond



the Western frontier of Germany which, of course, makes necessary the consent and cooperation of the neighbouring nations, especially of France, to the disengagement plan. Objections from the point of strategy against diminishing the depth of the strategic area by the exclusion of the Bundesrepublik have been disproved by several military experts. To take off the nuclear weapons from the first front-line requires some re-arrangements in the strategic planning of NATO, but military disadvantages, if any, are surpassed by decisive benefits. These objections all regard the disadvantages of the plan for the Western world; at the same time they often are followed up by the allegation that the USSR would never agree with it, which in this connection is not very convincing.

#### IV

The peace treaty with the two parts of Germany has to create the political disengagement and stabilization in Middle Europe. It will contain the renunciation by Germany as to the former German territories beyond the Oder-Neisse line. A German myself, I may add that this renunciation is a real distressing one for all Germans and especially for those who had their homeland there. But the Germans must recognize that it is a consequence of the war, initiated by Germany and they must learn to accept these consequences.

If thus Germany succeeded in gaining after all friendship with its Eastern neighbour countries, in spite of all those terrible things that happened there during the Nazi occupation, the loss of these territories would be outweighed by this gain.

The peace treaty cannot cancel the partition of Germany, the two parts of Germany even should further remain partners of their specific alliances, West Germany of NATO, East Germany of the Warsaw pact. Too early a neutralization of this territory, without neutralizing the ideological antagonism, would create a dangerous instability. Moreover, the political and economic integration of Europe must be kept in mind, the partnership of West Germany could not be abandoned without jeopardizing all efforts for European integration.

The special status of Berlin should be maintained until this city can again take its role as the capital of a re-unified Germany in a later future. This special status could be emphasized, if Berlin would become the residence of the international control commission for the whole zone. A perhaps more satisfying alternative to the partition in four sectors would be the status of a free city under administration of the U.N., the free admission from all German countries ought to be fixed by the treaty.



The treaty should also bind the two German governments to take up negotiations with the aim gradually to reduce the gradient of the standard of life and of currency and, at the same time, step by step to release the restrictions of tourist traffic between East and West Germany, within a given period of about three or five years after the treaty has been signed. Certainly one of the main reasons for the problem of refugees is the fear of getting finally isolated from West Germany. One must not forget that nearly all inhabitants have points of relationship on the other side. An unrestricted travelling, I suppose, would tranquilize very soon the fluctuation of population after some initial oscillations.

This indeed requests rather far-reaching contacts between the two governments and apparently means a de facto recognition of the East German government. I cannot see how this step which our government so eagerly refused to do, can be avoided. It could be made easier, if the exponents of the hitherto practiced politics on both sides would be relieved by other politicians. This might happen in West Germany at the next election of the Bundestag, though it is not very probable; a corresponding change in the leading personalities in East Germany could help to tranquilize the contest and to convert it into a peaceful competition.

Then perhaps the time will come to elect by ballot in East and West an all-German government. This must be connected with a new, drastic reduction of the armed forces in Germany and both parts will have to leave their respective military alliance. Germany, in this way re-unified in a disarmed Middle Europe, would be no longer a danger for its neighbours. This country, which according to the words of its historian Friedrich Meinecke, 1945, was an "out-burned crater of power" never again can enter the claim to imperialism. Situated in the midst of Europe it can form a bridge of spiritual exchange between the West and the East, just living its own way of life. What would this way look like?

I think it was very encouraging to hear the Vice-Premier of the Soviet Union Mikoyan declare in an interview with the press just some weeks ago, that even a Germany which had decided in favor of the capitalistic system, could be accepted by the Soviet Union. Encouraging, I think, because I myself hope--and why should I conceal it--that the German people will decide in favor of the Western democratic form of government. But we should not prophesy and anticipate decisions which must be met by the following generation. However, it is our duty to create now the conditions which make it possible for them to decide and not to leave them a devastated world!



PROBLEMS OF THE CESSATION OF PRODUCTION OF FISSILE  
MATERIAL FOR MILITARY PURPOSES AND THE ELIMINATION  
OF WEAPONS STOCKPILES

Sir John Cockcroft and Sir William Penney

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Introduction

Among the problems of complete disarmament those associated with nuclear weapons must command the most careful and continuous attention. There is unfortunately little or no possibility that scientists will be able to devise a technical control system which could by itself guarantee that no fissile material is being clandestinely directed to a weapons programme. Unfortunately also, scientists will not be able to devise a technical control system which could guarantee that those nations with nuclear weapons have not kept a secret stockpile of weapons whose size is an appreciable percentage of the declared stockpile. Since technical methods have thus their limitations, additional methods must be sought. These other methods will not be scientific and it is probable that their dependability is not ascertainable in numerical terms.

In this paper some preliminary thoughts are expressed about the possibilities of international control of the production of fissile material, and of the accuracy with which a Control Organization could guarantee the declared balance sheet of the fissile material in any country. The declared balance sheet for the integrated total output of fissile material would show the total quantities of fissile material made, the quantities used or held by the civil programme, the quantities made into weapons, the quantities used in weapons tests and the quantities used or held in military devices such as propulsion units.

The problems of the running control of the production of fissile material divide into those of the production of enriched uranium by physical means, and those of the production of plutonium (and U 233 and possibly tritium) from nuclear reactors and processing plants. The problems of the reduction and elimination of stockpiles of nuclear weapons and other military nuclear devices have many features in common with the problems arising in the running control of the production of fissile material.



## Physical Means of Separation

Physical means of separation are at present used to obtain large quantities of enriched uranium. In principle, the separation could be done in several ways, but, so far as is known, the only production plants operating at the moment are in the United States, Soviet Russia, and the United Kingdom, and these are gaseous diffusion plants. The centrifuge method of separation could also be used, but the only published statements so far made suggest that further development of the centrifuge method would be required before a production plant could be built.

A disarmament treaty should include a declaration by all Signatories of the locations, and current and past outputs, of their diffusion plants. All records from the start of operation of the plants must be available for inspection, as well as those of associated plants which supply them with uranium, electric power and other supplies. The declarations of current output and previous production would then have to be verified as closely as possible by inspection of the plants, of the records, and by interrogation of staff who have worked in the plants. Firm provision for such inspection and interrogation should be an essential requirement of the treaty. Records of the interrogation should be kept and false statements should be made a serious offense under international law.

It would be necessary for the Signatories to agree on the output of enriched uranium required for the civil programme of each of the countries concerned both for domestic and export programmes. It is possible that civil needs could be met for a time from existing stockpiles of fissile material which had been set aside for military purposes. In this case, existing plants could be closed down for a period and the task of inspection might be made simpler. Alternatively, it might prove that one or two of the plants now existing in the world could produce enough additional enriched uranium to meet for some time the civil needs of the world, in which case these plants could be operated under international control and management, and the other plants taken out of commission until such time as world demand for enriched material for civil purposes required the re-opening of some or all of them.

The running control of a diffusion plant would require the Control Organization to be able to take such samples and to conduct such laboratory tests as the Control Organization thought necessary. The Control Organization must also have access to full plant records at all times. Satisfactory arrangements must be made for the control of the enriched material both in the stock room and during transit from the plant to the places where it is to be fabricated or used. Provided that all necessary steps of these types were taken, the current output of any plant could be controlled by the Control Organization with an accuracy of the order of one per cent.



The output of a plant up to the time at which the Control Organization is installed presents a different problem. It is difficult to give a reliable estimate of the accuracy within which the Control Organization could guarantee its estimates, and the estimate might vary from country to country. The output of each of the existing diffusion plants will probably have been a closely guarded secret, known only to a few individuals. Some of the true records of any one plant, and of other supplying plants, could have been replaced by false records. Dates of changes of power or improvements in performance could have been falsified both in the plant and in the electricity supply organization. Losses of output due to stoppages could have been invented or exaggerated. The Control Organization might well conclude then, that the integrated output up to the time at which control started could not be guaranteed by them as having better than an accuracy of the order 10 per cent. The initial call on fissile material would have to be based on these initial estimates.

The Control Organization, having been given the integrated output of a diffusion plant and having established some figure of reliability, would need to check what part of this output had been sent to the civil programme. This would require careful checking of the records of all the places where the material had been used for civil purposes and a verification that the material of the declared enrichment had in fact gone to the declared place. It is unlikely that the Control Organization would be able to guarantee the accuracy of the over-all figures provided within an accuracy of better than a few per cent.

Some fissile material may have been used in military propulsion units and some may have been used for other military purposes. A declaration by the country owning the diffusion plant would have to be made of the quantity of enriched uranium used in military projects, other than weapons, and means must be found of checking the validity of such statements.

A declaration would also have to be made of the total quantity of enriched uranium used in nuclear weapons tests. Here the Control Organization will have no means whatsoever of checking the accuracy of such statements. On the other hand, the quantities of enriched uranium used in such tests are small compared with the quantities in the weapons stockpiles. Thus, the maximum extent to which a potential violator could cheat on his declaration about weapons tests would be roughly comparable with the total quantity already used by him in tests.

As a simple matter of arithmetic, if the total quantity of enriched uranium made by a country were greater than the declared



quantity by 10 per cent, and if the quantity used by the civil programme was correctly declared, then the clandestine military stockpile could be greater than 10 per cent of the declared military stockpile. For example, if the civil side actually had taken one half of the total production, the clandestine military stockpile would be 20 per cent as large as the declared military stockpile. Since there is an opportunity for some degree of cheating by overdeclaring the quantity used by the civil programme and the quantity used in weapons tests, a few per cent would have to be added to the 20 per cent just mentioned. Whatever conclusions a Control Organization would reach about the maximum degree of uncertainty it could guarantee about the size of possible clandestine stockpiles of weapons, there seems to be little doubt that the limit would be a substantial fraction of the declared stockpiles.

Reasons are therefore seen for thinking that with a control system similar to the accounting system now used, the current output of a diffusion plant could be controlled with an accuracy of the order of one per cent. In contrast, the total output from the plant up to the time when detailed control began is at least of an order of magnitude less reliable. There must also be some uncertainty in the balance sheet showing that part of the total output which has gone for civil purposes. It is impossible for a Control Organization to guarantee that the declared quantity of enriched uranium in the weapons and other military nuclear devices in any country is the true quantity. It is thought that even if the nuclear weapons and other military nuclear devices in any country were broken down, and the fissile material produced for the Control Organization to inspect before the material was stockpiled or used in a civil programme, there may still be a clandestine military stockpile which is 10-20 per cent of the declared military total. In the case of countries with large diffusion plant outputs this could mean the retention of a large number of undeclared weapons.

#### Materials Made in Reactors

The principal weapons material made in reactors is plutonium, but U 233 and tritium can also be made in reactors and either might have applications in weapons.

It would be necessary for declarations to be made of the existing quantities of these materials and of those used in nuclear weapons and other military devices. As with enriched uranium, a balance sheet must be produced showing the total quantities made and the quantities used both in the civil programme and in weapons tests. The Control Organization must be given access to all plant records and other necessary data in order to establish the reliability of the



information provided and to assess the possible limits of concealment. As in the case of enriched uranium, there would be a margin of uncertainty within which the Control Organization would be unable to guarantee the accuracy of the quantities declared to be in the weapons stockpile or other military devices. It is difficult, if not impossible, to be sure what the percentage limits of accuracy would prove to be, but they are almost certain to be less precise than limits ascertained on production of enriched uranium.

Reactors engaged solely in plutonium production for military purposes and not producing electrical power could be closed down. Reactors used for electricity production could continue to operate but would become subject to inspection and control by the Control Organization. Reactors which had been built for military propulsion units would either have to be broken down or used for civil purposes under the control of the Control Organization. Experimental reactors, material test reactors and prototype reactors operating to obtain data for the design and construction of civil nuclear power stations, would also be subject to inspection by the Control Organization though these are of minor importance. It would be necessary to evolve methods by which the Control Organization could obtain the data which it required for its disarmament control purposes without at the time prejudicing the confidential nature of advanced industrial technology being developed in order to improve the performance of civil power stations.

The most important control point on plutonium would be the plutonium chemical separation plant. There are two of these in the United States, one in the United Kingdom, one in France, and at least one in Soviet Russia. It is likely that each of these countries would wish to continue the operation of its chemical separation plants in order to extract the plutonium produced by civil nuclear power stations for burning in other civil nuclear power plants such as fast reactors. The operation of plutonium chemical separation plants, where the problems of accurate control are more difficult than those connected with diffusion plants, would need to be closely supervised by the Control Organization. For instance a nuclear power programme of 10,000 MWe would produce about 5 tons of plutonium a year. If production could be controlled to one per cent, the maximum clandestine removal could still be about 50 kg. per year; sufficient to make several nuclear bombs of primitive pattern each with a yield of several kilotons.

