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P U G W A S H N E W S L E T T E R

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THE DUBROVNIK CONFERENCE

The Eleventh Pugwash Conference, held at Dubrovnik from 20th to 25th September, 1963, was on all accounts a great success. The discussions were amiable and constructive, and the Working Groups presented reports containing many valuable suggestions. The venue of the Conference, in the spacious and beautifully designed rooms of the Umjetnicka Galerija (Art Gallery), as wellas the unique grace and loveliness of Dubrovnik itself, have contributed to the creation of the right atmosphere. To a very large measure the Conference owes its success to the tremendous effort put in by the Yugoslav Organizing Committee which consisted of I. Supek D. Kanazir, E. Kos, L. Josifovic, M. Lazanski and V. Knapp, particularly the last two who were responsible for the administration of the Conference.

It is hoped to publish in the next issue of the Newsletter impressions from several participants in the Dubrovnik Conference. The Proceedings of the Conference will be prepared as soon as the Central Office acquires the necessary secretariat. In the meantime we give below the text of the Press Statement issued by the Continuing Committee, as well as a list of participants.

PRESS STATEMENT

Issued by the Continuing Committee of the Pugwash Conferences on Science and World Affairs

The 11th Pugwash Conference on Science and World Affairs was held in Dubrovnik from 20 to 25 September 1963. These conferences bring together distinguished scientists from East and West for frank and informal discussions on important problems of common interest; particularly those related to the threat of nuclear war, the problem of achieving general and complete disarmament, and ways of ensuring the widespread application of science for peaceful purposes.

The Dubrovnik Conference was organized by the Continuing Committee of the Pugwash Conferences, of which the Secretary-General is Professor Joseph Rotblat of London, together with a Yugoslav Organizing Committee under the chairmanship of Professor Ivan Supek. The Conference was sponsored by the Council of Yugoslav Academies. Among the 64 participants from 24 countries there were 13 from the U.S.A., 11 from the U.S.S.R., and 7 from the U.K. In addition there were 14 observers.

The main theme of the Conference was "Current Problems of Disarmament and World Security", and five Working Groups were formed to consider the folowing topics:-

1. Problems of General Disarmament.
2. Consequences of the Spread of Nuclear Weapons.
3. Denuclearized zones, especially in Central Europe and the Balkans.
4. Role of Non-Aligned Nations in Disarmament and World Security.

5. The Partial Test-ban, the Problems of Detection, and the Next Steps.

The timing of the meeting, following so closely on the successful negotiation of a Nuclear Test-ban Treaty, was fortunate, and the friendly, co-operative and hopeful atmosphere of the discussions was immediately apparent to the participants. The reports of the Working Groups were substantial and showed that much progress had been made in reaching a common understanding on important practical issues, in giving consideration to clarifying different points of view, and in raising novel suggestions which can be studied and given further consideration at subsequent conferences.

Prevention of Surprise Attack

In Working Group 1, two important proposals were made relating to the prevention of surprise attack in Central Europe, where NATO and Warsaw Pact countries face each other. It is essential that both sides should assure themselves against surprise attack since this would make possible a mutual reduction of conventional defence forces, and eventually of nuclear forces also. It could thus greatly help in the creation of atom-free zones in Central Europe.

Firstly, it was suggested that rapid agreement might be obtained for establishing control posts at major transportation centres within agreed areas of Central Europe. These posts would give warning of any surprise attack which required the massing and transport of large numbers of conventional arms and forces. The control posts would be equipped with all necessary facilities for access and communication.

Secondly, it was suggested that military officers from each side would be stationed and should reside with the troops of the other side within the agreed areas. These officers would have adequate means of communication with their own governments. It was suggested that the details should be worked out by military experts of the countries concerned.

Minimum Deterrent Force

The Group also discussed as a first step in disarmament the destruction of all nuclear delivery vehicles whatsoever, except for the creation of a minimum deterrent, or "umbrella", force which would be sufficient to deter, but not sufficient to allow an aggressor to wage a major thermonuclear war. It was thought that a very substantial number of vehicles could be eliminated in less than a year.

The Group agreed that during the period of disarmament, world security would have to be guaranteed by the umbrella forces of the U.S.A. and U.S.S.R. alone. Most participants thought, however, that the adoption of a substantial measure of nuclear disarmament by these two major powers might be sufficient to persuade the other nuclear powers to forego their nuclear forces altogether, and so make it very difficult for any further country to enter the nuclear arms race.

Control and Inspection

The Group agreed that control and inspection of the process of disarmament should be effected by a permanent International Disarmament Organization enjoying all necessary privileges and powers. They state

that the possibility that any power could cheat by evading inspection has been grossly exaggerated, but that the inspection system has not only to maintain security and prevent cheating, but also has to alleviate the fears that cheating might occur. Since no inspection system can be perfect, greater efforts might profitably be made to devise machinery to deal openly with the doubts and fears which must inevitably arise from time to time. Inspection would also be eased if short-range tactical weapons could be drawn back from an atom-free zone between East and West.

