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THE 16th PUGWASH CONFERENCE

After the excursion to another continent and a different topic at the 15th Conference, Pugwash returned to Europe and to its main problem, disarmament and world security, at the 16th Conference in Sopot. Security in Europe was an obvious topic for a Conference held in Poland, and this was also a good opportunity to receive the report of the Study Group on European Security which had been working for nearly a year. Two of the Working Groups at the Conference were specifically concerned with disarmament and political settlement in Europe. The remaining two Working Groups dealt with the wider problem of G. C. D. and specific measures for arms limitation. This division of areas of discussion among different Working Groups is somewhat artificial, and as usual there was a good deal of crosslinking between the various Groups.

It was inevitable that the war in Vietnam should be discussed at the Conference. Indeed, it would have been inconceivable for a Pugwash Conference to ignore the terrible tragedy of the Vietnamese people, and the threat of the escalation of the conflict. In order to give all participants an opportunity to discuss this problem, a special plenary session was held one evening. Participants did not mince words in expressing horror and indignation at the happenings in Vietnam, but of course such a large gathering could not get down to a detailed analysis and to methods of

solving the problem. This was left to Working Group 3, which has devoted several of its sessions to this issue; its conclusions are contained in the report from that Group. In this respect the discussion on Vietnam served a useful purpose, even though there is not much evidence of this in the public statement issued by the Continuing Committee.

The Conference was sponsored by the Polish Academy of Sciences, and the hosts did not spare any effort or expense to make the gathering a success. All participants were accommodated in the Grand Hotel, one of the largest in Poland, with its own beach; and the weather was kind enough to allow participants to enjoy a swim in the Baltic. The hospitality was magnificent, and a full social programme enabled participants to see something of the country, so rich in historical landmarks, as well as of its cultural and industrial achievements. The Conference has evoked much interest among the Poles, in governmental and scientific circles, as well as the population at large. A special Pugwash date-stamp for franking letters was used by the Post Office during the Conference, and was very popular not only among participants, but also the local population. This is just one example of the thoroughness with which the Polish organizers of the Conference, under their Chairman Professor I. Malecki, have prepared the Conference, and which has in a large measure contributed to its success.

STATEMENT

on the 16th Pugwash Conference on Science and World Affairs

issued by the Continuing Committee

The 16th Pugwash Conference was held in Sopot from the 11th to 16th September 1966. The theme of the Conference was "Disarmament and World Security, Especially in Europe". Under this heading a number of controversial problems of current interest were discussed, including the situation in Vietnam. As in past Pugwash Conferences the discussions aimed at analysing the problems by the scientific approach rather than at finding complete solutions. The discussions have been frank and stimulating and, despite divergence of opinion on some problems, have resulted in better understanding on many of the complex issues of the day and in a number of specific proposals.

The work of the Conference was carried out in four Working Groups, the membership of each Group consisting of scientists from both East and West. Two of these Working Groups, dealing with problems in Europe, have profited from the work carried out during the past year by the Pugwash Group on European Security. The other two Groups were concerned with various aspects of disarmament.

This statement has been drawn up by the Continuing Committee

on the basis of the reports from the Working Groups. In addition, the Conference received a report from the Pugwash Study Group on Biological Warfare, and a summary of this report is included in the statement.

1. Disarmament in Europe

(a) Freeze of Nuclear Weapons. The Group discussed all aspects of the proposed controlled freeze of nuclear weapons in Central Europe, including the freezing of existing stockpiles and of their ownership, as well as the controlled prevention of military application of the nuclear industries in the area under consideration - i.e. the Federal Republic of Germany, the German Democratic Republic, Poland and Czechoslovakia. It was stressed that the freeze, if achieved, could lead to further steps toward reduction of tensions in Europe.

In the discussion on the control and verification of the freeze, the technical difficulties of controlling the movements of small nuclear weapons and smaller components of their delivery systems were stressed.

Some members of the Group pointed to the fact that the current

differences between the U.S. and the U.S.S.R. proposals for a world-wide non-proliferation agreement would also be a stumbling-block for agreement on a freeze in Europe, and that the conclusion of a non-proliferation treaty would increase the chances of an agreement on a freeze. Other members of the Group stressed the difference between the freeze and the non-proliferation treaty and suggested independent pursuit of both steps for the reduction of tensions in Europe.

(b) Military Forces and Conventional Weapons. In view of the reduction of tension which has already taken place in Europe in recent years, it was agreed that an appreciable reduction in the number of troops could and should be undertaken - including a substantial withdrawal of foreign troops to their countries and the corresponding dismantling of their bases. It was agreed that the governments concerned are in a position to satisfy themselves regarding the verification of such a withdrawal without any special control machinery.

Measures should be taken to prevent the withdrawal of foreign troops from being accompanied by an increase in the number of national troops on the part of the European nations affected by the withdrawal.

(c) A Non-Aggression Pact. The values of a non-aggression pact between the NATO and the Warsaw Treaty powers were discussed at a

joint session of Working Groups 1 and 2.

Most participants stressed the value of a non-aggression or mutual security pact, particularly for progress towards German reunification. They observed that such a pact might develop into part of a wider agreement between East and West. Other participants were of the opinion that a non-aggression pact should be a part of a wider political agreement, including real progress towards German reunification. The view was expressed that the difficulty arising from non-recognition of the G. D. R. by the NATO-states can be overcome in a manner similar to that used at the signing of the Moscow Test Ban Treaty, or even in simpler ways.

(d) Observation Posts. An additional measure, discussed at earlier Conferences, and designed to give a greater sense of confidence, would be to set up some simple inspection procedures based upon mutually agreed observation posts at major transport centres in Europe. Such posts would be of value not only in giving some warning of surprise attack, but also in connection with any substantial troop withdrawals and with the implementation of any non-aggression pact which might follow.

2. Reduction of Tensions and Political Settlements in Europe

The Group considered the reduction of tensions in Europe and

the problems of political settlement there. Certain needs for European security can immediately be pointed out, such as recognition of the existing frontiers between the European states; normalization of relations between states with different social systems; peaceful settlement of the German question; and establishment of a lasting system of security based on guarantees by all European countries.

In order to bring about a peaceful settlement of the German question and reunification of that country, in addition to recognition of the existing frontiers between the European states, certain other specific steps should be undertaken:

- (1) Relations between the states of the Warsaw Treaty and the Federal Republic of Germany should move toward normalization and mutual confidence;
- (2) Without raising the issues of recognition, the governments of both German states should encourage mutual co-operation in economic, scientific, cultural, and religious fields through existing or new methods or organizations, and should examine ways of unofficial co-operation in joint external humanitarian operations and in coordinating aid to developing countries. They should also take steps to ease individual contacts between persons living in the separated parts of Germany.

The Group agreed that the eventual reunification of Germany is a necessary part of any lasting system of security in Europe; that it must be achieved by peaceful means and with the full consent of the German people; that a reunified Germany should not represent a threat to European security; and that reunification is likely to be a long and difficult process.

There was also full agreement about the value of larger and freer trade relations between all European states.

Tensions in Europe are related to world tensions, and the war in Vietnam may influence the European situation. Its existence should not prevent continued efforts toward a relaxation of European tensions.

The widening disparity in living standards between the "developed" and the "developing" parts of the world may endanger world security and calls for greatly increased assistance to the developing nations in the technical, educational, and economic fields. Co-operation to this end among all countries, particularly through the United Nations and other international organizations, may contribute substantially to a relaxation of tensions, including those in Europe.

The future organization and development of Europe was a major area of study and discussion. It was

recognized that many processes of a scientific, industrial, or technological nature extend across the frontiers of the European nations.

In the areas of economic and industrial co-operation, problems which clearly extend beyond the borders of many European states include: development of natural resources; exchange of technical knowledge on decontamination of water; methods of control of sources of fresh water for international rivers and lakes; flood control; power development; air pollution; energy policy (coal, oil, nuclear energy, natural gas); weather and climate control; technical standardization; patents; science planning (including scientific and technical exchange); industrial co-production; transportation.

Because many of these problems are highly technical and require the close collaboration of engineers, natural and social scientists, it is recommended that one or more permanent European agencies be set up to deal with them, or that existing agencies be extended, with perhaps a European Conference of specialists on these issues.

New projects of European economic planning, and better co-operation among existing organizations, are required. These, however, should avoid creating such barriers as would produce a still greater gap between the prosperity of Europe and of the developing nations.

Specific proposals for scientific, cultural and political co-operation include: greater participation of the smaller European nations in the many existing international non-governmental organizations; co-operation in education extended and directed toward common textbooks in international relations, international law, etc.; co-operation for exchange of scientists and technical information; exchange of newspaper columns among nations (East-West) and exchange of suitable TV-broadcasts; more participation by countries of Eastern and Western Europe in round table discussions, like those recently held by Poland-Britain and Poland-Denmark; co-operation in projects of technical assistance to the developing countries; international co-operative volunteer services; reduction of travel formalities; abolition of visas, at least between many smaller European nations.

3. Main Problems of Progress towards General and Complete Disarmament (G. C. D.)

The Working Group has considered at length the main problems of progress towards G. C. D.; it has examined some of the obstacles which exist and possible constructive approaches towards a solution.