It would therefore seem to be desirable to place chemical separation plants under international management with a strong physical security organization so that the possibility of physical diversion would be much reduced. Since a large part of the existing accounting staff might be employed along with a number of senior inspection staff from other countries, this will reduce the time



required to introduce the control system.

#### Subsequent Control of Fissile Material

A serious problem is that of complete accountability in the subsequent uses of plutonium and enriched uranium. These materials will be present in several countries in large quantities and will be constantly moving about between fuel element fabrication plants, reactors, chemical separation plants and research establishments. At each processing point, some material will appear in the form of scrap and will have to be recycled to make it usable. Unavoidably, some low level scrap is not worth reprocessing, and will be stored. The exact contents cannot be directly measured.

All factories and plants engaged in such work, and all research establishments using fissile material, already have accountability systems as a routine plant management matter and also to guard against criticality accidents. These systems would be subject to inspection by the Control Organization. The problems of inspection and verification would be elaborate and need large numbers of staff.

#### Detection of Undeclared Plants

The problems mentioned so far involve mainly technical consideration centered around declared plants. The problem of detecting undeclared plants involves much wider issues. In a general disarmament treaty, there must be full freedom of access for international inspectors into plants and military establishments, both nuclear and non-nuclear. With such open access, the detection of clandestine diffusion plants would not be difficult since the large plant buildings and large power inputs would be difficult to conceal. Detection of small scale centrifuge plants, if such could be built, would be more difficult. The detection of clandestine reactors and chemical separation plants involves a competition between the technical methods, such as environmental surveys available to inspectors on the one hand and the measures taken to conceal the plants on the other.

#### Conclusions

Disarmament would necessarily require the cessation of the production of fissile materials for military purposes and the elimination of existing nuclear weapons and other military nuclear devices. An elaborate Control Organization might succeed in controlling the production of fissile material with an accuracy approaching one per



cent. The clandestine diversion of one per cent of the production of fissile material in any country with a large nuclear power programme would be enough to make a few primitive kiloton nuclear weapons each year. However, in those countries already possessing nuclear weapons, it seems certain that a Control Organization could not guarantee that the quantities of fissile materials declared under a disarmament treaty to be in the weapons stockpiles were accurate. It is thought that there could be a secret stockpile of weapons containing approximately 20 per cent as much fissile material as the declared stockpile. The Control Organization could only reach a conclusion about the limits of accuracy with which it could give guarantees about each particular country when it had made a full investigation in that country.

The concept of a large Control Organization which has the right of access not merely to all declared nuclear installations but to any installation of any type in all countries throughout the world is at present inescapable in the context of complete disarmament. Such a Control Organization might require scientific and technical personnel of the order of 10 per cent of that now engaged in military work in these fields. A Control Organization might deter the future clandestine manufacture of nuclear weapons, but the Organization could not guarantee that there were not secret stores of substantial numbers of nuclear weapons remaining from the nuclear weapons already existing.

## THE DISARMAMENT SITUATION IN SEPTEMBER 1961

Paul Doty

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I greatly appreciate the opportunity of speaking at the opening of this Conference as I did last December on the current situation in disarmament. Now as then, my remarks represent only my own opinion, and I am sure that differences will be expressed even by my own American colleagues. Indeed my purpose is simply to initiate a conversation on the central problems of this Conference by commenting on what has, in my view, happened in disarmament since the Conference in Moscow last December.

Despite the peacefulness of this setting here in Vermont and the friendly spirit that has marked last week's Conference, we are gripped in a rapidly worsening international situation whose dimensions and risks should not be underestimated. The resumption of nuclear testing by the Soviet Union on September 1 has brought to an end the one disarmament negotiation that was in progress. The result has been a renewal of the Arms Race in its most dangerous sectors. It has destroyed an unexpressed confidence between the Soviet Union and the United States that will take a very long time to repair. And, in the words of Premier Nehru, "The danger of war has been enhanced by the decision of the Soviet Government . . . ." I cannot disguise my own sense of alarm. I believe quite simply that with the resumption of testing, we have entered on the most dangerous period of history and that still worse situations lie ahead. The special contribution which the renewal of nuclear testing can make to the deterioration of the international situation was made clear to us last December by Academician Federov who said, "Our Conference should warn all those seeking to resume nuclear weapons tests that this step would irreparably harm the cause of peace . . . . and would throw us too far back on the way to the solution of one of the aspects of the disarmament problem." Well, that harm has now been done and we must ask ourselves what we can do about it here this week.

It seems to me there are three courses open to us. We can repeat to each other what is being said in our respective presses: This would accomplish very little. Or we can give emotional evaluations based upon selected facts: This would lead to a rising spiral of dissent and accomplish nothing. Or we can behave as scientists should. We can try to reach some common understanding of the nature of our problem, that is, the danger we are in, how we got here, and what can be done about it. In the past we have been able to reach agreement on a large body of facts and their meaning, particularly in the Vienna Declaration of 1958 where the specific items included the



necessity to end wars, the requirements for ending the arms race, the meaning of modern war, the hazards of bomb tests and the responsibility of scientists. Despite the present difficulties, it seems to me that we must pursue this same goal with the same sense of responsibility and integrity. I sense that most of Professor Khvostov's remarks pointed down this path and I urge that we travel it together. Here in this room we have a microcosm of the world outside. Let us use this opportunity to the fullest. If we cannot communicate effectively here, what hope is there?

In the broadest sense the situation before us has an almost unchanging character. We have on the one side the immutable need and the common desire of the East and the West in avoiding war. Opposed to this, on the other side, we find three dangerous delusions which give rise to misunderstanding and when they become further intensified in periods of crises, they nurture the Arms Race. The three delusions are (1) the feeling by one side that the other has little or no reason to fear it since it has only peaceful intentions; (2) the feeling by one side that the leadership of the other is evil and wants war; and (3) the feeling by one side that in such a situation the leadership of the other side cannot be believed. It is the exaggeration of each of these delusions that can lead to war and it is by candid and thoughtful discussion that they can be reduced to their actual dimensions where reason can prevail.

Let us now return to last December. Those of us who were together in Moscow at that time can recall the spirit of that meeting. We were on the eve of a new Administration in the United States, and it was the hope of all of us, I believe, that this rare opportunity for a new accommodation between the East and the West could be grasped. We had many discussions, both in our sessions and in private, which seemed to lead to a certain consensus. It was emphasized that a period of three to four months would be required by the American Administration to formulate its own policies in many areas. During this time, it would be advantageous to all if the international scene was not troubled. But even if a tranquil period could occur, it was clear that some significant point of agreement would be needed within a few months if an actual improvement in East-West relations was to get under way. The obvious candidate for this first significant point of agreement was the successful negotiation of a Treaty to Ban Nuclear Tests. Such a concrete accomplishment would have given evidence that in areas of common concern the major powers could negotiate agreements and, furthermore, it would have given hope that major disarmament steps could be taken up in an atmosphere of rising expectations.

One did not have to wait many months to see that history did not unfold in this manner. Within the first two months events in the Congo and in Laos revealed a steady Soviet pressure favoring the extension of their influence into areas where it had not previously existed. Thus the international scene did not remain tranquil. Nevertheless, the promise of a Test Ban Treaty remained undiminished. Consequently, throughout the first two months a reappraisal of the position of the United Kingdom and the United States was carried out. Of course, looking back on the past two years of negotiations on this issue, many mistakes could be seen and on both sides causes for misunderstanding were not few. But great progress had been made and hence there was considerable hope that a renewed effort could overcome the remaining obstacles and bring the conference to a successful conclusion. Every item of disagreement was examined with regard to accommodation and in nearly every case, one was found. Ambassador Dean resumed the Geneva discussions on March 21 by presenting a new set of proposals designed to meet the remaining Soviet reservations. These proposals were as follows:

1. To reduce the number of on-site inspections in each of the nuclear countries to a possible 12 per year, depending on the number of suspicious seismic events.
2. To reduce the number of control posts on Soviet territory from 21 to 19.
3. To extend from 27 months to 3 years the proposed moratorium on smaller underground tests and the associated research program.
4. To institute means for a ban on all nuclear weapons tests in space.
5. To ask Congress for legislative authority to permit Soviet inspection of the internal mechanism of the nuclear devices used in the seismic research and peaceful uses program.
6. To accept the Soviet request for a veto over the annual budget of the control organization.
7. To accept the Soviet demand for parity of seats between Western and Soviet bloc states on the top Control Commission.

Instead of welcoming this attempt to resolve outstanding differences, the Soviet Union responded with the retraction of an earlier



agreement in which it was stated that the use of a single administrator would be acceptable if parity were granted in the Control Commission. In retrospect it appears that this introduction of a completely different requirement in the control administration, after the Western side had accommodated the earlier Soviet demand, represented a deliberate attempt to prevent the concluding of a test-ban treaty.

The "troika" proposal meant, of course, that each nuclear power would have a veto over every administrative act of the control organization except for the somewhat illusory rights of inspection within the annual quota. In advancing this proposal against the idea of an impartial administrator, Soviet policy underwent a startling reversal. Early in 1960 Mr. Tsarapkin had assured the delegates that "out of the three billion human beings on earth we shall always be able to find someone on whom you and we can agree," and again, "In neutral countries it will always be possible to find a person, a really neutral person, who can be used for the job of carrying out the duties of administrator." But now in March, 1961, after making the accommodation on parity which the Soviets had demanded in order to reach agreement on the administration, we find that Mr. Tsarapkin says that, "It is impossible to find a completely neutral person."

Perhaps no man can be completely neutral in his innermost thoughts, but many men have disciplined their innermost thoughts to make possible the equitable adjudication of particular cases; it is this neutrality in deed which underlies systems of justice everywhere in the world, including the Soviet Union. It underlies the whole philosophy and practice of science and it equally underlies the effectiveness of international organization. Every day dedicated men in the United Nations and other international bodies demonstrate that loyalty to their own states does not interfere with loyalty to a community of nations. Of course, we know that the Soviet Government argues that its "troika" proposal is now needed as protection against arbitrary acts of the single administrator. But under provisions of the treaty already accepted by all sides, the administrator is made accountable to the policy-making Control Commission and can work only under its continuous supervision. His appointment and the appointment of his first deputy are subject to Soviet veto. Last month the additional concession was offered that would permit the removal of the administrator during his term of office. Furthermore, decisions as to the annual budget and the amending of the treaty itself remain subject to Soviet veto.

In view of all these safeguards one is, I believe, entitled to ask if the Soviet Government really fears that it would be at the mercy of a single administrator. No, the new reason that the Soviet Government raised to obstruct the conclusion of a test-ban is not convincing. Instead, this must be viewed as an excuse to cover a more deep-lying reason. But this is not the place to pursue what



these deep-lying reasons might be. The important point is the facts surrounding the resumption of nuclear testing by the Soviet Government. I have gone over the matter relating to the Treaty negotiations in some detail for I think that if we are to maintain a respect for fact in our discussions the record must show the extensive Anglo-American efforts to accommodate Soviet views that have gone on during the last six months. And the record must also show the nature of the efforts used by the Soviet Government to block such agreement while it was preparing for the series of massive nuclear explosions that are now under way.

Now we must turn to assess as best we can the new situation that has been thrust upon us during these past ten days. A preview of the new situation was given us last year when Chairman Khrushchev said "Should any of the states, in the present-day conditions, resume nuclear weapons tests, it is not difficult to imagine the consequences of this act. Other states possessing the same weapons would be forced to take the same road. An impulse would be given to resume nuclear arms testing . . . under any conditions, and unlimited by anything."

This is a clear prediction that the other nuclear powers will follow the Soviet lead, including the exploding of large weapons to retreat to the conditions of wide scale nuclear testing that prevailed in 1958. It is, therefore, proper to re-examine the response these Conferences took to the nuclear testing that was going on at that time. In the Second Pugwash Conference, Professors Kuzin and Pauling presented their estimates of the extent of damage produced by atmospheric testing. They were in general agreement: This could be summarized, very approximately, by the statement that with reasonable assumptions in areas where experimental data are scant, roughly 100,000 individuals will be significantly affected in an adverse way for each 10 megatons of fission. These effects include bone cancer and leukemia as well as genetic changes which lead to a range of defects from stillbirth to various kinds of life-shortening, inbred damage in generations yet to be born. These conclusions were considered with some skepticism at the time, but with further study they have come to represent a general consensus although the uncertainty of the estimate remains large. The wording of our Vienna Declaration of September, 1958, reveals the caution that was felt at that time. Nevertheless, it remains correct insofar as it went and I trust that we will not hesitate to re-affirm that statement in view of its new relevance. Furthermore, we should bring to the attention of the Soviet Government, and to those who may follow its lead in resuming testing in the atmosphere, the heavy responsibility that is theirs when so many lives appear to be at stake with each successive test.



In addition to this direct hazard to life resulting from the resumption of testing we must note another casualty: the breakdown in confidence. In Moscow last year we had widely affirmed how essential it was to create a growing sense of confidence if the major steps in disarmament were to be undertaken. In our Statement at the end of that Conference, we had said "We have also agreed that successful completion of a disarmament plan will require that the present suspicions between nations be gradually reduced and replaced by a growing sense of common interest, mutual understanding and confidence." If we were correct in asserting that the building of trust and confidence was a precondition of substantial disarmament, then we must also conclude that the cause of disarmament has been gravely hurt by the Soviet resumption of testing since it has destroyed the sense of trust and confidence that the moratorium had created. We must, I think, recognize the magnitude of this loss and be ready and willing to contribute, if and when it becomes possible, to the building of a new set of relationships that will provide essential element of mutual confidence.

Having examined the very different paths which the Anglo-American Government and the Soviet Government were following during this year and having noted the contrast between the attempt to reach a test-ban agreement on the one hand and noting further the severe consequences that these tests will have upon the world's population and in creating a crisis in confidence which sets back the time at which disarmament can be usefully discussed, it is necessary to examine the causes which the Soviets themselves claim were responsible for this fateful decision. Insofar as we have heard from Professor Khvostov and learned from the statement of the Soviet Government these seem to be four in number: the failure to reach a test-ban agreement, the testing by France, the claim that the United States was about to begin testing in any event, and the German crisis. The first of these has been dealt with above. Let us examine the other three.

The four atomic tests carried out by the French Government in 1960 and early 1961 have been a source of deep concern to all of those who looked toward a successful conclusion of the Test-Ban Treaty. I regret that the General Assembly vote of censure did not include that of the United States and that the vote, though large, did not deter the French Government. Since France was not a party to the moratorium agreement among the three nuclear powers in 1958, its testing did not violate any agreement. Yet it was chiefly to prevent the spread of nuclear weapons to other countries that the Test-Ban negotiations were begun. Hence, the most expedient way of dealing with the French testing was to proceed to the conclusion of



a Treaty and see if France would then ratify it. If this failed, the basis would then exist for joint efforts supported by a properly mobilized world opinion.

In assessing the real harm which the French tests have done to the prospects for concluding a Treaty one has to ask whether they were proceeding at such a rate that France may become a significant nuclear power before the Treaty could reasonably have come into operation. The answer to this is clearly no. The French tests have been small yield tests and have not included any thermonuclear explosions. Indeed the last test, which occurred more than six months ago, is known to have been less than one kiloton. The smallness of these tests both in size and number simply do not permit the conclusion that France was advancing rapidly in nuclear technology nor that such modest tests were providing any knowledge of use to her allies. Thus there was no basis at the present time for using the French tests of some time ago as a pretext for resuming nuclear tests. While the testing was regrettable in its effect on the international climate, it fell very far short of being a threat to any of the three nuclear powers. Moreover, the slowness of French progress could be taken as the best possible evidence that Britain and the United States were not providing help and thereby violating the spirit of the moratorium.

Let us look next at the claim that the United States was about to begin testing anyway. The simplest test of the credibility of this proposition is that if this were thought to be true, then why did the Soviet Union not wait and allow the United States to take the blame and receive the condemnation for breaking the moratorium. Of course, the matter of how long the moratorium should go on was being openly discussed in the United States as a consequence of the failure of the Soviet Union to show any interest in reaching agreement in Geneva. Statements made in the heat of our political campaign or by the few strong advocates of this course can be quoted. But the difference between advocacy and decision is very great. The fact is that there is no evidence that the United States was on the verge of testing and the action by the Soviet Union in testing shows that this was also their estimate.

Finally, there is the much more complicated issue of the German crisis. The statement by the Soviet Government states that "The Soviet Government has been compelled to take this step . . . under the pressure of the international situation created by the imperialist countries . . . [It] cannot but reckon with the fact that . . . West Germany and the allies of German militarists are feverishly engaged in military preparations." There follows an elaboration of this general point which concludes with reference to the reinforcement of the West Berlin garrison and its interpretation



by the Soviet Government as a provocation. We are told it was the threats and military preparations that seized the United States and some other NATO countries that forced the Soviet Union to break the moratorium.

What is one to make of this? Let me acknowledge at once that it is indeed pretentious for me to discuss such a broad issue so far outside my field of competence. But surely it must be obvious to all that pretexts of such a general nature could be made for any major action either side wished to take. I can, therefore, only discuss some facts which bear upon the general validity of the point. Before doing so, however, I must first state quite clearly that I do recognize that the wounds of World War II have not healed and that the enormous losses suffered by the Soviet Union justify passionate concern with the nation that mounted the attack. It is not enough to say that this experience is past, but it is important that the deeply felt emotions that it generated do not become inflamed for invalid reasons. In this context let us consider first the situation in Berlin where the antagonisms are focused and then the military situation in Germany as a whole. The origin of the situation in Berlin goes back to the end of hostilities in 1945. At that time half of the territory that is now East Germany was occupied by the forces of the western allies. This large territory was given up to Soviet administration in return for the rights of joint occupation of Berlin. Thus the rights of the Western powers in Berlin stem from military conquest plus a redistribution of occupied territory by the victors that was clearly to the Soviet advantage. We are now in the third crisis over rights in Berlin and a German peace treaty. While this particular crisis dates from the meeting of Chairman Khrushchev and President Kennedy in Vienna, it seems to me that the ultimate origin of each of these crises lies in the inability of the East German Government to deal with the unending exodus of its citizens to the West through Berlin. The magnitude of this immigration is important. Accurate records were not kept until September, 1961. Since then, however, until the Wall was built in Berlin last August, 2,634,000 refugees came into West Berlin and West Germany. This means an average of 220,000 persons per year for 12 years.

Now there has been some flow in the opposite direction as well. This has reached as high as 20 per cent but some of these persons returned again. So roughly one can take 200,000 as the annual loss of people from East Germany and these were predominantly from the skilled and educated classes. To understand this number, one can note that proportionate losses from the Soviet Union or the United States would be 2.5 million people annually. This makes it evident that losses at such a rate, particularly when they are biased in favor of the more productive members of the



population, simply cannot be sustained indefinitely. Yet this had been occurring in East Germany for 16 years following hard upon its own wartime losses. Thus if the East German economy was to be stabilized, this drain had to be stopped. With other incentives of no avail the Wall was built. While one must regret the methods employed to stop this tide of people wishing to immigrate to the West, it is possible that the most vexing problem in Germany has been remedied and as a result the source of greatest friction, which so often became turned into anger at West Germany and the NATO countries, may have been cut off at its source. Of course, the stopping of immigration may have quite different consequences, but in any event the major cause of Soviet displeasure in Berlin itself appears to have been removed and the difficulties that will arise at this focal point will almost certainly be different than in the past and, let us hope, not so potentially explosive.

The military situation in Germany is, in reality, quite different from the refugee problem, although the latter may have stimulated a distorted view of the former. Therefore, let us look briefly at this question in fact and not in terms of emotional assessments involving alleged West German intentions. In terms of military division, it is well known that there are about 22 divisions in West Germany and 26 in East Germany at the present time, according to a recent account in the New York Times. In West Germany, five of the divisions are United States Forces and seven or eight are West German forces. In East Germany, a country that by population and area is only one-third the size of West Germany, there are 20 Soviet divisions and six East German divisions. Thus, in terms of German armaments, we see that the six East German divisions, relative to a population of 16 million, is much greater than the seven or eight West German divisions based on a population of 62 million. The conclusion is obvious: Three times as many East Germans are armed, in relation to the population, as in West Germany. Moreover, the number of divisions of foreign troops on East German soil is considerably higher than on West German soil and behind the borders of East Germany we see several times more divisions than in all of Western Europe. In view of this situation, it would appear to be well to view the Soviet claims of feverish military preparations and provocations in proper perspective. The seven or eight West German divisions, even if increased by several more, are not nuclear armed. Viewed against the towering nuclear arsenal of the Soviet Union, its means of delivery, and its 20-fold larger Army, the West German Forces can be seen for what they are. One cannot seriously conclude that any thinking Soviet citizen could fear this situation unless he allows his perspective to become monstrously distorted by memories of 20 years ago.

Of course, the danger of war exists, but it is in war among the nuclear powers that the ultimate danger lies. And it is the



responsibility of the nuclear powers to find a means of preventing such a war and of preventing the spread of nuclear weapons which will make such a war more likely. This cause has not been served by the renewal of nuclear testing on pretexts that are seen to be so disproportionate to the harm that has been done in their name. Indeed by reopening the development race in nuclear arms the Soviet Union is in reality encouraging the development of nuclear weapons by all those nations who can afford them.

This is a gloomy assessment indeed. In a small way the tragedy of these last few days is reflected in how different this speech is from the one I had intended to give. I had hoped to speak of constructive things, to suggest ways around our misunderstandings and how we could take up some of the specific problems that would arise at the next disarmament conference. I had hoped to tell you of the new Disarmament Agency which has been designed and which we hope will soon be authorized by our Congress. [This Agency was authorized on September 25, 1961.] But this course seemed to become unreal on September 1 and the path to disarmament that we discussed last December, proceeding from the Nuclear Test Ban Treaty, through perhaps another partial measure such as a Nuclear Material Production Cutoff and then on to a comprehensive treaty, seems remote now. The best that we can do is to learn what really produced this setback and then with resolve look for new ways to our goal. That must be our work in the week ahead.

As we search for new paths and new solutions I think it may be well to look more deeply into history. Without history man is destined to repeat the mistakes of the past. There is one very special way in which this generality seems particularly relevant. It seems to me that one does not have to look very far to see there has been a consistent tendency of other peoples to under-estimate the will of those of us who make up what may be called the Atlantic Community. Look at the last few decades. In 1930 we were faced with a crippling depression which questioned the validity of our economic and social system and reform was thought by many to be impossible. But the system was reformed, and we have mastered the techniques of production and distribution on a scale not previously imagined. In 1939 came the threat from Hitler's Germany. The United Kingdom was the first to hold the line to his blackmail. Again the will of the West was under-estimated. England held fast, and Hitler turned upon the Soviet Union. In 1950 it was thought that the West did not have the will to resist aggression across the artificial boundary that divided Korea. But the will was there. And now in 1961 we face another crisis in which our will is being tested by those who doubt it. In a very profound sense I think this underlies the contriving of the crisis in Berlin and now the sudden outburst of

nuclear testing by the Soviet Union.

No nation has a monopoly on bravery, and in these times, no nation can gain by putting this heroic quality to a test. Nuclear terror will not work. We are locked together, all of us, by the forces of history and the confines of this planet. We will survive together and live in a better world, or we and the civilization that we have built will disappear together. We have climbed together to the rim of the fiery furnace and have looked into the pit that can consume us all. We must retreat together. We must reaffirm the central fact of our lives: the overriding interest that both East and West have in avoiding nuclear war. We must learn to forego the temptation to profit from the terror that its threat can create. Given, as we are, the perception to recognize that the hour is late, we must proceed with an awareness of the responsibility that our knowledge brings us, pick up the broken pieces of our hopes, and begin again the quest for peace.



## ZONES OF LIMITED ARMAMENT IN EUROPE

by

Michael Howard

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General and comprehensive disarmament is the declared aim of all major governments in the world today, irrespective of their ideological beliefs. The repeated statements made by national leaders reflect not only the deep-seated longings of the peoples they represent for a world free, as no world has ever yet been, from the terrible menace of war; but also a conviction that a world-society in which armaments continue to multiply in number and grow in destructiveness is doomed to eventual suicide.

There can be no reason to doubt the sincerity of any statesman, East or West, in his plea for general disarmament. But neither can there be any reason to underestimate the gigantic difficulties in the way of achieving it. The worst of these difficulties are not scientific and technical, considerable as many of the problems are in these fields. They are political. General disarmament involves the abandonment of habits and attitudes which have grown up among the peoples of the world since organized political societies first began some 5000 years ago. Even nations as closely linked by ties of culture, ideology, and common interest as those of Europe were in 1899 or in 1932 found the problems of negotiating disarmament agreements almost insuperable.

Today, these problems are complicated by the great ideological barrier which separates the major states of the world, inflaming mutual suspicions, inhibiting common understanding, and magnifying to a gigantic size the difficulties of communication which exist even among friendly states sharing a common language in a time of profound peace. This barrier must be accepted as a condition of our time which can be removed only by the patient work of generations. And so long as it exists, it will be immensely difficult for statesmen of either side to abandon their responsibility for the safety of their country, either by entrusting it to a supra-national authority which may fall under the control of hostile elements, or by throwing aside their weapons without the certain knowledge that their ideological adversaries had disarmed as well, and were staying disarmed.