Different means of strengthening the peacekeeping machinery of the U. N. were discussed. There was, however, a general feeling

that most plans proposed would be unrealistic unless the problems of strengthening the U.N. organization were themselves tackled, for it was the conferring of real power on that organization which was generally at the root of the matter. Where great powers or non-members of the U.N. are involved difficulties are at present often intractable within the U.N. framework. A revival of the original spirit of the U.N. - in particular as it affects the Security Council - was advocated.

In the context of obstacles to G. C. D. particular consideration was given to the problem of the liquidation of foreign bases and the withdrawal of foreign troops from the soil of other nations. The problem was felt to be so complex that it may be desirable to set up an international working group to investigate the transitional difficulties between the present situation and the situation when G. C. D. becomes effective. The Group also recognized the need for the ending of colonialism in all its forms. The Group reasserted its belief that G. C. D. is in the interest of all nations and felt that significant obstacles could be overcome if a progressive liquidation of foreign bases could be achieved.

The proposed International Disarmament Conference in 1967 was welcomed by the Group with the hope that it would give impetus to the work of existing U.N. Committees and of the Geneva

Disarmament Conference in this field. The Group was unanimous that the entry of the Chinese People's Republic into the United Nations was vital to future developments in all areas, including disarmament discussions.

The Group also discussed the problem of Vietnam. The attitude of the Conference to this problem is indicated in section 5.

4. Measures for Arms Limitation

(a) Extension of the Test Ban Treaty. The Group concerned itself with a number of measures for arms limitation. The first one considered was an extension of the nuclear test ban treaty to cover underground tests, the ultimate objective being a Comprehensive Test Ban Treaty. There was general agreement that the status of the technical procedures for detecting, identifying and locating underground seismic events is improving, and general belief that the major obstacles to an agreement are political rather than technical.

Since the problem of on-site inspection appears to remain a major one in negotiations, the Group spent much time in considering possible solutions or arrangements which might be more negotiable, and hence lead promptly to an extension of the present partial test ban. In developing possible alternatives, it was generally assumed that seismic detection systems would be national

with, however, provisions for co-operation and data exchange between nations.

Beyond this the variants were:

1. A threshold treaty with provisions for gradually lowering the threshold.
2. A threshold treaty with additional commitments by the signatory states to refrain from any testing of nuclear weapons.
3. A threshold treaty with additional commitments by the signatory states:
 - (a) to refrain from any testing of nuclear weapons,
 - (b) to co-operate in technical studies aimed at improving the identification capability and at lowering the threshold,
 - (c) to supply whenever requested by any signatory state all feasible information and explanations on unidentified seismic events occurring in its territory.
4. A comprehensive treaty with a provision for locating unmanned seismic stations in the territory of the two or three largest nations, e. g. the U. S. A. and the U. S. S. R., either for validating data from national networks or

for additional help in identifying earthquakes.

5. Provision in a comprehensive treaty of procedures for obtaining more information, including possible on-site inspection of unidentified seismic events, utilizing the "request and invitation" procedure of requesting clarification.
6. As a preliminary to a treaty agreement among the nuclear powers, a limited duration trial period of no testing with provision for the above "request and invitation" procedure.

In the view of the Group the most interesting of the above are variants 3 and 4.

The Group was greatly interested in the proposed establishment of a "Detection Club", to make high quality seismic data available on a broad basis, as an item of possible use to several of the alternative proposals. It hopes the establishment of this organization will proceed rapidly, but it also urges that its establishment not stand in the way of prompt negotiation of an extended treaty; a treaty which, it should be noted, could be of great assistance in preventing the proliferation of nuclear weapons.

(b) Non-proliferation. Non-proliferation of nuclear weapons

remains an urgent matter, and there was consensus that it is of the utmost importance to obtain prompt agreement on a treaty to prevent proliferation, as this would be an important step toward nuclear disarmament. A treaty to accomplish this should be a simple one, in which the nuclear nations agree not to transfer nuclear weapons to other states, and the non-nuclear nations agree not to manufacture or acquire them on either an individual or a collective basis. The Group felt that additional steps would be needed, in which the nuclear powers took positive actions of restraint, and toward decreasing their reliance on nuclear weapons. The problem of guarantees to non-nuclear nations was discussed, but no proposals were developed which seemed likely to find the necessary acceptance. However, the suggestion was generally approved that the nuclear powers should formally agree not to use weapons on nations which do not have such weapons, and on whose territory nuclear weapons are not located.

(c) Nuclear-Free Zones and Regional Disarmament Measures.

Recognizing that any conflict, however small, contains in it the germs of world-wide war, there was discussion of a number of measures which might help in minimizing or eliminating regional conflicts. One especially useful agreement would be the prompt establishment of nuclear-free zones in different areas of the world. Particular note was taken of the

activities of the Polish Government in developing proposals for denuclearization and for a "nuclear freeze" for Central Europe (the Rapacki and Gomulka plans), which could not only be helpful in the development of acceptable plans for Central Europe, but could also be a useful spur to other nations in other areas to develop plans for their own nuclear-free zones, as for example in South America, and in Africa and the Middle East.

In connection with the general problem of arms races among developing nations, the value of limitations on the supplying of arms by industrial nations to others, and the importance of regional arms limitation agreements of various types, in addition to nuclear-free zones, were pointed out by some participants.

(d) Nuclear Freeze Proposals.

The topic of possible world-wide freeze agreements was discussed in the particular context of the likely development and deployment of antiballistic missile systems (ABM). At least three types of such freezes were considered:

- (i) a freeze on the deployment of ABM systems;
- (ii) a freeze on the numbers of offensive nuclear delivery systems, especially missiles;
- (iii) a freeze on total number of nuclear delivery systems.

No general agreement was reached on any one of these.

(e) Peaceful Uses of Atomic Energy. In the context of the clearly desirable expanded development and peaceful utilization of atomic energy, it is very important to have adequate and uniform control arrangements to ensure that fissionable nuclear materials are used as scheduled for peaceful purposes. A single international system for this control is clearly desirable, and the Group recommended the universal support and use of the currently available international system, that of the International Atomic Energy Agency.

5. Vietnam

The problem of Vietnam was discussed in detail at a plenary session specially devoted to this subject, as well as in Working Group 3. While there was an extensive and frank exchange of views among the participants, the Conference was unable to arrive at any agreed conclusions on the causes and nature of the war and on possible ways for bringing to an end this dangerous and tragic conflict.

6. Problems of Biological Warfare

Progress has been reported by the Pugwash Study Group on Biological Warfare, part of whose work has now been taken over by the Stockholm International Peace Research Institute (SIPRI). At the last meeting of the Study Group, held in Stockholm 4-6 September, attention was given to technical possibilities for the development of rapid detection methods for microbiological agents (including viruses and toxins). Specific research was defined in this field, to be undertaken by a group of scientists from Eastern, Western and non-aligned countries, and to be carried out under the auspices of SIPRI. The meeting in Stockholm also examined the results of four trial inspections of microbiological laboratories in Austria, Sweden, Denmark and Czechoslovakia, carried out during the spring and summer of 1966.

Both these activities of the Biological Warfare Study Group represent a useful contribution to the problem of biological weapons disarmament and their control.

Abstracts of the papers presented at the Sopot Conference
will be printed in the next issue.

LIST OF PARTICIPANTS AND OBSERVERS

in the 16th Pugwash Conference

Prof. V. Y. Aboltin (U.S.S.R.)	Dr. A. Kolesnyk (G.D.R.)
Prof. I. Adamczewski (Poland)	Prof. K. Kopecki (Poland)
Mr. D. J. Adler (Denmark)	Prof. H. Krøger (G.D.R.)
Mr. H. Afheldt (F.G.R.)	Dr. A. Kruczkowski (Poland)
Prof. I. Agarbiceanu (Rumania)	Dr. M. Lakany (U.A.R.)
Dr. N. Z. Alcock (Canada)	Mrs. Betty G. Lall (U.S.A.)
Prof. P. V. Andreyev (U.S.S.R.)	Prof. K. Lapter (Poland)
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Dr. M. Blusztajn (Poland)	Prof. I. Malecki (Poland)
Dr. R. Björnerstedt (Sweden)	Acad. I. Malek (Czechoslovakia)
Prof. H. Bondi (U.K.)	Dr. H. Marcovich (France)
Dr. L. M. Brown (U.K.)	Prof. E. Menzel (F.G.R.)
Prof. K. Boulding (U.S.A.)	Acad. M. D. Millionshchikov (U.S.S.R.)
Prof. J. Bukowski (Poland)	Prof. S. Muller (U.S.A.)
Mr. Hedley Bull (U.K.)	Mr. T. Nemec (Czechoslovakia)
Prof. V. Butozan (Yugoslavia)	Mr. A. N. Nesterenko (U.N.)
Dr. S. Cyvin (Norway)	Dr. P. L. Ølgaard (Denmark)
Prof. M. J. Desai (India)	Prof. R. E. Peierls (U.K.)
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Prof. F. J. Dyson (U.S.A.)	Prof. E. Rabinowitch (U.S.A.)
Prof. W. S. Emelyanov (U.S.S.R.)	Prof. L. Raiser (F.G.R.)
Prof. B. T. Feld (U.S.A.)	Prof. L. Reczei (Hungary)
Prof. B. H. Flowers (U.K.)	Prof. A. Rich (U.S.A.)
Dr. S. Freier (Israel)	Prof. G. Rienäcker (G.D.R.)
Prof. J. Galtung (Norway)	Prof. J. Rotblat (U.K.)
Prof. G. Giacometti (Italy)	Prof. V. A. Sarabhai (India)
Prof. Bentley Glass (U.S.A.)	Prof. M. D. Shulman (U.S.A.)
Mr. W. F. Gutteridge (U.K.)	Dr. V. V. Shustov (U.S.S.R.)
Prof. V. Hajdu (Czechoslovakia)	Prof. P. B. Smith (Netherlands)
Prof. V. Hanga (Rumania)	Prof. A. Snejdarek (Czechoslovakia)
Prof. L. Infeld (Poland)	Acad. M. Sorm (Czechoslovakia)
Mr. A. Joxe (France)	Mr. S. Stone (U.S.A.)
Dr. R. Jungk (Austria)	Prof. N. A. Talensky (U.S.S.R.)
Dr. M. Kaplan (W.H.O.)	Prof. H. A. Tolhoek (Netherlands)
Acad. V. A. Kargin (U.S.S.R.)	Acad. A. P. Vinogradov (U.S.S.R.)
Acad. V. M. Khvostov (U.S.S.R.)	Prof. B. M. Vul (U.S.S.R.)
Prof. H. A. Kissinger (U.S.A.)	Dr. J. Wilhjelm (Denmark)
Prof. A. Klafkowski (Poland)	Mr. J. K. Wright (U.K.)