Such certainty can be given only by an inspectorate with wide powers and complex organization, and one which may take many years to overcome its initial difficulties and gain the confidence of both sides. Its creation and institution would involve work more laborious and



bargaining more prolonged than that which preceded the setting up of the United Nations; for there was no question of any major state entrusting to the United Nations any powers over its own fundamental rights of self defense. Even when full agreement has been reached over its powers, personnel, budget, and organization, its initial steps are likely to be regarded both by East and by the West, with, at best, cautious scepticism, and at worst, suspicious hostility. It is not difficult to visualize circumstances when its activity or inactivity could do more to inflame international tensions than to appease them; and it is likely to have to survive serious crises of confidence before it is fully accepted and trusted by both sides. All this must be clearly understood and accepted if we are to undertake the task of creating such a mechanism at all.

To say that our task is comparable to that of a group of engineers who, in an age before man had learned to fly at all, had to design, develop, and build an airliner in which all of them were to travel on its first voyage, is in no way to exaggerate our difficulties, and may indeed provide some guidance in how to solve them. Such a group, if it did not want to commit suicide, would be likely to construct models and study their operation under favourable conditions, before building the aircraft itself.

It is in the belief that the construction of such models is an essential preliminary to the creation of any scheme which would work on a larger scale that this paper is submitted to a conference largely concerned with the more general consideration of disarmament; the writer believes that this would be the most useful purpose which a zone of inspected armaments in Central Europe would serve. But this would not be the only purpose. The creation of such a zone--and the further steps which might follow as indicated below--might also help toward a solution of the explosive problem of a divided Germany. But even if progress in achieving general disarmament remains slow, and even if the German question continues to appear insoluble, a limited scheme of inspection in central Europe, reducing mutual fears of surprise attack, eliminating the danger from accidental clashes, providing the opportunity of testing inspection techniques on a small scale, and training nationals of both sides to work together in joint teams would in itself be an achievement, an important stage in a long voyage which might enable us to see more clearly how the next stage can best be tackled.

Many proposals have been put forward, by both sides, for plans of inspection and control in central Europe during the past ten years. They can be very roughly classified under four headings. First there are plans for inspection of all armed forces within an equal distance, on both sides, of the present border of East and West Germany; plans which would not necessarily involve any re-deployment or limitation of forces within the area. The area



concerned has sometimes been defined as covering mainly German territory, between six and 16 degrees east longitude, and sometimes to include other NATO and Warsaw Pact territory, as did the Soviet proposals of April 30, 1957 (0 to 25 degrees east) and the Western proposals of August 29, 1957 (10 degrees west to 60 degrees east). The methods of inspection proposed have included over-flying with aerial photography; ground teams ranging freely throughout the area or established/principal airfields, road junctions, railway stations and ports; and radar facilities interchanged, the East to be provided with radar stations on the Western border of the inspection zone, and the West with similar facilities on the Eastern border. The object would be to provide each side with the fullest information about the strength and deployment of forces beyond the military frontier--though not necessarily about details of their armament and equipment--so that each could be reassured that no local surprise attack was being contemplated.

The second category of plan would add, to inspection, a limitation of the size of the forces to be held within the inspected zone, but without drawing any distinction as to the type of their armament--whether nuclear or conventional--or their country of origin.

The third category includes all plans, such as that brought forward by Mr. Adam Rapacki in the autumn of 1957, for the creation of a nuclear-free zone; that is a limitation not on the size of the forces within the zone but on their nature. Aircraft equipped with nuclear bombs, nuclear artillery and nuclear missiles of every kind, would be prohibited. Control would extend not only to the storing and deployment of such weapons, but to their manufacture within the inspected area; which, in Mr. Rapacki's proposal, comprised the Federal German Republic, the German Democratic Republic, Poland, and Czechoslovakia.

Finally, there are the various proposals which have been put forward by both sides for some form of political disengagement in central Europe, whereby all foreign troops, with or without nuclear arms, would be withdrawn, either from Germany alone, or from the surrounding territories as well, and their place would be taken by national forces of limited size, possessing no nuclear weapons and subject to international inspection.

It is not the purpose of this paper to expound any of these proposals at length--some 172, according to one authority, have been put forward--or to discuss the reasons why none of them have ever found sufficient favor with both sides to become the subject of serious negotiation. What can be done is to set these plans in some sort of relation to one another and see to what extent they offer some hope of further progress toward mutually acceptable arrangements in



Europe, even if progress in no other area can be made. But in passing, it must be said that these proposals--especially those under the third and fourth categories--have been rejected by one side or the other as much for political reasons as for military. Both the political and the military climate may alter, and measures unthinkable five years ago may, as relations between allies develop or political programs change, become perfectly feasible for us today. But such developments may also be unfavorable to certain proposals, and further developments may occur--changes of regime, unexpected economic changes, technical breakthroughs in the military field--which interfere with or wreck the implementation of proposals even after they have been mutually and sincerely agreed. In formulating policy we must always take this into consideration, realize that any timetable or program which we may lay down is likely to be entirely disorganized; and not be too worried if it is.

The four categories set out above are not mutually exclusive. They could indeed be regarded as successive stages in the implementation of a final plan, were it not that few of the official supporters in the West for the first or second categories are at present prepared to consider the third, much less the fourth, as either practical or desirable steps. To enter into an agreement for mutual inspection in the belief that this was the first step toward disengagement or a de-nuclearized zone, would be to court disappointment and risk complete breakdown of negotiations. The protagonists of disengagement, like those of general disarmament, would have to recognize, first, that the establishment of such mutual inspection was a desirable object in itself, even if no further measures were immediately possible; and secondly, that such a measure would not only not stand in the way of further steps toward their objective, but would be of considerable help toward it.

On the other hand, those who can see no objections to a limited measure of mutual inspection would need to be firmly discouraged from refusing to undertake it for fear that it would be either "the thin end of the wedge," or alternatively, because of its harmlessness, not be worth undertaking at all. The first attitude argues an unnecessary lack of confidence in their ability to argue their case, while the second would prevent us from entering into any form of agreement whatsoever. If, because of our ideological conflict, we can reach agreement only on "harmless" matters, let us at least register that agreement, even if we are under no illusions about the extent of its significance.

In the autumn of 1958, at the Conference of Experts on Surprise Attack, the Soviet delegation put forward fairly detailed proposals for a system of mutual inspection by ground control posts and air photography. They proposed a total of 28 control posts in



the countries of the Warsaw Pact, including six in the Soviet Union, and 54 in the countries of NATO and the Baghdad Pact countries, including six in the United States. Each of the posts, which would be sited on main roads, in ports, and at railway junctions, would be manned by staff drawn half from the "host" country and half from the "guest country, while the host country would provide the commander of the post and all ancillary staff. Aerial inspection, which was to be carried on within an area of up to 200 kilometers on either side of the front line, was to be conducted by aircraft of the "host" country, though control officers from the "guest" side would be present on all flights. Each side was to process, interpret, and report on its own photographs; and each side could maintain a veto over sending photographs of its own area to the other side.

The response of the West to these proposals was extremely cool, for three reasons. First, the Western delegation to the conference had come prepared to discuss, not specific proposals of this kind, but the scientific problems of detection of surprise attack, which they interpreted in strategic and intercontinental rather than in European terms. Second, the USSR proposals for inspection were firmly linked with proposals for limitation of forces and the withdrawal of nuclear weapons, which the West at that stage was not prepared to consider. And third, the inspection mechanism outlined by the USSR seemed to the West to offer very inadequate guarantees of effective performance.

The plan was, said Mr. William B. Foster, leader of the United States delegation, "in effect, self-inspection. It would afford no indication--or at best only the most unreliable indication--of the imminence of surprise attack." From each of these reasons for the West's refusal to accept the proposals, we can learn a useful lesson for the future. The first reveals the degree of mutual misunderstanding which is still possible even over strictly procedural matters; and which makes it desirable to keep all agreements and negotiations as simple and straightforward as we possibly can. The second shows the unwisdom of linking together the various categories of inspection and control schemes. In asking too much one may get nothing at all. We are likely to move much further if we go more slowly and consolidate each stage before choosing our moment to move on to the next. And third, if the constitution and powers of the inspectorate is a controversial issue in so limited a field as this, it is not to be wondered at if it creates formidable difficulties when we come to the problem of inspection of general and comprehensive disarmament. The case for a pilot scheme where the difficulties can be threshed out and a workable formula discovered appears all the stronger.

In spite of their failure to take up the Soviet proposals, for the reasons listed above, the West remains very willing to pursue the possibility of creating a zone of mutual inspection, as the



repeated statements of our leaders have shown, and N. S. Khrushchev, in his speech of July 8, 1961, showed an encouraging willingness to reciprocate. The mutual fears in this area, that each side was preparing to launch a surprise attack on the other, have abated considerably in recent years; but one can never have too much in the way of assurances. Were either side to be insane enough to contemplate anything of the sort, the attack could not be launched solely with the forces held in central Europe. Command of the air would be needed if such an attack were to have any hope of success, and that command would have to be secured by destroying the defender's tactical air power by air and missile attacks which would be launched by strike forces located deep in the rear of the attacker's forward positions, and probably well beyond any inspection zone. But overlapping radar-screens would give additional warning of such an air strike; and the ground attack which it heralded would be preceded by extensive preparations which could hardly escape the eyes of local inspection teams. Indeed, one of the most useful functions of such inspectors would be to provide information that apparently menacing maneuvers did not in fact presage a hostile movement, but were carried out for purely internal reasons. The fact that such information is normally provided anyhow by the military intelligence of both sides is no argument against formalizing and making easier the interchange of information in the interests of greater confidence and relaxation of tension.

As to the constitution of the inspectorate, it would be premature to discuss here what could only be settled by detailed negotiation. The Soviet suggestion that the commander and ancillary personnel should be found from the host country has the drawback that it would delay and make obstruction easier if the host country, for any reason, wishes to hamper the working of the inspectorate; on the other hand, it would have the advantage of making easier operations in an area whose nationals and officials might anyhow regard the operations of the inspectorate with a certain lack of enthusiasm. It would in any case be for the officials of the guest country to enumerate the areas and activities which they wanted to inspect; and if they reported obstruction, either from their colleagues or from nationals in the inspected zone, their governments would draw their own conclusions. But the possibility of joint, alternating, or neutral command systems should also be explored, and the powers should be prepared to experiment with all of them, changing and adjusting as was found necessary.

The same arrangement would apply to the procedure for aerial photography. The West would undoubtedly prefer a joint central developing and interpretation center, where a complete picture of the entire inspected zone could be built up and kept under review; but the Soviet proposals for a dual system might be made acceptable if the rights of control officers from the guest country were sufficiently defined and if access to all photographic material for both



sides were adequately guaranteed. It would not be desirable or necessary for the contracting powers to commit themselves in advance and irrevocably to any specific scheme. Whatever was agreed should be on an experimental basis, subject to review and, if necessary, revision at the end of a trial period.

The area and degree of inspection would also need to be negotiated and adjusted, rather than laid down in a formal and unalterable blue print. Where there is disagreement about the size of the zone to be inspected, it would be as well to accept the smaller of the proposed areas, so long as the balance was kept and without prejudice to a possible extension later if conditions were favorable and both sides could be brought to agree. In order to avoid offending the susceptibilities of nations whose territory would be subject to inspection, the boundaries of the inspected zone should not coincide with national frontiers, but run either along lines of longitude and latitude or along such easily recognizable geographic features as rivers and coasts.

As for intensity of inspection, one might accept, as a working model, the kind of access accorded by armed forces to the military attaches of friendly powers; that is, freedom to view the general appearance and performance of aircraft, vehicles, ships, and weapons in general military use with necessarily being accorded the right to conduct a detailed examination. They might be accorded access to the records of all training camps, barracks, airbases, and military check-points at railway stations and ports within the inspected zone; and they might be given special powers of inspection of fuel dumps and pipelines. Finally, liaison officers from the guest country might be attached to all major headquarters within the inspected zone, with right of access to information on a strictly reciprocal basis.

Such suggestions can be multiplied indefinitely, and valid objections may be found to all of them. But if agreement can be found on minimal measure, that agreement should be acted upon. And it must again be stressed, that no measures of this sort can give absolute assurance against surprise attack, launched by long range weapons from outside the inspected zone. Such total security would be almost impossible to achieve, even by the most ingenious and omnipotent of inspectorates. But it would make a surprise attack considerably more difficult, by increasing enormously the risk of detection and delation. Such an attack, if launched by either side, would no longer be a local and limited operation which the attacker might reasonably hope to restrict to precise objectives, but a strategic operation, automatically invoking strategic retaliation and spiraling up rapidly to full nuclear war.



With the inspectorate established, the powers concerned could consider the establishment within the inspected area of agreed force levels. In principle, this might not prove difficult. Neither side is happy about maintaining armies of their present size in central Europe, with all the expense and dislocation that this involves. Each side does so because it believes that the other is liable to launch an attack; and if that belief could be weakened by an objectively operating inspectorate, the incentive for maintenance of forces at their present levels could be correspondingly reduced.