REPORT OF WORKING GROUP 1

DISARMAMENT IN EUROPE

The main topic for the Working Group was Disarmament and Collateral Measures in Europe. This was discussed according to the following agenda:

1. Freeze, non-proliferation, reduction and elimination of nuclear weapons in Europe.
2. Freeze and a denuclearized zone specifically in Central Europe.
3. Reduction of military forces and conventional weapons.
4. Non-aggression pact between the NATO and the Warsaw Treaty countries.
5. Elimination of risks of surprise attack.

The first two items were taken together during our discussions.

1. Freeze

The Group discussed in detail the proposals for a controlled freeze of nuclear weapons in Central Europe. All forms of such a freeze were scrutinized: the freezing of existing stockpiles and the owner-

ship, as well as the controlled prevention of military application of the nuclear industries in the area under consideration - i. e. the Federal Republic of Germany, the German Democratic Republic, Poland and Czechoslovakia. It was stressed that the freeze, if achieved, could lead to further steps toward reduction of tensions in Europe.

Some of the discussion pertained to the problem of control and verification related to the creation of the freeze zone. Especially the technical difficulties of controlling the movements of small nuclear charges and smaller components of their delivery systems were stressed. Furthermore, some members of the Group pointed to the fact that the seemingly only remaining difference between the U. S. and the U. S. S. R. proposals for a world-wide non-proliferation agreement would also be a stumbling-block for agreement on a freeze in Europe. Thus, the non-proliferation of nuclear weapons would be more easily achieved through such a direct approach. Furthermore, these members of the Group were of the opinion that the conclusion of a non-proliferation treaty would increase the chances of an agreement on a freeze zone.

Other members of the Group stressed the differences between the

freeze and the non-proliferation treaty in Central Europe, and the value of both steps for the reduction of tensions in Europe.

2. Non-Proliferation

After only a short discussion the Group confirmed its support for the earliest possible agreement on non-proliferation. The question of control and verification in connection with such a treaty was considered to be relatively easy to solve, although no discussion on this subject took place, since it was understood that this matter would be treated by Working Group 4. At the moment divergencies between East and West in this matter are apparently centred on European problems only. Should it, however, transpire, as negotiations proceed, that the present European difficulties disappear, while difficulties arise in other parts of the world, then there would be a particular value in proceeding directly to a purely European non-proliferation treaty in the first instance, although such an European treaty should not include any clause which might impede progress towards a global non-proliferation treaty.

3. De-nuclearization

Various proposals for the creation of a de-nuclearized zone in Europe were discussed in very great detail, but it was not possible to reach agreement.

4. Military Forces and Conventional Weapons

Several aspects of the problem related to disarmament and collateral measures regarding conventional weapons were discussed.

Due to the reduction of tensions, which has already taken place in Europe in recent years, it was agreed that a tangible reduction in the number of troops could and should be undertaken - including a substantial withdrawal of foreign troops to their countries and the corresponding dismantling of their bases. It was agreed that the governments concerned are in a position to satisfy themselves regarding the verification of such a withdrawal without any special control machinery. In the case of additional withdrawal of foreign troops, special control measures should be devised.

Collateral measures should be undertaken in order to prevent the withdrawal of foreign troops from being accompanied by an increase in the number of national troops on the part of the European nations affected by the withdrawal.

A brief discussion on such measures took place with special attention to the possible consequent reduction of military budgets.

5. The Non-Aggression Pact

The values of a non-aggression pact between the NATO and the War-

saw Treaty powers were discussed in some detail at a joint session of Working Groups 1 and 2.

Most participants stressed the value of a non-aggression or collateral security pact and expressed their opinion that it could be of real value for the progress towards German reunification. At the same time they observed that such a pact might form a part of a wider agreement between East and West.

Other participants were of the opinion that a non-aggression pact should form part of a wider political agreement including real progress towards German reunification.

The members of the Group from the two parts of Germany expressed the view that such an European non-aggression Pact

would be an important step towards German reunification. Even the difficulty of non-recognition of the G.D.R. by the NATO-states can be overcome in the same way as was done at the signing of the Moscow Test Ban Treaty, or even in simpler ways.

6. Observation Posts

An additional measure, discussed at earlier conferences, and designed to give a greater sense of confidence, would be to set up some simple inspection procedures based upon mutually agreed observation posts at major transport centres in Europe. Such posts would be of value not only in giving some warning of surprise attack, but also in connection with any substantial troop withdrawals and with the implementation of any non-aggression pact which might follow.

REPORT OF WORKING GROUP 2

REDUCTION OF TENSIONS AND POLITICAL

SETTLEMENTS IN EUROPE

1. Problems of European Security

In accordance with the draft agenda, the Group discussed, under point 1, problems of European security. First, European security needs have been considered. This

discussion was the continuation of considerations at previous Pugwash Conferences. Agreement was reached that some objective and common needs for European security can already be established, as for instance the recognition of the existing frontiers between the European

states; normalization of relations between the European states with different social systems; peaceful settlement of the German question; and the promotion of a lasting system of security in Europe based on the guarantees of all European countries. Special security needs felt by some nations or important groups of populations cannot be identified without further research in this field, including polls of public opinion. It is recommended that the Pugwash Study Group on European Security include this point in the programme of its future activities.

Recognizing the importance of a peaceful settlement of the German question, including the reunification of Germany, the Working Group expressed the view that this process can be helped by some measures aiming at the recognition of the existing frontiers between the European States, and at a lessening of the severity of the division of Germany. Concrete measures to be taken have been discussed, and the following suggestions for steps that could be taken in the near future have been agreed:

- (1) Relations between the States of the Warsaw Treaty and the Federal German Republic should move toward normalization and mutual confidence.
- (2) The Governments of both German States, without raising the issues of recognition, should encourage mutual co-operation in the econ-

omic, scientific, cultural and religious fields, through the operation of already existing and new methods and organizations; and should examine ways of unofficial co-operation in joint external humanitarian operations, and in co-ordinating aid to developing countries. The two Governments should take steps to ease individual contacts between persons living in both the existing parts of Germany.

The utility of the normalization of relations between the F. G. R. and the Socialist states in Central and Eastern Europe was generally recognized, as well as the fact that it is most probable that this process of normalization will develop step by step. Some participants strongly opposed the idea that the German Democratic Republic should be included in this process on the same level as the other Central and Eastern European states; other members expressed the view that there can be no lasting settlement in Europe without the recognition of the G. D. R.

The reunification of Germany was accepted by all members of the Group as a necessary part of any lasting system of security in Europe, and the fact was stressed that this process must be fulfilled only by peaceful means and with the full consent of the German people, and that the reunified Germany should in no way represent a threat to European security. It was generally agreed that the reunification is likely

to be a long and difficult process.

Complete agreement was reached about the utility of larger and freer trade relations between all European states, and a recommendation is made to the Study Group on European Security to study this problem.

In the discussion on inter-relations between world tensions and tensions in Europe, the fear was expressed of the bad influence exercised by the war in Vietnam on further development of the security in Europe. There was a difference of opinion as to the extent of the influence of this war on the European situation. The Group agreed that it should not prevent continued attempts towards relaxation of European tension.

A grave new danger to security of all nations arises from the widening disparity in living standards between the "developed" and the "developing" parts of the world. This confronts all developed nations with a common challenge and calls for greatly increased efforts in assistance to the developing nations in the technical, educational and economic fields. Co-operation in these fields among all developed countries, particularly through the United Nations and other international organizations, may contribute substantially to the relaxation of tensions between them.

The Working Group considers it to be necessary for the

Study Group on European Security to continue its work. It recommends that the Study Group should consider co-opting representatives of the great powers.

2. Problems of the Future Development of Europe

The Group discussed problems of the future organization of Europe on the basis of the reports of the Pugwash Study Group on European Security and of other contributions to the Conference. It was felt that many integrational processes extend beyond the frontiers of the present European nations, are inherent in the nature of modern science, technology and industry, and should therefore be promoted in spite of differences in the social systems in Eastern and Western Europe. It was suggested that an increase in communication and co-operation between Eastern and Western Europe may lead to a lessening of tensions. Contacts seem to lead to an effective lessening of tensions, when they consist of co-operation satisfying the following conditions: (a) equality exists between the parties; (b) it is a lasting and functional co-operation; (c) the co-operating parties obtain results which they could not get otherwise.