Such reductions could be phased by agreement or they might be unilaterally carried out; but this is something that cannot be profitably discussed without reference to the political situation. At the moment of writing (August, 1961), such an agreement is out of the question, except as part of a more general settlement of Germany; and even under the most favorable of political conditions, the grave difficulty would still remain which has so far wrecked all proposals for disengagement: The Soviet Union is connected by a land bridge to Western Europe whereas the United States is not. The USSR can, thanks to her geographical situation, reinforce her armies in Eastern Europe with an ease denied to Britain and the United States; and a re-deployment of any forces that she were to withdraw from Germany and Poland would present few of the difficulties which would confront British and American commanders, compelled either to resite their divisions in the populous territories west of the Rhine or return them to their homelands for which they could not easily be recalled.

This asymmetry of forces is not the fault of the Soviet Union, but it must be recognized by them as an exceedingly awkward factor, complicating any attempt to reach a balance of forces in Europe. The growth of air transportability will mitigate but is unlikely to solve the problem; and at present it appears that the only way in which the West could respond to a massing of conventional forces by the USSR either within or outside the controlled zone, would be by bringing to a greater state of readiness her land, sea and air-based nuclear forces. In view of this, it is perhaps premature to discuss now, in any detail, the proposals for limitation of forces. In the event of progress with general disarmament, however, this problem would be very greatly eased.

Thirdly, we come to the proposals for a denuclearized zone in central Europe, one where, in the words used by M. Gromyko at the United Nations in March, 1956, "the stationing of military formations provided with atomic and hydrogen weapons of all kinds shall be prohibited," and which might, if M. Rapacki's proposals were adopted, include not only East and West Germany but Poland and Czechoslovakia as well. The raising of this proposal and the West's reaction to it, show the problems of mutual mistrust which divide the powers in Central Europe. The Soviet Union and its East



European allies dread the revival of a nuclear armed and revanchist Germany which may attack eastwards as she did in 1941, to reclaim her lost lands. The Western powers fear a massive assault by Soviet land forces which could overrun Western Europe before the United States could make up its mind to nuclear retaliation.

Each side may consider the fears of the other absurd. The armed forces of West Germany are so closely integrated with those of her allies that it would be technically impossible for them to launch an independent attack, even if such a policy were to recommend itself to that prosperous and pacific people, who have their own recollections of the horrors of war. Our Soviet colleagues can no doubt equally assure us how unthinkable it would be for their forces to fight any but a purely defensive battle against the West. Still, however groundless they may be, these fears must be treated as political realities. The West must understand the Soviet alarm at seeing nuclear weapons in German hands, even with all the safeguards imposed on their use, and the USSR must understand the feeling of helplessness with which the small NATO forces, deprived of nuclear weapons, would confront the massive armies which the Soviet Union could bring to bear against them. It was this motive which led the Assembly of Western European Union in April 1958 to recommend the rejection of the Rapacki plan as "a Soviet trap."

So strong are Western feelings at present that there is little prospect of any immediate change in the attitude of official circles to the Rapacki proposals. Apart from the weakness of the conventional forces which would remain--a weakness which could be and is being remedied--there are fears that any such redeployment of forces or redistribution of weapons would create considerable political strains within an alliance, all of whose members are theoretically equal. Difficulties are foreseen about siting the forces withdrawn from the denuclearized zone; and it is sometimes suggested that anything which can weaken the probability of an immediate nuclear response to any Soviet attack would only make such an attack more probable.

It is easy to contest these arguments. Division of labour within armed forces and even within alliances is a rational arrangement, and no question of status need attach to those units which have nuclear weapons and those which have not. The size of the nuclear armed units at present in Germany--missile units and atomic artillery--is not such as to present any major problems in the way of resiting them. Moreover, even if such units were withdrawn, an effective nuclear response could be mounted against any attack, by aircraft or medium-range missiles, sited outside the denuclearized zone. Such a response would at first be in the nature of interception against the attacker's supply lines and bases, rather than close



battlefield support; but so overwhelming would it be that its deterrent value need be no less than that of close support weapons. It is highly unlikely that the Soviet high command would consider it worth over-running West Germany if the price was the nuclear devastation of East Germany, Poland and Western Russia; nor would West Germany or her allies be likely to invade Eastern Europe in the sure knowledge that her homeland would be laid waste.

The argument that any weakening of the probability of immediate nuclear response involves a weakening of the deterrent cuts both ways. If the probability of immediate nuclear response is maximized by placing control of nuclear weapons in the hands of the local commanders, so also is the danger of accidental and unnecessary nuclear war through miscalculation. But the decision, as to which of these two risks is the greater, will depend on the political climate, and it must be recognized that in the existing state of East and West relations even the officials most enthusiastic about the possibilities of mutual inspection refuse to consider a denuclearized zone as being within the realm of practical policy.

The same can be said a fortiori about "disengagement": plans for an area in central Europe from which not only nuclear forces but all foreign troops would be removed, leaving national forces, without nuclear weapons, at an agreed level and subject to international inspection. The most recent proposals of this kind have been put forward by the German Social Democrat Deputy Herr Helmuth Schmidt, who suggested also that Soviet, American, British and French token forces would remain along the existing East-West German frontier as a guarantee of the interest of those powers in the defense of their German allies; and that such forces should also, of course, remain in Berlin. In the event of aggression, the allies of the party attacked could still intervene with aircraft and missiles based outside the disengaged zone, and the balance of forces would not necessarily be disturbed. In favour of such plans, it can be said that without some such agreement it is difficult to believe that the reunification of Germany will ever be possible. Against them, it must be admitted that in the existing state of world tensions they are purely academic. A withdrawal of the forces of Germany's Western allies from the line of the iron curtain is at present conceivable only as part of a far more general political settlement, of which there is no immediate prospect. Not only have all Western governments set their faces against disengagement as a dangerous weakening of their defensive posture, but even the opposition party in Germany has rejected it as an issue on which to appeal for popular support. So long as the West, rightly or wrongly, believes that an attack on Western Europe is a possible course of action for the Soviet Union they will continue to believe that there can be no substitute for all the allies standing together to meet it. And no doubt the feelings of the USSR and her allies are identical with regard to a possible attack by the West.



Such attitudes may soften. If negotiations over general disarmament are successful, they certainly will. But meanwhile they must be accepted and lived with, and we must be tolerant of one another's fears. It is because those fears, however baseless, are still so intense that the present writer believes that they can only gradually be dispelled by a series of limited agreement, each experimental and subject to adjustment, but all accumulating to establish the necessary basis of confidence which will make easier those general agreements on disarmaments which will in their turn, enable us to make further progress along the lines sketched above. There is no reason to expect such progress to be rapid, but there is equally no reason not to begin now.

## REVIEW OF THE DISARMAMENT SITUATION AFTER THE SIXTH PUGWASH CONFERENCE

V. M. Khvostov

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In the course of our past conference in Moscow, a thorough discussion was carried out of the disarmament problems which helped each one of us to clarify the difference between the views held by the participants of our movement. As the result of the interesting and meaningful discussion, we emphasized the importance of the resolution, adopted in 1959 by the 14th session of the U. N. General Assembly, pertaining to general and complete disarmament.

As that time many of us cherished hopes for rapid progress in the cause of disarmament. In particular, the opinion was widely held that the new American Administration would present a new approach to the disarmament problem. The view was prevalent among the Soviet people and particularly among the Soviet intellectuals, that the election of President Kennedy would make possible the achievement of an agreement on disarmament.

What has happened since that time? I shall attempt to outline the development of the disarmament problem as it appears to me.

Our Moscow conference coincided with the 15th session of the General Assembly of the U. N., to which the Soviet Union offered for consideration a draft of "Basic Theses for a Treaty on Universal and Complete Disarmament." In this draft, many propositions and desires of the Western powers were taken into account. Nevertheless, the Soviet draft did not receive any support from the Western powers and was not accepted by the General Assembly.

However, in the course of the Assembly discussion, the socialist countries and a number of states in Asia, Africa, and Latin America reached a considerable degree of mutual understanding. A large number of states agreed on the necessity to develop and conclude a treaty of universal and complete disarmament. This is witnessed by the fact that during the course of the debate in November, 1960, a draft of a resolution sponsored by 12 neutral countries, was offered for the consideration of the 15th session. These countries included Burma, Venezuela, Ghana, India, Indonesia, Iraq, Cambodia, Morocco, Nepal, United Arab Republic, Ceylon, and Yugoslavia. It listed a minimum of points required to provide a basis for a treaty of universal and complete disarmament. The resolution stressed the necessity of concluding this treaty as soon as possible.



The Soviet Union supported the proposition of the neutral countries. Much to our regret, the Western powers regarded the draft of the resolution of the 12 countries as unacceptable. This was responsible for the failure to reach agreement on the basis of the resolution supported by the socialist states as well as the majority of the neutral countries. The agreement which appeared possible to the Soviet Union and to the other socialist states, and which was the purpose of the resolution of the 12 countries, could not be readied because the Western powers deemed it impossible to accept the position of this resolution. This fact had far-reaching consequences.

A new effort was undertaken by the Soviet Union in order to move the negotiations out of the impasse. As is well known, the inspection problem has been quoted for a long time as the principal obstacle in the path to disarmament. In this connection, the head of the Soviet Government, N. S. Khrushchev, publicly confirmed that the Soviet Union is ready to accept any offer of the Western powers pertaining to the international inspection of disarmament, if only they would agree to universal and complete disarmament. However, this declaration of the Soviet Government did not lead to any positive reaction of the Western powers. We did not even receive any concrete, detailed proposition pertaining to the exact desires of the West in inspection. The Soviet plan offered detailed propositions pertaining to the organization of inspection at the 14th session and in still greater detail at the 15th session of the General Assembly. However, no concrete outlines were received by us from our Western partners. These documents have been published and for this reason I shall not discuss them here.

How can one explain the lack of response? We explain it as follows: If drafts of this kind had been offered, the Soviet Union would have accepted them and the necessity would have arisen for the Western powers to make a declaration for or against universal and complete disarmament. This evidently is not desired, however. Disarmament is not wanted. Naturally one does not want any public detection of this lack of desire to disarm. I would like to remind my colleagues that, in the welcoming address to the 6th Pugwash Conference, N. S. Khrushchev pointed out that the Soviet Union is ready to begin immediately complete and universal disarmament, if the Western powers are ready.

When the work of the 15th session of the General Assembly was resumed in March, 1961, the Soviet Union moved to continue and complete the discussion on disarmament problems in order to reach an agreement, at that very session, about a common basis for negotiation of a treaty for universal and total disarmament. But this was met with a wish of the new American Administration.



to postpone temporarily the discussion in view of its lack of preparation at that moment for such negotiations. The Soviet Government met this desire halfway. In connection with this request, it considered it possible to omit from the discussion during the 2nd part of the 15th session of the General Assembly, the problem of disarmament, and to carry out in June-July, 1961, Soviet-American negotiations on the disarmament problem.

The General Assembly of the United Nations unanimously resolved to take note of this Soviet-American agreement and decided to discuss the disarmament problem at its 16th session.

Before the Soviet-American negotiations were started, the work of the Geneva Conference on the cessation of tests of nuclear armaments was resumed. This was in March, 1961. In our country people who follow politics expected that the new American Government would manifest serious initiative in these negotiations. Did the analysis of the preceding course of these drawn-out negotiations offer much promise? This analysis revealed a Western desire to exclude from the proposed test ban treaty a definite category of tests, namely underground explosions. In other words, an analysis of the history of the negotiations leads to the conclusion that our partners desire to preserve the opportunity for perfecting nuclear weapons--or at least certain types of weapons. A direct declaration was made on their behalf that upon termination of the moratorium period, which they wished to make too short, they would automatically acquire the right to renew underground testing.

The Soviet Government, this fact notwithstanding, continued the test ban negotiations, but the above observation made the public opinion in my country rather cautious. What did the American propositions, made on March 21, 1961, show?

The United States accepted the Soviet proposal on the manner of inspection of explosions carried out for research purposes, recognized the principle of parity of the socialist and the Western powers in the control commission, and assigning personnel to the inspection posts. However, these are not the principal problems; and furthermore, these are problems in which the old position of the United States was so manifestly unfair that it was very difficult to defend it. I refer in particular to the problem of parity.

The significance of these changes in the position of the United States was substantially diminished by the American refusal to state formally the understanding on all those points on which an agreement has been reached. Thus, the new round of negotiations on cessation of tests resulted in much disappointment to the Soviet Union, especially because earlier the Soviet Union had met the



Western powers halfway in many problems.

The Soviet Government was forced to apply to the cessation of tests the conclusions it has reached from the activity of the Secretary-General of the U.N. His activity in the Congo in particular have evidence which clearly supported the conclusion that had suggested itself for a long time, that the structure of the General Secretariat had become obsolete and no longer satisfied the requirements. As early as the 15th session of the General Assembly, the Soviet Government offered a reform of the Secretariat. The conclusions drawn from the sad experience with the activity of a single administrator in the system of the U.N. unavoidably had to be applied also to the drafts of inspection plans envisaged in negotiations on atomic tests. The Soviet Government stated that it was impossible to entrust to a single administrator the administrative authority in the inspection system, supervising the cessation of nuclear tests. The Soviet Union proposed that an Administrative Council be organized, consisting of three persons each of whom would represent one of the three groups of states existing at the present time. This proposal was declined by our Western partners, and interpreted by them as an attempt of the USSR to bring into the administration of the inspection system the right of veto.

I must acknowledge that public opinion in the Soviet Union, and I am far from excluding myself from it, cannot understand why the refusal of a single administrator to accept a decision or action does not constitute a veto, while a similar refusal of one of the three administrators would allegedly constitute a veto. We understand the position of the West in this problem as follows: It is assumed that in the present situation in the U.N., a single administrator, even if selected from the states that are not parties to any military pacts, will in all probability be an actual supporter of the Western orientation, similar to the first Secretary-General, Trygve Lie, or to Hammarskjöld, even though both of them came from neutral countries. While reproaching the USSR for an attempt to create a veto opportunity by the three-man organ, the West does not wish to lose its single administrative veto which it has in fact at its disposal in the Secretariat of the U.N. It is perfectly clear that a single administrator may decline just as many measures as a participant of a three-person Administrative Council. However, the opponents of the Soviet proposition do not term it "veto" when the "no" is pronounced by a single administrator, but a similar "no" of a member of a three-person administration is declared to be a veto. In my opinion this is illogical.

Furthermore, the fact is disregarded that a council by our opponents consisting of three members representing different



political interests would of course show less bias and more discretion in its decisions than a single administrator, who has considerably less constraint in his arbitrary decisions. Consider also the fact that the U.S. and England wish to endow the administrator with wide rights: for example, in appointing the personnel of the inspection posts.

Also the fact is not considered that the activity of the administrative organ is limited, either to the execution of the decisions of the control commission, or to actions of a nature strictly determined by an international treaty. As is well known, the inspection quotas will be defined by treaty and this precludes the necessity of voting, or reaching agreements, on problems of inspection of unidentified phenomena. Within the limits of the quota agreed upon, the inspection quotas are to be determined by the request of an interested party, on the only condition that they be based on readings of proper equipment at the inspection posts.

I said that there was no logic in preferring a negative decision always possible in the case of a single person, to a negative decision of three persons. However, while there is no logic in it, there is politics in it. The Western powers hope that they will be able to bring about the appointment of their own man as the single administrator, and thus the administration will be in their hands, similar to the General Secretariat of the U.N. In the case of a three-member organ this is, of course, impossible. This is the true reason for the discord that arose over this point.

As to the Soviet public opinion, we shall never agree to the administration of the control system being vested in people who serve the military bloc of our opponents. We wish to be insured from such a situation arising as a result of the bias of a single administrator joining the Western camp following in the footsteps of Mr. Hammarskjöld. We think that a three-member council will guard us from the prevalence of the West in the inspection system of the kind we have now in the Secretariat of the U.N.

The Geneva negotiations may be summed up as follows: The new American Government did not demonstrate far-reaching initiative. The position of the U.S. and England with respect to the expert opinion of scientists concerning the moratorium on underground explosions and certain other problems pointed, as before, to the intention to preserve the opportunity to carry out certain types of nuclear tests, in which they are interested. The stubborn reluctance to include representatives of the three groups of states in the administration of the inspection system, leads to a conviction that there is a desire to create an inspection organization obedient to the will of the West. All this is far from generating in us, Soviet scientists, any bright hope.



Of a special significance are the tests carried out by France. Inasmuch as it is a part of the Western military group and is a member of NATO, it is evident that the advantages gained from French testing may, under certain conditions, easily serve the entire North Atlantic bloc. The possibility is indeed not precluded that France may begin to test equipment, which may serve to perfect Western armaments. This fact places the USSR into conditions of intolerable inequality. For a long time, the Soviet Union has refrained from tests while the Western bloc has members who carry out public explosions. Under these conditions, the question must be asked, not why the USSR has announced the resumption of nuclear tests, but rather why it did not do it earlier. The declaration of the Soviet Government published on August 31 asked a well-founded question: How would the U.S. react if nuclear tests would have been undertaken by an ally of the USSR, e. g., Czechoslovakia? Or--I wish to add my own--China?

Owing to the unsatisfactory state of the Geneva negotiations, the Soviet Government deemed it necessary once more to declare its position with respect to the basic problems of the Geneva negotiations, which remain unsolved. This was done in the form of the memorandum, presented by N. S. Khrushchev to the President of the United States John F. Kennedy when they met in Vienna. Considering the situation created in Geneva, the Soviet Government proposed that both problems, namely that of universal and total disarmament and that of the cessation of tests of nuclear weapons, be solved as one interconnected problem.

The solution of these two problems as interconnected ones would offer an opportunity to overcome the existing discords, and, above all, the principal objection of the U.S. and England against the proposal to institute a three-member administrative organization, the extent of inspection, etc. In its memorandum the Government of the USSR again confirmed its readiness to accept, without reservations, any proposal of the Western states pertaining to inspection on the condition that they will accept this Soviet proposal of the universal and total disarmament. The Soviet Union agreed to sign, in the latter case, a document in which the proposals of the Western powers concerning the cessation of nuclear tests would be included.

Nevertheless, no steps were undertaken by them toward disarmament. On the contrary, measures were taken to increase the arms race.

Last summer, President Kennedy proclaimed a "new course," which provided for a very extensive increase of the military budget of the U.S., for an accelerated program of building rockets and



nuclear arms, for an increase in the armed forces, etc. Measures in the arms race taken in some other countries of the West, above all in the Federal Republic of Germany, are also known. We heard and we continue to hear threats to begin a war against us, as reaction to the conclusion of a peace treaty with the German Democratic Republic.

It is clear that the Soviet Union cannot view the enhancement of the preparation for a war against it, without reacting to it. The Soviet Government was forced to interrupt temporarily the reduction of the Soviet armed forces, which had been planned for this year and to increase the budgetary allotment for the needs of defense. It has become impossible to continue paying no attention to nuclear tests carried out by a member of the Western military bloc, France, to which we have been actually closing our eyes for a long time.

In connection with the intention of the Soviet Government to regulate finally its relations with Germany in a peaceful manner by concluding a peace treaty, the Soviet people have heard threats that in this case a war may be started against it. Very recently, on September 6, one of the most serious, well-known and authoritative American commentators, James Reston, expressed in the New York Times apprehension lest the USSR may be led to think that the U.S. will not be resolute enough to begin a nuclear war against the USSR. Mr. Reston tried to prove, by all kinds of arguments, that the U.S. may begin a war of this kind because of Berlin. He thought that at the present time "the principal danger" consists in the doubt, supposedly existing in the Soviet Union, that the President of the U.S. will be prepared to start a nuclear war.

The anxiety of Mr. Reston (and he is not alone) is unfounded. We in the Soviet Union reckon very definitely with the fact that there are influential people in the U.S. who are ready to begin a nuclear war against us.

It is precisely because we take this into consideration that we consider it necessary to be prepared for such a war; and it is precisely because of this that the Soviet Union found itself compelled to resume nuclear tests. We do recognize the danger of war. The other supposed danger does not exist--the danger that worried Reston--that Soviet people do not believe in the possibility that a war may be waged against the USSR. There is no need for anxiety on that account. But one should not wonder also that the USSR, considering the possibility that war may be started against it, has resumed tests of nuclear arms. You yourself work indefatigably to convince us that there is a danger that the USSR will be attacked, if the conditions of the peace treaty will not be to your liking.



However, I shall not conceal my conviction that prudence will prevail, and the West will not want to go to war over the problem with whom they would have to deal in solving border problems, whether it be a Soviet officer or one of the German Democratic Republic. But the fact remains that we are threatened with war and are thus obliged to prepare for it. The Soviet Union will never start a war. The Soviet public opinion, including scientists, expected much from the Soviet-American disarmament negotiations, which took place in June-July, first in Washington, then in Moscow. But they were interrupted without essential results. Now these negotiations have been resumed. Let us hope that these negotiations, and others that may be undertaken in the future, may be crowned with success.

Speaking of the USSR, the disarmament problem at the present moment can be described as follows:

The Soviet Union has advanced a concrete program of universal and total disarmament which provides for doing away entirely with all armed forces and with armaments of all kinds. According to the proposals of the Soviet Union, the states will have, after achieving universal and total disarmament, no soldiers, no arms. Consequently, the threat of war will be eliminated, completely and forever.

The Soviet Union is striving to conclude as soon as possible a comprehensive, all-embracing treaty of disarmament. The Soviet Government proceeds on the basis of the view that a program of universal and total disarmament can be realized in about four years.

The Soviet Union proposes a strict and effective international inspection system over the execution of all disarmament measures from the very start. The extent of the inspection should correspond to the extent and the character of the disarmament measures carried out at each stage. The Soviet proposals provide for specific inspection measures of all disarmament operations, at each of the three stages of its program of universal and total disarmament. I tell you that up to the present time no country has presented proposals of international control developed in such detail as those put forward by the Soviet Union. The USSR is interested in inspection more than any other participant in the disarmament negotiations, because the lessons of history have forced it not to rely on verbal assertions.

It is the view of the Soviet Government that, after an agreement on universal and total disarmament will have been reached, there will remain no cause for argument on inspection problems. But the establishment of an inspection system over armaments, without disarmament, is not acceptable to us. This would not strengthen the peace. On the contrary, it could make it easier

for an aggressor to carry out plans dangerous to peace. We approve of any measures which would aim at universal and complete disarmament.

According to Soviet proposals a strict international inspection should be established on the spot, checking the destruction of military rockets, military airplanes, surface and submarine naval craft, artillery systems, as well as of all other instruments that can be used as carriers of atomic and hydrogen weapons. The inspection would also be extended to all establishments producing means of delivery of nuclear weapons. Rockets may be fired exclusively for the achievement of peaceful scientific objectives, and this should be accompanied by agreed-upon measures of verification, including inspection of rocket launching sites.

The destruction of means of delivery of nuclear weapons, as proposed by the Soviet Union, would make it virtually impossible for one country to attack any other country with atomic and hydrogen weapons; and this would be achieved already at the first stage of the program of universal and complete disarmament.

The Soviet Government proposes that, simultaneously with the destruction of means of delivery of nuclear weapons, all military bases on foreign soil should be liquidated and foreign military forces removed from the territories of other states. This would ensure equality, from the point of view of security, between the Soviet Union and other socialist on one side and Western powers on the other side, equality being a necessary condition for a realistic program of universal and complete disarmament. The Soviet proposals indicate still other measures designed to make control over disarmament all-embracing.

The Soviet Union still offers this program of universal and complete disarmament, with the strictest inspection, to all other states. It is self-evident that with the controlled destruction of all armament, including of course nuclear arms, all tests of these weapons would cease.

According to the plan proposed by the Soviet Union, the states concerned would take upon themselves an obligation to place at the disposal of the Security Council of the U.N., when necessary, units drawn from the contingents of police (militia) which would remain at the disposal of these states after universal and complete disarmament would have been realized. These units would be equipped only with light firearms. This proposal of the Soviet Union is in strict agreement with the statutes of the organization of the U.N.

The Soviet Union proposes the reorganization of the executive organs of the U.N. based on the principle of equal representation of



the three principal groups of states. The organization of United Nations as an instrument of peace should be brought into agreement with the relationship of forces existing now so as to enhance its strength; furthermore, the reorganization proposed by the Soviet Union is dictated directly by the need to solve the problem of total and complete disarmament. Consider that, if complete and total disarmament would be achieved, then the maintenance of international peace would become the function of international armed forces. With the presently existing, one-sided structure of the executive apparatus of the U.N., when one group of countries headed by the U.S. prevails in it, and rude discrimination is practiced against socialist and neutral states, such international armies would essentially be in the hands of Western powers. How could the Soviet Union and other socialist states entrust the security of their peoples to an international organization in which there is not even a shadow of equality between the three historically formed groups of states? It is obvious that they will not agree to it since they cannot sacrifice the basic interests of their security to please the imperialist states. This argument is valid just as much with respect to the neutral states, who treasure their independence.

In offering a change of the structure of the U.N., the Soviet Union does not strive for any privileges and particularly does not want any dominating position. It demands only equality in the participation in the organs of the U.N. for all three groups of states--the socialist states, the neutral states, and the Western powers.

We have to state that we have assembled here at the moment when the cause of disarmament is not moving forward and everywhere an increase in armaments is in progress. I shall not hide the fact that among my colleagues in Moscow, the conviction is widespread that the West has in general given up the idea of disarmament. My assertions that this judgment should not be generalized did not always meet with understanding.