A number of concrete recommendations were made concerning increasing collaboration in (a) the economic and industrial fields (b) scientific, cultural and political relations.

2.1. Economic and industrial co-operation. The discussion has shown that, especially in the following fields, problems exist which extend beyond the borders of many European nations:

- (1) development of natural resources;
- (2) exchange of technical knowledge on decontamination of water; methods of control of sources of fresh water for international rivers and lakes; flood control; power development;
- (3) air pollution;
- (4) energy policy (coal, oil, nuclear energy, natural gas);
- (5) weather and climate control;
- (6) technical standardization; patents;
- (7) science planning (including scientific and technical exchange);
- (8) industrial co-production;
- (9) transportation.

Many of these problems are highly technical and require the close collaboration of engineers, natural and social scientists. It seems useful that one or more

permanent European Agencies be set up to deal with these topics (or be extended where certain international bodies already exist). It was proposed that the European Pugwash Study Group should make more detailed proposals, which may lead to a European Conference of specialists on these issues.

One may also propose new projects of European economic planning, and better co-operation among such existing organizations as European Economic Community (EEC), Council for Mutual Economic Aid (Comecon), and European Free Trade Association (EFTA). However, one should avoid creating such barriers between Europe and developing nations that the gap in prosperity between them is thereby increased.

2.2. Scientific, cultural and political co-operation. The following specific suggestions have been made in these fields:

- (1) The importance of many international non-governmental organizations was stressed; much scientific collaboration already exists. It is important that also the smaller European nations participate greatly in these relations.
- (2) Co-operation in education could be further extended and should include work directed towards common textbooks in international

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| relations, international law, etc. | pattern established e.g. between Poland and Britain, and between Poland and Denmark. |
| (3) Co-operation for exchange of scientists and technical information. | (6) Nations of Eastern and Western Europe could co-operate in projects of technical assistance to the developing countries; one may also think of international co-operation in volunteer services. |
| (4) Exchanges of newspaper columns among nations (East-West) and exchange of suitable TV-broadcasts. | (7) Travel formalities could be greatly reduced; visas could be abolished at least between many smaller European nations. |
| (5) More nations in Eastern and Western Europe could be engaged in round table discussions on the | |

REPORT OF WORKING GROUP 3

MAIN PROBLEMS OF PROGRESS TOWARDS GENERAL AND

COMPLETE DISARMAMENT (G. C. D.)

1. The Working Group has considered at length the main problems of progress toward G. C. D.; it has examined some of the obstacles which exist and possible constructive approaches towards a solution. There has throughout been agreement that it is difficult to predict which of the world's present problems are likely to be currently resolved and which residual difficulties will remain for the future. There was, however, expressed a feeling that there may be on the part of politicians a greater pessimism than was actually justified because of a tendency

to continue to talk about conflicts from which the real tension had actually already drained away. In some cases too, convenient excuses were emphasized which, in fact, disguised the real difficulties. In general the Group felt that while the situation over the last ten years had shifted to produce a better balance of world opinion, there had recently been a deterioration in international relations due to the escalation of a war. It was, however, felt that the solution of particular problems ought not to be made a precondition of easing international tension, and that G. C. D. itself would

only be valid if the arrangements were universal and embraced all nations. It was with these considerations in mind that the Group considered the main points of its deliberations.

2. Current Conflicts - Vietnam

The Working Group gave separate and special consideration to the problem of Vietnam.

There was considerable discussion about the causes of the war: some wished to condemn what they called the American aggression, others wished to condemn the attack on South Vietnam by what they called North Vietnamese guerillas and main force units. All agreed that an end of the tragic destruction of human life was the first consideration. Great dismay was expressed at the escalation of the war and in particular at the use of new types of chemical weapons including those for the destruction of agricultural crops. Some felt that Vietnam was being used as a proving ground for such weapons.

Detailed procedures for ending the war were discussed and the Group heard views about the history of the relations of the Vietnam people with China. Some felt that negotiations could start on the basis of the so-called "Four and Five Points" Conditions. Other possibilities were also put forward. It was felt, however, that the basis for a solution was the Geneva Agreement of 1954. A section of partici-

pants felt that there should be continued appeals to all countries to bring the belligerents to the conference table including the major powers, the co-chairmen of the 1954 Geneva Conference and the countries of the International Control Commission of Vietnam. Some members of the Group have expressed a view that in order to avert danger of a new world war it is vitally necessary that the U.S. Government should stop bombing the Democratic Republic of Vietnam and areas of Laos, withdraw all its troops as well as the troops of U.S. allies from Vietnam and put an end to the intervention. Others emphasized the importance of stopping the intervention from the North. A substantial part of the Group suggested action involving a call for an immediate cessation of hostilities, based on the following conditions: a standstill order for all combatants, no firing except in self-defence (that is when fired upon), subject to supervision by the international commission and with a view to convening a conference for negotiation, with all combating groups represented. Members of the Group thought that contact between scientists in the rest of the world and those of Vietnam might help to the discovery of a solution and also to assist that country in the process of civilian reconstruction.

Consensus was reached in the following areas:

The Working Group views with the gravest disquiet the con-

tinuing escalation of the war in Vietnam, which may lead to a third world war and has already brought the world into a new phase of the arms race. While there were fundamental disagreements about the actual causes of this bitter conflict, there was complete support for urgent steps to be taken to bring it to an end.

The Group regrets the violent death of so many people, both combatant and non-combatant, due mostly to the indiscriminate nature of warfare. Scientists of the whole world must be concerned about the increasing use of science for the destruction of human lives and vital resources.

The only possible way out of this disastrous situation is a negotiated settlement on the basis of the 1954-62 Geneva Agreements including the withdrawal of troops foreign to South Vietnam and the cessation of any foreign intervention which is contrary to the terms of those agreements. The Vietnamese people North and South of the provisional demarcation line should be free to settle their own affairs without war and violence and without outside interference as stipulated in those agreements.

The Working Group recommends an appeal to all scientists in the world to make every effort towards this solution of the Vietnam conflict.

The disastrous situation in

Vietnam is a reminder that the role of science in world affairs has not been effective in preventing war. Science has in fact become an increasingly effective tool in the conduct of war. The Group urges that a world-wide effort be made to turn science into a more effective tool of peace and development.

The Group recommends to the Continuing Committee its urgent attention to the question of setting up a Study Group on Vietnam. The Study Group composed of eminent scientists from neutral countries, should be asked to undertake a profound scientific analysis of all possible ways and means of stopping the escalation of the conflict and ending the war.

3. Means of Strengthening the Peacekeeping Machinery of the U.N.

3.1. Attention was drawn to the financial obstacles in the way of effective peacekeeping action and to the need for formalized agreements between the U.N. Security Council and individual countries to place forces at the disposal of the U.N. Such agreements should reflect the differing abilities of nations to finance their contribution of armed forces to the U.N. for peacekeeping operations. The financial difficulties of the U.N. are real but it was recognized that financial problems can be solved more easily as solutions are found to more substantive issues.

3.2. There was considerable

support for the notion that treaties of non-intervention by major and minor powers should be encouraged with U.N. guarantees and the provision for U.N. mixed teams to investigate automatically complaints by a country of outside military intervention including shipment of arms, other military assistance and infiltration and training of armed agents. It was felt that there were areas like Africa, Latin America and possibly Asia where a start could be made with a reasonable chance of success and the hope that such a system might become world-wide.

3.3. There was, however, a general feeling that most plans of this and similar nature would be unrealistic unless the problems of strengthening the U.N. organization were themselves tackled, for it was the conferring of real power on that organization which was generally at the root of the matter. Where great powers or non-members of the U.N. were involved difficulties were at present often intractable within the U.N. framework. A revival of the original spirit of the U.N. - in particular as it affected the Security Council - was advocated. There was support for a number of steps including the following:

- 3.3.1. The encouragement of the governments of major powers to recognize their joint obligations to the cause of peace.

- 3.3.2. Consideration of the possibility of a kind of mandatory right to membership of the U.N. on the basis of certain predetermined criteria by which the existence or not of a state could be assessed. In this way perhaps steps could be taken towards the resolution of the Chinese representation and other membership questions.

4. The Liquidation of Foreign Bases and Other Obstacles to G. C. D.

Consideration was given to the problems implicit in the existence of foreign bases and the stationing of foreign troops on the soil of other nations which may give rise to dangerous situations. Many participants saw this questions as one closely related to the development of the peacekeeping functions of U.N. Instances which were not simply a survival from the period of imperial rule often arose because states sought unilateral assistance because of the indeterminate and slow nature of the relevant U.N. procedures. Until real reliance was placed on these, countries would be tempted to seek military assistance from particular sources in order to secure their own frontiers and generally to maintain stability as they defined it. It was agreed that G. C. D. ought eventually to make this unnecessary and that the real problems lay in the intermediate period. It was felt by some that

during this period foreign bases might provide a measure of local stability and even be seen as an alternative to nuclear escalation in the general strategic context; others regarded such bases as altogether undesirable and invariably a source of instability. The proposed withdrawal of British troops from Aden was cited as a measure in the interests of the stability of South Arabia. Interesting distinctions were drawn between different categories of foreign military involvement on the soil of another state, varying from that of long historical standing which was a total anachronism, to cases where assistance had been enlisted for the purposes of self-defence. The whole problem was felt to be so complex that the Group agreed to recommend to the Continuing Committee the setting up of an international working group along the lines of those which have considered European Security and biological warfare to investigate the transitional difficulties between the present system and the situation when G. C. D. becomes effective. It was felt that particular attention should be given to the types of situation which could arise between two adjoining states and to procedures whereby the intervention of other powers, whether solicited or otherwise, could be obviated. The possibility of an informal understanding between major powers about the use of the veto was felt to be a relevant issue for investigation.

The Group agreed to assert its belief in the principle of G. C. D. as being in the interest of all nations and felt that significant obstacles could be overcome if a progressive liquidation of foreign bases could be achieved. The Group also recognized the need for the ending of colonialism in all its forms.

5. The Position of China

The Group was unanimous in recognizing that the Chinese People's Republic's entry into the United Nations was vital to future developments in all areas including disarmament discussions. While the view was expressed that this might be best approached by China's involvement in the specialized agencies of the U.N., many thought that only a standing invitation to membership with a seat on the Security Council and at the 18-Nation Disarmament Conference at Geneva may have a chance of acceptance.

It was felt that the absence of China from Pugwash Conferences was regrettable not only from the point of view of disarmament discussions but because of the relevance of the Chinese attitude to peace and social change particularly in the developing countries. They, therefore, wish strongly to recommend renewed attempts to get Chinese representation at conferences, if necessary by sending a small mission led by the Secretary-General to China. They also felt that urgent consideration should be given in detail to the re-

solution of the difficulties existing over Chinese representation at the U.N.

6. The Projected International Disarmament Conference in 1967

The notion of this proposed conference was welcomed by the Group with the hope that it would give an impetus to the work of existing U.N. Committees and of the Geneva Disarmament Conference in this field.

With regard to the general prospects for disarmament, the question was raised to what extent economic interests could still constitute an obstacle to its achievement: it was widely appreciated that some risk to national security on the part of certain powers might occur on the road to disarmament but that in any case few countries could any longer rely on military strength - as opposed to an improved international environment - for their safety.

The Group was particularly concerned that a thorough examination should be made of the causes of, and international responses to local conflict situations, particularly in Asia, Africa and Latin America. Some participants pointed out the necessity for the time being of "ad hoc" agreements on the supply and limitation of arms with guarantees of non-intervention and non-aggression agreements. This was felt to be a proper and important element

of the detailed study proposed in para. 4 above. The chances of an initiative from groups of developing countries anxious to avoid the consequences of an arms race were thought in this connection to be reasonable, but like a number of other questions discussed this did bring to mind the obvious need to invite substantial representation of African, Asian and Latin American countries to future Pugwash Conferences; there was felt to be a certain unreality and indeed danger in discussions on such questions without the presence of some of those most immediately affected.

7. Fields for Further Investigations

The Group's attention was drawn to the need for more detailed expert knowledge in a number of fields and consideration was given to the means by which this could be assembled. There were a number of areas apart from that already mentioned where research was an urgent prerequisite for further worthwhile discussions. Some had been mentioned in papers submitted for discussion by participants in the Conference; of these the problem of control, the question of a nuclear umbrella in connection with plans for G. C. D. and the economic and social consequences of arms and disarmament seemed to the Group to be so important that they wished strongly to recommend Pugwash International Study of these in the next year in preparation for the 17th Conference. Whether this could be arranged or not it was strongly

advocated that Pugwash should endeavour to encourage investigation by Pugwash Study Groups in particular countries and re-

search by appropriate institutes and individuals into some of the vital aspects of international peace and disarmament.

REPORT OF WORKING GROUP 4

MEASURES FOR ARMS LIMITATION

Working Group 4 concerned itself with a number of measures for arms limitation. Although these are discussed separately below, the Group is conscious that they are in fact interrelated in many ways and must often be considered for their utility in quite different areas than the ones in which they are principally discussed. Most of them also have a double interest; they are both useful for their own sake and useful as preliminary steps along the path toward true disarmament.

1. Extension of the Test Ban Treaty

An important measure for arms limitation is a Comprehensive Ban on Nuclear Weapons Tests. This long-sought-after measure is particularly important today because it offers major assistance to the problem of non-proliferation of nuclear weapons.

The technical questions involved are those of detecting, locating and identifying underground seismic events. Progress

continues to be made in these technical areas, and the Group took note of the recent U.K. report* which concludes that a high quality world-wide system of seismic array detection stations should detect and identify over 90 per cent of earthquakes of magnitude 4 and larger. It was further agreed by all participants that, because of the multiplication of statistical probabilities for a series of several tests taking place in the same region, a series of tests would be enormously more difficult to hide than a single test. Thus, there is an improved technical basis for obtaining an agreement to extend the prohibition of nuclear explosions to include underground tests, and the Group believes that the major existing obstacles to an agreement are rather of a political than a technical nature.

*

United Kingdom report of Dec. 1965, "On the Detection and Identification of Underground Nuclear Explosions". See also the article by Bullard in the July 1966 issue of Scientific American, pages 19 to 29.

The Group took note that in the discussions and negotiations on these questions it has been argued that a treaty banning underground tests must provide for on-site inspection, to give as much assurance as possible that small seismic events, detected but not identified, are in fact of natural origin. The counter-argument which was advanced by some participants is that the existing means of detection and identification are adequate and that, therefore, there is no real need for on-site inspection. It is in this area that some resolution appears to be needed.

The Group considered a number of possible solutions or arrangements which might permit the obtaining of a full test ban. Although no one of the ways was without some difficulty or objection all were of some interest and merit further study. Most of them assumed that the seismic detection systems would be nationally operated, with, however, provisions for co-operation and data exchange among nations.

Beyond this the variants were:

- (1) A threshold treaty with provisions for gradually lowering the threshold.
- (2) A threshold treaty with additional commitments by the signatory states to refrain from any testing of nuclear weapons.

(3) A threshold treaty with additional commitments by the signatory states:

- a) to refrain from any testing of nuclear weapons,
- b) to co-operate in technical studies aimed at improving the identification capability and at lowering the threshold,
- c) to supply whenever requested by any signatory state all feasible information and explanations on unidentified seismic events occurring in its territory.

(4) A comprehensive treaty with a provision for locating unmanned seismic stations in the territory of the two or three largest nations, e.g. the U.S.A. and the U.S.S.R., either for validating data from national networks or for additional help in identifying earthquakes.

(5) Provision in a comprehensive treaty of procedures for obtaining more information, including possible on-site inspection of unidentified seismic events, utilizing the "request and invitation" procedure of requesting clarification.

- (6) As a preliminary to a treaty agreement among the nuclear powers a limited duration trial period of no testing with provision for the above "request and invitation" procedure.

In the view of the Group the most interesting of the above are variants (3) and (4).

As further items which should accelerate the obtaining of a comprehensive ban, the Group was greatly interested in the proposal for the establishment of a "Detection Club" by interested nations, the objective being to make high quality seismic data available on a broad basis. It also noted that the Stockholm International Peace Research Institute may be receptive to the suggestion that it undertake a further study and analysis of the technical problems and possibilities for further improvement of capabilities with a view to advancing the obtaining of a comprehensive test ban treaty.

2. Non-proliferation

Non-proliferation of nuclear weapons remains an urgent matter and there was a consensus that it is of the utmost importance to obtain prompt agreement on a treaty to prevent proliferation. This would be an important step toward nuclear disarmament. In the Group's view a treaty to accomplish

this should be a simple one in which the nuclear powers agree not to transfer nuclear weapons to other powers and the non-nuclear powers agree not to manufacture or acquire them on either an individual or a collective basis. There do not appear to be any insuperable barriers to the obtaining of such a treaty, and the Group urges continuous and vigorous negotiations to this end.

While generally agreeing to the desirability of a simple treaty, the Group felt that additional steps would be needed in which the nuclear powers took positive actions toward restraint and toward decreasing their reliance on nuclear weapons. Some participants emphasized the need for co-operative arrangements to give positive assistance in meeting the security needs of countries which agree to deny themselves nuclear weapons. Discussion on possible forms of such guarantees did not, however, bring out any solutions likely to obtain the necessary acceptance. A specific proposal which met with much approval, was that the nuclear powers formally agree not to use nuclear weapons on nations which do not have such weapons, excepting, however, those non-nuclear nations on whose territory are located nuclear weapons.

3. Nuclear-free Zones and Regional Disarmament Measures

Recognizing that any conflict, however small, contains in it the germs of world wide war, the Group

discussed a number of measures which might help in minimizing or eliminating regional conflicts.

One especially useful agreement would be the prompt establishment of nuclear-free zones in different areas of the world. In connection with nuclear-free zones, the Group took particular note of the activity of the Polish government in developing proposals for denuclearization and for a "nuclear freeze" for Central Europe. The study and concern which led to the development and presentation of the Rapacki and Gomulka plans should be helpful in developing acceptable plans for Central Europe and should also be a useful spur to other nations in other areas to develop plans for their own nuclear-free zones. Hope was specifically expressed that nuclear-free zones be agreed to in South America, and Africa and the Middle East.