Whatever the situation, I am convinced that it is the duty of scientists to do all in their power for the cause of disarmament and peace. And the influence of scientists in our time is by no means small and it is rapidly increasing.

The time elapsed since the Pugwash Conference in Moscow was characterized by a rising and increasingly active struggle of wide and diverse social forces in different countries against nuclear weapons and for complete and universal disarmament. The above-described situation in the field of disarmament would have been very incomplete if I had not mentioned this aspect of the situation.



In my country, the public movement for peace and friendship among peoples is exceedingly wide. It could not be otherwise in a socialist country where construction cranes form an integral part of the landscape. The struggle of the Soviet people for peace and security of all nations is indissolubly tied with its daily toil and its enormous creative activity, and, above all, with the carrying out of an enormous program of construction, including dwellings as well as other structures. He who is pre-occupied with the realization of a construction plan on a scale as grandiose as that cannot but strive for peace.

In the Soviet Union, committees for the defense of peace are active in various republics and regions. They are doing quite a job. At the present time, the Soviet public has organized a Peace Fund to support the struggle against war. Several participants of the Pugwash Movement are active in the administration of this fund. Much significance is attributed by the Soviet public to international meetings, including meetings of scientists, directed at the strengthening of the peace.

Let me name several of the meetings that took place, each of which brought a definite benefit. In February, 1961, in Warsaw, a Soviet delegation participated in a meeting of representatives of parliamentary, political and social leaders from 15 European countries, who gathered for an unofficial exchange of opinions on the problems of the West and the East. The participants of this meeting stressed the danger of the threatening atomic war and offered for public discussion a program of disarmament. The international conference in Kiel in March of this year, which concerned itself with economic consequences of disarmament, saw the participation of economists from the Soviet Union. The conference noted that reduction of military expenditures may yield substantial advantages for all countries, without exception. The assembled economists rejected the assertion that the economic well-being of the Western countries is based on the arms race. One should also note other steps of no small importance, such as the conference of leaders of public opinion in the USSR and Great Britain, and the meeting of American and Soviet leaders of similar stature which took place in the Crimea. Both these meetings played a positive role in improving mutual understanding between the peoples of England, the United States, and the USSR.

The Soviet peace promoters participated in the conference on European security which recently took place in Oslo. Soviet scientists contributed to an exchange of opinions between 65 scientists, who also met in the capital of Norway, upon the initiative of Professor Pauling.



Soviet youth demonstrated its initiative in organizing the World Youth Forum which discussed problems of peace and disarmament, among other problems. A wide campaign of popularization of the resolutions of the session of the World Peace Council, which took place in Delhi in spring of this year, was carried out in the USSR.

We wish that scientists would occupy as prominent a place as possible in the vigorous struggle for peace of the various social groups in the different countries.

We, the representatives of Soviet scientists, cordially and friendly greet our respected colleagues from other countries, who carry on the struggle for disarmament and peace among the nations. We hope that the Eighth Pugwash Conference will contribute to making possible the solution of the disarmament problem, for the discussion of which it has gathered here.

# THE PROBLEM OF THE CLANDESTINE NUCLEAR STOCK

Philip Noel-Baker

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## THE PROBLEM OF THE CLANDESTINE NUCLEAR STOCK

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### I. The Possible Size of a Clandestine Nuclear Stock and the Balance of Risks.

Disarmament negotiations have been in virtual deadlock since May, 1955. The reason given has been the danger that a disloyal Government, having agreed to general disarmament, including the abolition of all nuclear weapons, would nevertheless retain a percentage of its past production, and with this clandestine nuclear stock would blackmail or conquer nations which had loyally fulfilled their undertakings.

Dr. J. Robert Oppenheimer warned the UNAEC in 1946 that this danger would arise, unless an agreement for total nuclear disarmament, under adequate inspection and control, could speedily be made.

Sir John Cockcroft and Sir William Penney have now calculated that the proportion of its past production which a disloyal Government could safely conceal from an international inspectorate would not be less than 20 per cent, and might be more.

It is credibly asserted that the U. S. Government's present stocks of nuclear weapons amount to 30,000 megatons, and there is no reason for thinking that the stocks of the Soviet Union are substantially less.

Twenty per cent of 30,000 megatons is 6,000 megatons.<sup>1</sup> In 1959, a Committee of the U. S. House of Representatives made an estimate of the effects of a nuclear attack on the American people. After taking expert evidence, they calculated that if the enemy succeeded in delivering a relatively small quantity of bombs, namely, 1,440 megatons, scores of millions of casualties would result and very great material damage would be done.

If under a Disarmament Treaty, a disloyal Government could in fact secrete 6,000 megatons, and could deliver them against its victim whenever it decided to commit aggression, this would be so

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<sup>1</sup> Dr. Wiesner estimates the possible clandestine stock, which he calls "noise" as 50 to 500 large nuclear weapons "if past production were estimated by known methods of physical inspection."

great a gap in the treaty system that many people would conclude that it was not worthwhile to try to make a Disarmament Treaty at all.

On the other hand, if no Disarmament Treaty is made, the arms race will go on; ever greater sums will be spent on military research and development (\$8,400 million were spent in the U. S. A. in 1960, and no doubt an equal sum in the U. S. S. R.); the existing weapons systems will be still further developed, or replaced by others more potent and more instantaneous in their action; new nations will produce nuclear weapons (e. g., China, Germany--no doubt to be followed by their neighbors); other nations who cannot produce such weapons will be given them by their allies; the destructive power of world armaments will increase by no less in the next 16 years than it has increased in the 16 years since 1945. It is optimistic to hope that this process could continue for another 16 years without leading to a catastrophe, which could be started in panic, by accident, or by a madman's design: It is only 16 years since madmen were in power in Germany, Italy, and Japan.

The Governments, therefore, are faced by a balance of risks. The question to be discussed in this paper is whether there are any practicable measures which will so reduce the danger of the secret nuclear stock that it becomes decisively less than the danger of allowing the arms race to go on.

## II. The Disarmament Treaty

1. General Principles--It is clearly impossible to hope for any such result except as part of the general and complete disarmament which all Governments have declared to be their aim in recent years.

There is general agreement that this objective must be reached in three stages within a specified period of time, under strict inspection and control, and subject to verification at the end of each stage that the obligations of the Treaty have been fulfilled.

It has also been agreed that, at the appropriate stage, an armed military force should be established to prevent aggression, and to uphold observance of the disarmament agreement.

2. Phasing of Armament Reductions--It would confuse the argument of this paper to discuss the phasing of the progressive armament reductions by which the final objective of general and complete disarmament will be reached. It will no doubt require



complex political negotiations; but if the final objective is once firmly accepted, there should be no technical difficulty in agreeing on the reductions and the controls to be set up at each successive stage.

One observation about phasing must, however, be made. During the disarmament negotiations since 1945, many proposals have been put forward and strongly urged by leading Governments; and then, when they have been accepted by other Governments, these proposals have been withdrawn by those who made them.

This has created an atmosphere of great distrust. To make their acceptance of the final objective credible, and to create confidence that they genuinely intend to carry out complete disarmament, it will almost certainly be necessary that the objectives to be reached at the end of the first stage should be more ambitious than those which have been recently proposed.

3. First Stage Objectives--The following suggestions may be made; they are all taken from recent government proposals:

(a) Reduction of manpower (Army, Navy, and Air Force) to one or at most 1.5 million men for U. S. A., U. S. S. R., and China, with proportionately lesser figures for other nations. [Anglo-French Memorandum, 1954]

(b) Corresponding reduction of conventional armaments and equipment. [Ibid.]

(c) A "cut-off" of new production of nuclear weapons and of fissile material for military purposes, with perhaps the closing down of military nuclear plants. [U. S. Proposal, June 27, 1960]

(d) Abolition of the "means of delivery": satellites, missiles, bombing aircraft, aircraft carriers, submarines, atomic cannon, launching ramps, etc. [French Proposal by M. Moch, September, 1959, and March, 15, 1960; "warmly supported" in principle by the British Government; endorsed by Mr. Khrushchev for the first stage in his Memorandum of June 2, 1960]

(e) Reduction of military budgets in accordance with above objectives, and strict budgetary control. [Anglo-French Memorandum, 1954]

(f) Comprehensive and effective inspection and control

by an international organization to be created by the United Nations. [All proposals put forward by all governments since 1955]

All of these first stage objectives are strictly relevant to the problem of the clandestine nuclear stock. But two are especially important: the abolition of the "means of delivery," and the system of inspection and control.

### III The System of Inspection and Control

Inspection and control may be dealt with first, and briefly, because it has been studied in some detail by Dr. Jerome Wiesner; Dr. Bernard Feld; Dr. Seymour Melman and associates; Dr. Jay Orear; and others.

#### 1. Physical Inspection of Military Installations, etc; Industrial Production Inspection; Non-Physical Inspection--

There is agreement that inspection should be of the following kinds:

(a) Physical inspection of military depots, installations, etc., and of all manufacturing and other plants which produce weapons and equipment of every kind. For this purpose there should be: (1) ground inspection, with uninhibited access to everything the inspectors wish to see; (2) permanent inspection of nuclear plants, etc., by resident inspectors, with their own laboratories, and all the rights and facilities which Sir John Cockcroft and Sir William Penney propose; (3) high altitude air photography; (4) low altitude "very high resolution" air photography.

(b) Industrial production inspection: Systematic or random sampling inspection of all plants capable of producing weapons, or weapon components. This would be done by qualified ground inspectors, with the necessary technical knowledge.

(c) Non-physical inspection, sometimes called psychological inspection, or inspection by the people. Dr. Wiesner gives this summary: (1) "Interrogation of key personnel"



concerned with armaments and weapon production; (2) "Public relations campaigns" to convince the citizens of all countries that "clandestine activities are a violation of sacred world agreements"; (3) "Offers of large rewards for disclosure of violations." Professor Orear has suggested that the following provisions should be included in the Disarmament Treaty: (4) The international inspectorate should be given the right to interrogate any citizen about possible or suspected violations of the Treaty; (5) A legal duty should be laid on every citizen to answer such interrogations, subject to punishment for refusal or false statements; (6) A legal duty should be laid on every citizen to report violations by his own Government; (7) Rewards and sanctuary abroad for those who report violations to the inspectorate; (8) Governments should be obliged to give the fullest publicity to these provisions, and their fullest support through their national mass-media.

Mr. Khrushchev has given his support to these proposals for psychological inspection, including the use of Soviet mass-media to make known to the Soviet people the obligation on each citizen to report violations of the Treaty.

2. Budgetary Limitation and Control--To these three overlapping systems of inspection must be added that of budgetary limitation and control. The League of Nations Disarmament Commission spent many years elaborating a comprehensive system for ensuring that budgetary limitations were observed; by practical application of the system to 90 per cent of the world's military expenditure, the Conference of 1932 proved that the system would provide an important supplementary method of detecting violations of a Disarmament Treaty.

3. The Efficacy of Inspection--Dr. Wiesner has made detailed suggestions about how the physical inspection of military preparations, and the inspection of industrial production could be made to work.

Like Dr. Seymour Melman and his colleagues, he reaches the conclusion that for all forms of armament except a clandestine nuclear stock, the three overlapping systems of inspection with which he dealt (physical inspection of military preparation, inspection of industrial production, and psychological inspection) would:

- (a) be relatively cheap in money and manpower;

- (b) give a very high degree of assurance that a violation of the Disarmament Treaty would be discovered;
- (c) give this assurance in respect to missiles and military aircraft, even in the earlier stages of disarmament, when many of these weapons would still exist.

This conclusion is confirmed by earlier studies of the subject, and by general experience.

- (a) No one has doubted since the Disarmament Conference of 1932 that the inspection of "conventional" forces and armaments would present no difficulty, and that violations could be readily detected.
- (b) This applies a fortiori to the modern missiles and bombing aircraft (see below).
- (c) It is already the fact that, without any system of inspection at all, the General Staffs are able, by military intelligence, to discover almost everything they want to know about the military preparations of other Powers.

4. Inspection and Control of Missiles and Military Aircraft--  
As said above, Dr. Wiesner has shown that the chances of discovering a violation of a limitation on missiles and military aircraft would be very high, even during the period when considerable numbers of these instruments were still in existence.

Once they have been abolished:

- (a) Their manufacture could not possibly be concealed from international inspectors who visited factories and plants where they are made;
- (b) Nor could the tests, trial flights, etc., be concealed; and without tests, etc., they cannot be made operational;
- (c) Nor could the training of personnel in their use be concealed; and without constant training, the personnel could not operate them.



The same considerations apply to aircraft carriers, other surface craft capable of firing missiles, submarines, launching ramps and atomic cannon.

5. Conclusion--The four overlapping inspection systems outlined above would, even without any other special measures, present a disloyal Government with a very real hazard, if it decided to retain a clandestine stock of nuclear weapons.