In connection with the problem of arms races among developing nations, some participants stressed the importance of limitations on the supplying of arms by industrial nations to others, and the importance of regional arms limitation agreements of various types in addition to nuclear-free zones. Some members of the Group felt that the proposal of the delegate from Malta to the U.N., that there should be compiled and published an annual inventory of the transfer and sale of conventional armaments, would represent a useful first step

towards the limitation of the traffic in such arms, but others argued that this would have no practical utility.

4. Nuclear Freeze Proposals

The topic of nuclear-free zones leads naturally to the question of possible world-wide freeze agreements and these were discussed in the particular context of the likely development and deployment of anti-ballistic missile systems. Individual participants spoke on the possible utility of at least three types of nuclear freezes:

- a) a freeze on the deployment of ABM systems;
- b) a freeze on the numbers of offensive nuclear delivery systems, especially missiles;

There was no general agreement on any one of these. In the discussions it was, however, agreed that in this connection self-restraint on the part of the nuclear powers in their nuclear weapons activities could serve a very useful purpose. Such restraint, along with other related measures, would constitute both a desirable measure of arms limitation in its own right, and also an aid in obtaining a non-proliferation treaty.

5. Peaceful Uses of Atomic Energy

The positive side of the problem of atomic energy is that of peace-

ful uses, and the Group urged full vigour in their development and application. All nations with substantial nuclear capability and technical knowledge have a special responsibility to assist other nations in the rapid development of their own peaceful programmes.

An important component of these peaceful programmes is an adequate control system to ensure that all the fissionable materials are accounted for and are used as scheduled for peaceful purposes*. In view of the

*

The Group is aware that the conclusion of a Comprehensive Test Ban Treaty would, without further arrangements, exclude the possibility of any programmes of peaceful nuclear explosions.

rapidly developing use of nuclear power plants and the consequent large production of plutonium, it is of particular importance to have available and to utilize a satisfactory and uniform control arrangement. The available international system is the International Atomic Energy Agency, and the Group recommends its full support. Some of the Group also noted their belief that the practice in some bilateral agreements for peaceful applications, and especially the Euratom practice of substituting their separate control systems for that of the IAEA, has significantly weakened the latter control system. The Group recommends that there should be only one international control system covering peaceful atomic applications - that of the IAEA.

P U G W A S H E V E N T S

CONTINUING COMMITTEE

Meetings of the Continuing Committee were held in Jablonna, Poland, on 7th and 8th September, and in Sopot on 16th and 17th September 1966. Much of the agenda was concerned with the detailed planning of the Sopot Conference and with the preliminary programme for the 17th Pugwash Conference in Sweden. The Committee also received reports from its various Study Groups, and made decisions concerning the organization

and programmes of work of these Study Groups.

In connection with the Ronneby Conference, there was a general discussion on the future of Pugwash; a sub-committee was set up to draft a programme for future activities for presentation to the Conference. To help participants in assessing the work carried out up to now, the Committee decided that a revised edition of the History of Pugwash be prepared.

17th PUGWASH CONFERENCE, RONNEBY, SWEDEN

SEPTEMBER, 1967

The 17th Pugwash Conference will be held in Ronneby (south Sweden) from September 3rd to 8th, 1967.

At that time ten years will have passed since the first Pugwash Conference, and five years since the 10th Conference in London, when the present Continuing Committee was elected. The Committee felt that another large Conference should be convened, in which those who have participated in the past Pugwash Conferences should be given an opportunity to discuss the Pugwash activities up to now, and to decide about future activities.

The title of the Conference will be the same as that of the London Conference, i.e. "The Scientist and World Affairs". Apart from receiving a report of past activities and making decisions about the future programme and organization, including the election of a Continuing Committee, the programme will contain symposia on disarmament problems and on global co-operation in science and technology.

The Conference will be organized by the Swedish Pugwash Group with the co-operation of SIPRI (Stockholm International Peace Research Institute).

SCIENCE IN ARGENTINA

At its recent meeting the Continuing Committee considered the plight of scientists in Argentina after recent events, and decided to send the following letter to the President of the Argentinian Republic:

The Pugwash Conferences on Science and World Affairs, of which 16 have been held to date, and which bring together eminent scientists from all parts of the world, are based on the conviction that science plays, in our time, a key role not only in war, but also in the peaceful development of nations.

Our Conference on Science in Aid of Developing Countries

which was held in Addis Ababa, in January 1966, and which was attended by scientists from all parts of the world, including Latin America, agreed unanimously that the future of countries in the process of industrialization depends on rapid advancement of science and technology. We are, therefore, particularly distressed by the events which took place recently in Argentina and which led to the loss to Argentina of many of its outstanding and internationally known teachers, scientists and technologists. We most emphatically appeal to the Argentina Government to adopt policies which would avoid this disaster to their own country, and stimulate vigorous growth of science and technology in Argentina.

PUGWASH STUDY GROUP ON BIOLOGICAL WARFARE

The Pugwash Study Group on Biological Warfare met in Stockholm from the 4 - 6 September on the initiative of the Swedish Pugwash Group and with the financial support of SIPRI (Stockholm International Peace Research Institute). The following took part: Mr. O. Berner (SIPRI); Dr. R. Björnerstedt (SIPRI); Prof. T. Caspersson (Sweden); Dr. G. Edsall (U.S.A.); Prof. C. G. Heden (Sweden); Dr. I. F. Ph. Hers (Netherlands); Acad. A. Imshenetsky (U.S.S.R.); Dr. M. Kaplan (U.S.A.); Prof. A. Kirn (France); Dr. J. Leerhøy (Denmark); Dr. Patricia Lindop (Pugwash Continuing Committee); Prof. M. Meselson (U.S.A.); Prof. R. C. Nairn (Australia); Dr. J. Riha (Czechoslovakia); Dr. M. Ritzen (Sweden); Prof. J. Rotblat (Pugwash Continuing Committee); Dr. L. Tammelin (Sweden); Dr. C. E. D. Taylor (U.K.), and Dr. B. Zacharias (Sweden).

The main purpose of the meeting was to discuss and assess the methods of rapid detection of microbiological agents (including viruses and toxins) which might be used in biological warfare. In addition the meeting discussed other relevant problems, such as the control of biological weapons by voluntary inspection, and the conditions for a ban on testing of

biological weapons.

The Study Group has learned with satisfaction that SIPRI is willing to sponsor and to consider financing some of the projects described below. For this reason the recommendations made here are mainly directed to the Board of Governors of SIPRI. However, some of the problems are of a nature requiring action by a wider scientific body, and therefore some of the recommendations in this report are directed to the Pugwash Continuing Committee.

I. A Study of Rapid Detection Methods

(A) Reasons for the study

This particular study is considered to be of importance because:

1. East-West collaboration of scientists would be achieved on a problem important both for defence and public health.
2. The work would foster the principle of open research and thus help to decelerate and eventually stop research and development of biological weapons.
3. World-wide agreement would be encouraged with the prospect of inhibiting preparation for biological warfare.
4. Successful efforts would result

in important advances in public health and medical practice.

(B) Technical aspects of the project

The meeting discussed many methods of detection, focusing on particle discrimination, nucleic acid recognition by acridine orange staining, and immunofluorescence. Consideration was also given to the possible future developments such as annealing procedures for nucleic acids, ultramicrodeterminations of compounds characteristic of bacteria, e.g. d-alanine, gas chromatography, mass spectroscopy and microcalorimetry.

The immunofluorescence technique was discussed at length and the following conclusions were reached.

1. It could play a useful part in a system of early (1-4 hours) detection of airborne microbes which might be used in biological warfare. Specific identification could be obtained within 24 hours.
2. Before such techniques could be usefully applied, a considerable amount of technical development would be required, although many items of the equipment may be already commercially available. There are so far no complete assemblies,

which should comprise non-specific and specific methods incorporating:

- a) Sample collector
- b) Particle analyser
- c) Transport system with plastic tape (polypropylene etc.)
- d) Nucleic acid detector e.g. by acridine orange
- e) Specific detection by immunofluorescence
- f) Microscopy, scanning and recording
- g) Computing

4. It is very difficult at this preliminary stage to estimate the cost of developing a complete assembly including equipment and personnel but it is thought that the cost would be of the order £100,000. It would probably take about 5 years to produce a working system and efforts should be made to start the project quickly with a view to completion in such a specified period. However, important savings in money and time could result from using pre-existing and donated equipment. Valuable technical information would be generated even during the early stages of the work.
5. At the same time as the equipment is being designed and constructed, development of reagents could take place as a separate exercise. Testing of these would not in the first instance require very elaborate equipment. The development of group-specific antisera and polyvalent serum mixtures

should be started immediately.

6. A consultative group of experts should be formed to advise on the development of prototype equipment and of the necessary reagents.
7. Consideration should be given to:
 - i) the need to incorporate rapid automatic culture for viruses;
 - ii) verification methods requiring:
 - a) amplification of antigenic mass (growth in media and tissue culture, animal inoculation)
 - b) appropriate groupings of specific antisera for sequential differentiation of specific microorganisms
 - c) automatic microtechniques for serological procedures e.g. complement fixation, haemagglutination, precipitation
 - d) automatic colony identification.

(C) Recommendations

From the above technical discussions it was concluded that the following recommendations would help to implement the project:

1. A research team should be formed consisting of young scientists from East, West, and non-aligned nations, e.g. Czechoslovakia, Denmark, and Sweden, under guidance of a consultative group of experts.
2. The research team should be constituted under the auspices of SIPRI.
3. The work should be carried out in an already established laboratory willing to make available its facilities and technical resources.
4. It would be greatly desirable if the research activities could be carried out in laboratories associated with the Ministry of Defence, for instance the Defence Research Laboratory in Sweden or the Microbiological Research Establishment at Porton in the U.K. This would have a great impact on the ultimate aim to abolish secrecy of all work connected with biological warfare.

II. Inspection Experiment

The meeting received a report from the group headed by Professor Heden, which had been charged with carrying out the first stage of the voluntary inspection scheme.

This experiment was based on an agreement between the heads of four laboratories and with the knowledge of relevant authorities. The laboratories represented different

areas of specialization (large scale facilities for pathogens, public health responsibility, general microbiology) as well as different political situations:

1. The Medical Research Council Group for Bacteriological Bioengineering, Stockholm, Sweden (a neutral country)
2. The State Serum Institute, Copenhagen, Denmark (a country belonging to NATO)
3. The Institute of Hygiene, Vienna, Austria (a country bound by treaty not to produce biological weapons)
4. The Institute of Microbiology, Academy of Sciences, Prague, Czechoslovakia (a country belonging to the Warsaw Pact).

The inspection team consisted of Professor Heden (Sweden), Academician Malek (Czechoslovakia), Dr. Leerhøj (Denmark) and Professor Möse (Austria). The first visit (Stockholm, May 4-5th) was preceded by an independent consultation with specialists from the Western European Union. They did not participate in the Pugwash activity and carried out their visit independently, at the private invitation of the head of the laboratory in question. The members of the Pugwash team

could however start their work on the basis of a very useful demonstration. The problem was approached in a stepwise fashion over the next two inspections (Copenhagen, May 5-6th; Vienna, May 9-10th) and was simplified by a conference with the inspectors of the International Atomic Agency in Vienna. The round of visits was concluded in Czechoslovakia (August 25-26th) where not only the laboratory in Prague was visited, but also an affiliated germ-free animal research facility 200 km. away from the city.

The meeting appreciated the importance of such inspection schemes, as one of the efforts to reduce secrecy in the biological weapons field, and as a stepwise approach in a control and inspection system.

The meeting concurred with the recommendation of the inspection team that a working group be set up under the auspices of SIPRI to elaborate plans for a control and inspection agency in such detail that they can be submitted for consideration by governments. The meeting also received a document setting out in detail proposals for the non-production control of biological weapons and the organization of such control.

III. Study of the Possibility of a Test Ban on Biological Warfare

It is likely that the development of operational biological weapons of the aerosol type would entail extensive large scale field trials for the determination of the

physical, meteorological and biological behaviour of various agent clouds.

The possibility exists that, under certain circumstances, the occurrence of such a test might be detected at distances remote from the test site.

For these reasons a preliminary study should be undertaken to determine whether or not such detection is sufficiently within the realm of feasibility to justify more detailed technical investigation, possibly including a certain amount of actual experimentation.

As for the arms control applications of a possible biological weapons test detection capability, two rather different cases can be imagined.

a) The feasibility of developing a highly efficient detection system might justify consideration of some sort of Test Ban treaty, possibly along the lines of the Partial Nuclear Test Ban Treaty.

b) The availability of a system of lower efficiency, but with still a significant probability of detecting unusual concentrations of potential biological warfare agents, may nevertheless make it possible to obtain substantial arms control benefits. For example, if a group of states were to co-operate in maintaining such detection facilities the

following beneficial effects may result:

- i) it would provide some reassurance that none of the participating states themselves were engaged in biological weapons field testing;
- ii) it would concretely demonstrate to other states the serious concern of the participating states that biological weapons not be developed or used;
- iii) it would introduce a serious possibility that actual tests would be detected. Even in the absence of a biological weapons test ban agreement, this might seriously inhibit non-participating states from conducting large scale biological weapons tests.

All three of the above effects would help to maintain and reinforce the widespread agreement that biological weapons are not legitimate instruments of war.

The meeting recommends that:

a) One or two qualified persons should be asked to prepare a preliminary technical study.

b) The above study should be presented in the form of a report to a meeting of the Pugwash Biological Warfare Study Group for discussion and further recommendations. Participants in this meeting should be

asked to prepare themselves to discuss the report which should be submitted to them well in advance of the meeting.

IV. Relations with Other Organizations

The meeting learned of proposals: (a) to establish co-operation with the International Association of Microbiological Societies in the setting up of an Open Laboratories Club, as well as on the issue of the ethics of applied microbiology; (b) to co-operate with relevant international organizations in calling a large conference on the peaceful uses of microbiology.

Whilst time did not permit a detailed discussion of these proposals, the meeting was

in general sympathy with the idea of establishing contact with international scientific organizations, and recommends these proposals for consideration by the Pugwash Continuing Committee.

V. General Recommendation

It is recommended that another meeting of the Biological Warfare Study Group should be scheduled to receive the interim reports of the various projects in order to assess their results and to recommend subsequent steps.

While projects requiring continuing studies should be sponsored by SIPRI it is felt important for the Study Group to retain its direct connection with the Pugwash Continuing Committee because of the political aims to be achieved by the work.

STUDY GROUP ON EUROPEAN SECURITY

The third meeting of the Study Group on European Security was held in Geneva on 21st to 24th May. The following took part: D. J. Adler (Denmark); H. Afheldt (F.G.R.); R. Bjørnerstedt (Sweden); G. Bluhm (F.G.R.); J. Delbrück (F.G.R.); P. Freydenberg (Norway); V. Hajdu (Czechoslovakia); P. Hess (G.D.R.); I. Højme (Denmark); K. Lapter (Poland); R. Leclercq (Belgium); L. Liska (Czechoslovakia); S. Lundgren (Sweden); I. Malecki (Poland); L. Mates (Yugoslavia); T. Opsahl (Norway); J. Peck (G.D.R.); L. Reczei (Hungary); M. Saeter (Nor-

way); R. Sexl (Austria); A. Snejdarek (Czechoslovakia); A. Sparring (Sweden); P. Stroot (Belgium); I. Supek (Yugoslavia); H. Tolhoek (Netherlands); J. Wilhjelm (Denmark), and H. Wünsche (G.D.R.). Academician Khvostov and the Secretary-General took part as observers on behalf of the Continuing Committee.

The following papers were presented:

D. J. Adler. "Integrational Processes"
H. Afheldt and G. Bluhm. "Security in Europe"

The Danish Pugwash Group. "On Denuclearized Zones"

V. Hajdu and E. Menzel. "The Problem of a Peace Treaty with Germany and a European Security System"

P. Hess and S. Lundgren. "Notes on Economic Co-operation between East and West"

E. Menzel. "Addendum to the Paper The Problem of a Peace Treaty with Germany and a European Security System"

K. Lapter. "Poland's Security and the German Question"

L. Reczei. "Proposals on German Reunification and European Security"

L. Liska and A. Snejdarek. "Security in Europe and More Extensive Co-operation of European Countries"

H. Thirring. "The Classic Idea of Security"

Sub-group of Lawyers (V. Hajdu, E. Menzel, T. Opsahl, J. Peck, L. Reczei, J. Wilhjelm and H. Wünsche). "Report on the Question of a Peace Treaty with Germany"

R. U. Sexl. "Austrian Security Needs"

I. Højme. "Danish Security Needs"

The Norwegian Group. "Norwegian Security Needs"

The papers were discussed at the Plenary Sessions as well as in four groups as follows:

- (a) Lawyers group on a Peace Treaty with Germany
- (b) Group on problems connected with the reunification of Germany
- (c) Working Group on Security
- (d) Working Group on Integrational processes and co-operation between European States.

It was agreed that the findings of the meeting will be summarized in a report to be presented to the 16th Conference. The Co-Chairmen, Adler and Snejdarek, were asked to prepare a draft report. This was discussed at the fourth meeting of the Group, which was held in Jablonna on the 7th and 8th September, just before the Sopot Conference.

SUMMER SCHOOL ON DISARMAMENT

The Italian Pugwash Group organized on June 13th to 25th, 1966, an International Summer School on Disarmament and Arms Control. It was held at the Villa Falconieri in Frascati, near Rome. The main lectures were given by G. Arangio Ruiz (Padova), R. Björnerstedt (Stockholm), W. Epstein (U.N.), K. Lapter

(Warsaw), M. Marcovic (Belgrade), B. V. Röling (Groningen), T. Stonier (New York) and P. Sylos Labini (Rome). Additional lectures were given by E. Burkhardt (UNESCO), F. Cavalletti (head of the Italian delegation at the ENDC in Geneva) and W. Grayson (member of the American delegation at the ENDC in Geneva).

The 22 students came from 9 countries (Czechoslovakia, Denmark, German Federal Republic, India, Great Britain, Italy, Poland, United States and Yugoslavia). There were also some 10 observers.

Lectures and discussions centred on various aspects of disarmament and arms control, especially on the effects of a nuclear war; the political and strategic aspects of the nuclear age; the history of disarmament negotiations; problems of controls and safeguards; peacekeeping in a disarmed world; economic aspects of armament and disarmament; and sociological and psychological problems of the nuclear arms race.

There were also some round table discussions on civil defence and on European security.

The discussions were on a fairly high level, as the students (with very few exceptions) have done their homework properly. Throughout there was a very friendly and cordial atmosphere, and the informal discussions sometimes continued for many hours after the formal closing.