A considerable number of people, civilian and military, would inevitably be aware of the existence of this stock; and however rigid the discipline imposed upon them, there would be a constant risk that the secret would be revealed to the international inspectors.

#### IV

#### Other Safeguards

1. A U.N. Commission of Scientists to Study Detection--In 1955 the British delegate, Anthony Nutting, suggested in the U.N. Sub-Committee that "a group of scientists" should be invited to study the control of nuclear disarmament in general and the problem of detecting a clandestine nuclear stock in particular. He was forbidden to repeat the suggestion in the General Assembly. This may mean, in view of the British Government policy at that time, that the suggestion was of real importance.

Dr. Wiesner suggests that a search for "mechanical means for detecting clandestine stockpiles" does "not appear a promising undertaking." But he says that "the problem would be largely eliminated . . . if one knew with substantial accuracy the size of a nation's stockpile; then failure to deliver up or to disclose some weapons would be readily known." And he asserts that "much might be done to improve methods for determining past production, so as to make it possible to estimate the existing stockpiles with reasonable accuracy."<sup>1</sup>

Only scientists can offer an opinion on Dr. Wiesner's suggestion; but it may be hoped that COSWA will consider it with special care.

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<sup>1</sup> He also says that "the development of methods of psychological inspection would also contribute to a solution of this problem.

2. Abolition of the Means of Delivery--In the Committee of Ten, on March 15, 1960, M. Moch said:

"There are . . . two ways in which our nuclear fears may be allayed.

"One is to tackle, while there is still time, the means of carrying these weapons--satellites, missiles, aircraft carriers, submarines, launching ramps, etc. Once the vehicles have been banned and destroyed, the military stocks will appear worthless."

The abolition of these means of delivery is in itself a crucially important part of any real disarmament. But it appears at first sight so vast and complex an undertaking that it is natural to think that it must be very difficult to carry through.

In fact, the real difficulty lies in securing the political decision in favour of general and complete disarmament within a measurable period of years. Once this basic decision has been made, it is common sense to start, as M. Moch proposes, with the means of delivery. Nothing else could so swiftly and decisively reduce the dangers of the arms race and of accidental war. Nothing could so effectively prepare the way for the abolition of all the nuclear stockpiles.

There is no technical difficulty in destroying aircraft, missiles, submarines, warships and launching sites. Many of them could be rendered quickly useless by the removal of some vital part.

It is unlikely that existing aircraft, missiles, launching sites, etc., could be hidden, if Mr. Khrushchev's plan of international, on-the-spot control were agreed to. The Intelligence Services of both East and West know so much about the military preparations of the other side that it would be hazardous for a disloyal Government not to reveal its airfields, missile sites, etc.; if it tried to cheat and were discovered, it would incur the animosity of the whole world.

If the abolition of the means of delivery is agreed to, Mr. Khrushchev is probably right in thinking that the more swiftly it is done, the less will be the risk of hitches, difficulties and misunderstandings. Technically twelve to eighteen months is clearly preferable to M. Moch's three to four years.

But how far is M. Moch justified in saying that "once the vehicles have been banned and destroyed the military stocks" (of



nuclear weapons) "will appear worthless"? It has been suggested that a disloyal Government which had retained a clandestine stock could mount a decisive attack against its victim by using civil aircraft, merchant ships, and smuggling.

#### V. The Danger of Nuclear Attack by Civil Aircraft

1. The Problem--It was the argument that civil aircraft could be used to make a sudden devastating attack which defeated the proposal for the total abolition of national Air Forces, made by the Conservative Prime Minister, Stanley Baldwin, and Marshal of the Royal Air Force, Lord Trenchard, in 1932. Looking back, it is easy to see that the argument was then wholly fallacious and that many safeguards could have been devised to prevent the use of civil aircraft for aggression. Anyone who lived through the Disarmament Conference of 1932 and the ensuing war will treat the argument with reserve.

But how great a nuclear attack could now be mounted with the swifter and more powerful civil aircraft which now exist?

It has been said that a resolute aggressor could deliver 100 megatons against the victim nation; that he could do so without any considerable adaptation of the aircraft, and with as few as 500 or 600 men to load and fly them. It is claimed that this operation could be carried through with no serious risk of prior detection, and that, if international inspectors tried to interfere they would instantly be imprisoned or even killed.

Suppose this theory were correct, what conclusion should be drawn?

One hundred megatons is the equivalent in explosive power of 5,000 Hiroshima bombs. Such an attack would mean a terrible disaster to the victim nation, and perhaps lasting damage to its future, no matter how great the area over which the attack were spread.

But it is only one-sixtieth part of 6,000 megatons. If the abolition of the means of delivery cut down the damage which an aggressor could do with his clandestine nuclear stock by 59/60ths, or even by a smaller proportion, it would have rendered a great service to mankind.

2. Could It In Fact Be Done? --Are the assumptions which underlie these estimates of the extent of an attack by civil aircraft really valid?

(a) Adaptation of Civil Aircraft:

(1) The RAF have multi-purpose aircraft, designed to be used for reconnaissance, troop transport, transport of heavy weapons, or bombing. But they require a good deal of work, which takes a considerable time, to adapt them from one use to another; this work would be difficult to conceal.

(2) The same would probably be true of civil aircraft, if they were used for dropping "high yield" (megaton) bombs. They might need special rigging or other changes.

(3) Perhaps the large civil aircraft could be employed without significant adaptation for dropping "low yield" bombs through the doors used for passengers to enter. But there would have to be very many of such bombs; this would require a large organization; if it were to be militarily effective the operation would require a long time to prepare and many people would have to know about it.

(b) Inspection of Civil Aircraft:

These facts make it more probable that the international inspectors would become aware of the intended aggression at an early stage.

It should not be difficult to organize a close and very effective inspection of all civil aircraft. The numbers of such aircraft are at present relatively small. It is estimated that by 1962 the total domestic commercial air fleet of the U. S. A. will amount to 450 planes. It would be simple to organize a daily inspection of a much greater number than this: to inspect the structure of the plane, and indeed to examine every plane and its cargo before every voyage. With such a system, the intending aggressor's risk of detection would be high.

(c) Recruiting the Personnel for Aggression:

Today, in the atmosphere of the cold war, it might



be possible to find 500 or 600 men who would be willing to carry out a plan for dropping 100 megatons of bombs, and to keep the secret while it was being prepared. This is not certain; even now there have been men on each side of the "cold war" who have gone over to the other taking secret information with them, because they disapproved of their own Government's policy.

But a Disarmament Treaty would profoundly alter public thinking about the Charter-breaking use of force, and the members of the armed forces of all nations will not be impervious to that change.

Dropping 100 megatons of bombs after a Disarmament Treaty had been signed, and when the nations of the world had begun to carry it out, would be a crime beside which Eichmann's gas chambers would pale into insignificance. Could any nation really find 500-600 men, of whom not one would feel impelled to reveal to the international inspectors what was being prepared?

The U. S. pilot who dropped the bomb on Hiroshima did so in the sixth year of a world war, and against an enemy who had entered that war by an aggression of unparalleled treachery, and who, in ferocious fighting, had killed hundreds of thousands of his compatriots. He not only made his raid on Hiroshima under military orders; he made it with an assurance that his act would end the war, and would save innumerable lives, both American and Japanese. That assurance was fulfilled; the war ended in a few days' time. Yet such was that pilot's sense of guilt about the destruction of Hiroshima, that he has been in a mental home for many years.

Have we really sunk so far in barbarism that the necessary personnel, on the ground and in the air, could be safely recruited by an aggressor Government for the 100 megaton attack?

(d) The Risk of Accidental Discovery:

Even if 500-600 men could be found who were willing to prepare and do the job, there would still be a great risk for the aggressor that his plans would be accidentally or otherwise revealed. In a disarmed world, and with an alert inspectorate, so large an operation would be very likely to be known; this would be a most serious risk to the aggressor.

3. Conclusion on Civil Aircraft--Summing up these considerations, Seymour Melman's "evasion team," all of them experts, reached this conclusion:

"A moment of reflection on the task of recruiting the needed skills and locating them in the required places, while not betraying to an alert informer by cumulative minor disclosure the whole existence of the plot, is enough to suggest that the flaws in the inspection operation would have to be grotesque to give this sort of activity much chance of success." (Inspection for Disarmament, p. 277).

## VI. The Danger of Nuclear Attack by Merchant Ships or Smuggling

1. Merchant Ships--It might be a simpler matter to put a large number of nuclear weapons in merchant vessels, or even trawlers, and to leave them with time fuses in the ports of the victim country while the crews escaped in other ships. The merchant ships would need no adaptation at all.

But as with civil aircraft, hundreds of highly skilled men would be required to plan, prepare and execute the operation; this would take time; a seaman informer would have exceptional opportunities for asylum elsewhere. Thus the risk of premature disclosure would be high. The damage inflicted on the victim nation might be very severe, but against a nation with a large territory, it could hardly be decisive.

This method of aggression may, therefore, be regarded as less probable than the use of civil aircraft.

2. Smuggling--This would be a hazardous proceeding. Nuclear weapons transported in parts would be liable to detection before they could be assembled at their targets. No aggressor could at present hope to subjugate his victim by smuggled bombs alone.

## VII. Would a Disloyal Government Carry Out a 100 Megaton Aggression?

If all the arguments put forward in the preceding sections are fallacious; if a potential aggressor could, in fact, deliver a 100



megaton attack by civil aircraft, merchant vessels and smuggling, or by a combination of the three, is any Government likely to take the risk which, in a disarmed world, this would involve?

There are political and military considerations which make this unlikely.

1. The aggressor could not hope to "win" the war; under the Disarmament Treaty he would have insufficient forces to occupy the victim's territory. This is a basic fact, which is often forgotten.

2. For such an operation, he could not rely on the help of any allies.

3. He would instantly earn the bitter hostility of the whole world.

4. This would no doubt result in an instantaneous and world-wide diplomatic and economic blockade.

5. Not only so, but even without Treaty obligations for common action (which, of course, there ought to be) the other signatories to the Disarmament Treaty would certainly combine their "internal security" forces against him.

6. He would also have to face the International Force.

7. He would arouse such hatred that he would run the risk of mass-destruction vengeance by the other nations by means of biological and chemical weapons. These weapons can be quickly made in existing plants and at relatively low cost; the equipment for distribution could also be manufactured without delay.

8. The people of the aggressor nation would be instantly aware of all this, and might conclude that the only way to avert a terrible vengeance would be to have an internal revolution and destroy their Government. Indeed, it is barely conceivable that any nation would support their Government in carrying out a 100 megaton aggression after a Disarmament Treaty had been signed.

In short, the 100 megaton aggression would be a very dangerous operation for the Government that undertook it; could in no way advance the national interest of the aggressor country; could not advance, but would gravely compromise, the cause either of communism or capitalism.

Is it not, therefore, justifiable to conclude that the risk of the 100 megaton aggression is less than the risk of allowing the arms race to go on, and that the safer course for every nation is to agree

to peaceful co-existence in a world that has disarmed?

### VIII.

### Conclusion

This paper is an attempt to outline the various overlapping safeguards which might be provided against the danger of a clandestine nuclear stock.

It may seem naive in September, 1961, to discuss it in terms of the kind of disarmament which is discussed above. But since 1919, when the first pledges to disarm were given, there have been several opportunities when disarmament appeared to be within the grasp of statesmanship. They have been lost, due to crises and to other factors largely created by the arms race itself. Looking back, it is clear that disarmament would have been much safer and more "realistic" than the course which was in fact pursued.

If human societies had never created laws because there was a danger that someone would violate the law, should we not all still be living in caves? Can the nations not escape from the caves to which the arms race confines them?

For six years, the clandestine nuclear stock has been the crux of the disarmament discussions, and it will remain so, until a system of agreed solutions has been found. It deserves intensive study by all those who are qualified to undertake the task.

The task should be approached in the spirit of two declarations made by eminent Englishmen in recent years. Sir John Cockcroft wrote in 1957:

"The military consequences of fission and fusion have led to a revolution in military thinking and practice which has still a good way to go. It is clear enough already, however, that our civilization can be destroyed in a night if ever these great forces are released for our destruction. This presents the human race with the greatest challenge it has ever had: to cooperate in disarmament and so to banish the threat which now hangs over the whole world."

"The human race"? Every citizen of every country, according to his knowledge, influence and power.

"The greatest challenge"? In May, 1942, Sir Winston Churchill wrote the following instructions about the synthetic harbours for invading



France on D-Day, known as "Mulberries":

"Prime Minister to Chief of Operations.

"They must float up and down with the tide. The anchor problem must be mastered. The ships must have a side flap cut in them, and a drawbridge long enough to over-reach the mooring of the piers.

"Let me have the best solution worked out.

"Don't argue the matter. The difficulties will argue for themselves."