The Italian press reported the seminars at length. This has

helped in educating public opinion in Italy on the dangers of atomic warfare. The Pugwash Movement itself received much publicity in this connection.

Professor E. Amaldi, director of the School, gave the following reason for arranging the Summer School:

At the beginning of the Pugwash Movement the scientists played the most important role, especially those connected with nuclear physics; at that time the most urgent problems were those concerned with solutions that demanded technical understanding. At present, however, political and sociological aspects of disarmament are coming to the foreground. This demands the development of other forms and methods, in addition to the Conferences which are held every 9-12 months. In this respect the Frascati School is an experiment in new methods of achieving Pugwash goals.

The Frascati School experiment was certainly successful; it should stimulate similar experiments in other countries, especially those directly or indirectly involved in the nuclear arms race.

(K. L.)

SOUTH EAST ASIA REGIONAL PUGWASH CONFERENCE

On the initiative of the Australian Pugwash Group a Regional Conference is being organized in Melbourne on 23rd to 27th January 1967. The theme

of the Conference will be "Scientific, Technological and Industrial Development in South East Asia". A number of scientists from South East Asian countries are being invited.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

The International Institute for Peace and Conflict Research, in Sweden (abbreviated name: SIPRI - (Stockholm International Peace Research Institute)) came into being on July 1st, 1966. The first meeting of the Board of Governors was held in Stockholm on 27th and 28th August.

The Institute will be international in the scope of its studies, in its research staff and governing bodies. It shall be entirely independent in the conduct of its studies and the publication of its results. When recruiting personnel the Institute will give foremost attention to scientific ability and research performance. It will try to establish gatherings of scholars, at which different social and economic systems will be represented, and where peace and conflict research problems and disarmament questions will be studied under genuinely international aspects.

The Swedish Government has allocated about 1 million Swedish Crowns (200, 000 US\$) for its first year of activity. It is foreseen that this contribution will gradually increase as the research activities are expanded.

It is envisaged that the pace of the development of the Institute will be such that at the end of the initial five year period some 15-25 persons will be employed on the research staff. This staff will

comprise scholars of recognized high standing, as well as post-graduate workers appointed as research assistants.

The following are the governing bodies of the Institute:

(a) A Scientific Council consisting of 24 members selected from among highly qualified scholars, politicians and international civil servants. The Council shall have consultative functions in the planning of the research programmes and in their evaluation.

(b) A Governing Board with eight members which will have the responsibility for the more important decisions about the programme of the Institute and its management.

(c) A Director whose tasks will be to organize the Institute and guide its activities.

The Swedish Government has appointed the members of the Governing Board and two thirds of the members of the Scientific Council. The Council itself will be responsible for the selection of the last third of its membership, as well as for selection of scholars to replace retiring members.

The following are the members of the Board of Governors appointed so far:

Ambassador Alva Myrdal,
temporary Chairman

Professor Hilding Eek,
Professor of International
Law, Stockholm University

Academician I. Malek,
Prague, Czechoslovakia

Professor J. Rotblat,
Secretary-General, Pugwash
Conferences on Science and
World Affairs, London

Professor B. V. A. Röling,
Secretary-General, Internat-
ional Peace Research Associ-
ation, Groningen, Holland

Professor J. Sanness,
Director of the Institute of
International Relations, Oslo

The geographical distribution of the Council will be considerably broader than that of the Board, and will include representatives from other continents, as well as from Europe. A Director will be appointed later. Two temporary assistant directors have been appointed to launch the Institute and to prepare the programme for the initial period.

Below is an outline of the research projects which were considered by the Board.

(a) Study project on biological means of war.

This project aims at studying the means of preventing further development of biological weapons before they get operationally useful and universally available.

The Board decided that a project of this kind should be started at the Institute. Studies should be undertaken on the feasibility of an international control

system of the production of means of biological warfare. Political, legal and technical problems would have to be considered, including verification techniques, both in relation to production and to detection of use.

As part of this project the Institute participated in a meeting of the study group, held in Stockholm on 4 - 6 September, and arranged by the Swedish Pugwash Group. This meeting was particularly concerned with rapid detection techniques.

(b) The Board considered various projects in the disarmament field. It decided to ask the Secretariat to prepare for forthcoming meetings plans of projects on different problems relating to disarmament, e.g. active defence against nuclear weapons (ABM), as well as passive defence measures.

(c) The Board discussed some projects in the field of social science. It was decided that the Secretariat should prepare plans of projects relating to the role of mass media in the development of certain localized conflicts.

(d) The Board expressed considerable interest in problems of how the international community could benefit from natural resources being made accessible e.g. the sub-soil of the high seas, as well as the utilization of satellites, particularly for communications purposes.

(e) The Board learnt of the possibility of conferences being held in Stockholm in 1967 by the Pugwash

Conferences on Science and World Affairs and the International Peace Research Association. Scholars from all over the world working in fields related to the Institute's

activities will participate in these conferences. The Board welcomed the opportunity to co-operate in the preparation of these meetings.

CONFERENCE ON INTERNATIONAL PENAL LAW

A Conference on International Penal Law is being organized by the French Resistance Organizations (Le Comite d'Action de la Resistance, le Comite d'Action de la Resistance Judiciaire, l'Association des Anciens Deportes et Prisonniers de la Famille Judiciaire et le Reseau du Souvenir) and will be held in Paris on 27th to 29th April 1967.

The Conference aims to study crimes against humanity and peace, and to investigate the conditions for the setting up of an International Penal Court.

The study of crime against humanity will include the physical suppression of groups of human beings or individuals, not only for racial or national reasons but also for political ones. The crime against peace will be studied under all aspects, but mostly with respect to nuclear weapons.

The establishing of an International Penal Court is associated with the setting up of an International Department of Public Prosecution, which will be empowered to nominate inspectors, among them scientists; it is intended that the staff will be independent of national interests. This Court might

provide preventive jurisdiction for international crimes.

Participants at the Conference will be lawyers from various countries, selected because of their knowledge of the subject. In addition, it is planned to invite scientists as experts on aspects relevant to their particular field. Travel expenses and accommodation will be provided by the organizers.

A total of about 100 participants is expected, including 10-20 scientists. It is anticipated that the work will be carried out by working groups, which will prepare reports similar to the procedure at the Pugwash Conferences.

This Conference will probably be the first of a series, although the number and frequency have not yet been determined. It is hoped that a Continuing Committee will be elected at the first Conference.

The discussions and reports of the working groups will be private; participants would represent only themselves. A summary of the reports may be issued at the end of the Conference by a drafting Committee.

More details can be obtained from Dr. H. Marcovich, Institut du Radium, Rue d'Ulm 26, Paris 5, France.

DUTCH COMMITTEE AGAINST THE PROLIFERATION
OF NUCLEAR WEAPONS

A Committee against the Proliferation of Nuclear Weapons was set up in the Netherlands at the end of 1965. In the opinion of the members of the Committee attempts to reach a balance of powers between nations by means of weapons of mass-destruction constitutes one of the greatest dangers threatening the survival of mankind. A particularly dangerous situation is developing at present because of the increasing spread of nuclear weapons. For this reason the Committee considers opposition to the spread of nuclear weapons to be a matter of the highest priority. The Committee is anxious to stimulate discussions on this subject in the Netherlands and has suggested the following points as a basis for such discussions:

1. The extension of the Moscow Nuclear Test Ban Treaty to all nuclear tests.
2. The realization of a treaty against the spread of nuclear weapons, in which nuclear nations, as well as non-nuclear nations, would participate.
3. A freezing of the situation regarding nuclear weapons in Central Europe. It would follow from this that West Germany should be denied access to nuclear weapons in any form, and that the plans for MLF, ANF etc. be not carried out.
4. The establishment of nuclear-

free zones in Central Europe, as well as in other parts of the world, e.g. Latin America and Africa.

The Committee felt that an important contribution to the achievement of one of its objectives, to inform public opinion of the dangers of the spread of nuclear weapons, would be to publish a pamphlet on this subject. This pamphlet was prepared jointly by Miss Fenna van den Burg, Mr. Laurens ten Cate and Professor H. A. Tolhoek.

After an introduction stating the purpose of the publication, the pamphlet explains the concept of proliferation of nuclear weapons, traces the history of negotiations on a non-proliferation treaty, and points out the various difficulties in reaching such an agreement in the light of recent attempts at other international agreements. Some methods of checking the spread of nuclear weapons, even in the absence of an agreement on non-proliferation, are then discussed. The pamphlet ends with a list of recommendations about the main points which a treaty on non-proliferation should contain, and the specific tasks for the Netherlands in this respect.

Further information about the Committee and the pamphlet can be obtained from the Committee's Secretariat, R. R. Eijbersen, Maasstraat 61, Amsterdam-Z, Netherlands.

THE CONTINUING COMMITTEE
OF THE PUGWASH CONFERENCES ON SCIENCE
AND WORLD AFFAIRS

Chairman:	Lord Russell
Secretary-General:	Prof. J. Rotblat
Members:	
United Kingdom	Prof. R. E. Peierls Prof. C. F. Powell (Vice-Chairman)
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Western Europe	Prof. E. Amaldi (Italy) Dr. H. Marcovich (France)
Eastern Europe	Prof. L. Infeld (Poland) Acad. I. Malek (Czechoslovakia)
Asia	Prof. V. Sarabhai (India)
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