Limiting the Spread of Nuclear Weapons

In Working Group 2 several valuable contributions were made. First, that since the development of nuclear reactors in many countries might lead to a proliferation of nuclear weapons, control of fissile materials should be made more effective, and the major powers should transfer their fissile materials through the International Atomic Energy Agency rather than, as is often now the case, through bilateral agreements; and that the IAEA should assume full control of such transfers. Further, to avoid the waste of manpower and resources by many small nations which would follow from the development of their own nuclear technology, international centres for peaceful nuclear technology, especially power-production, should be set up and should be organized along the lines of the present successful international centres for pure research. In such centres, all nations would be able to contribute and gain experience and skills on a common, open basis. The second contribution was an appraisal of the argument sometimes used to justify atomic bomb construction - that important scientific and technical forces are thus created for the strengthening of the industrial and economic capacity of a country. It was concluded that further bomb-production in our present circumstances, would be a grossly inefficient way of securing such technical and scientific advantages. They can be obtained much more economically by other methods.

As further steps for the prevention of the spread of nuclear weapons, the Group recommended that the security of countries which forego the construction of nuclear weapons should be guaranteed by the strengthening of the system of collective security, and that the Great Powers should accept a special responsibility for this within the framework of the U.N. Such countries should also be supported by making available to them the scientific and technical knowledge which they might have gained from the production of nuclear weapons. The Group also agreed that some form of sanctions should be established against any power which undertakes the testing or production of atomic weapons, after a complete test-ban has been signed and a substantial measure of disarmament achieved.

Atom-free Zones

In Working Group 3 there was a fruitful discussion about atom-free zones, and two specific recommendations were made. The first, to all governments directly concerned in Central Europe, suggested that they should enter into negotiations leading to the lessening of tensions in the area and to the establishment of a denuclearized Central Europe. The second proposed that the governments of the Balkans, Africa and Latin

America should conclude a treaty banning nuclear weapons from that part of the world and conforming to the U.N. Charter, with arrangements for international inspection.

Non-Aligned Nations

Working Group 4 stressed the contribution which could be made by non-aligned nations by their renunciation of nuclear weapons, and by establishing atom-free zones as a contribution towards complete disarmament. The Group also suggested that the non-aligned nations, either individually or collectively, should set up institutes or groups for the study of the military, strategic and technological problems met in disarmament. Such institutes should maintain close contact with the various disarmament officials of individual states, and with the U.N. and its special agencies. Such action could allow the creation, in good time, of a competent body of personnel for the support of an International Disarmament Organization.

Extending the Test-Ban

Working Group 5 stressed the importance of early progress towards general disarmament in order that the international confidence generated by the Moscow Conference may be maintained. Even steps with no great military significance should be sympathetically considered since they may help in improving the political climate. The Group suggested that scientists should take every opportunity to influence public opinion so that the Test-ban Treaty shall be adhered to by all nations (including France and the People's Republic of China). It expressed the opinion that any further tests in the atmosphere, water, or outer space would not only increase radioactive fallout, but could also contribute to the breakdown of the Test-ban Treaty and to a further escalatory series of atomic tests.

To assist in extending the test-ban to include underground tests, the Group suggested that not only should the work of individual states on underground explosion and earthquake detection be continued and intensified; but also that international collaboration in this field should be established. A co-ordinated seismological programme, with full interchange of records of explosions and earthquakes, should be begun by the U.S.A., U.S.S.R. and U.K., with other nations contributing later. Improved methods of detection would diminish the ambiguities in the interpretation of the seismic records and increase the precision with which the origins of such events can be established. In addition, an international seismological station, manned by specialists from different countries, could be established in a politically suitable and seismologically quiet area. Another recommended step which would have the effect of increasing international confidence was that a ban on orbiting nuclear weapons should be negotiated between the major powers.

International Scientific Co-operation

Many of the proposals for international scientific co-operation made at the Seventh Pugwash Conference (Stowe, Vermont, in September 1961) have already been agreed or formally proposed. They include various forms of co-operation in space, plans for a world medical and biological research centre, a broadening of the U.S.-U.S.S.R. exchange of scientists, and projects to drill deep into the Earth's crust, such as the Mohole project.

The Group considers that there are still further projects worthy of serious consideration.

In spite of widespread agreement on many important issues amongst members of the Conference, a number of questions remained unresolved and several novel suggestions require further consideration. These will be taken up at the next Pugwash Conference to be held in Udaipur, India, towards the end of January, 1964. The agenda for this Conference will also include discussions on technical, medical and scientific assistance to the development of new nations.

LIST OF PARTICIPANTS AND OBSERVERS

AT THE DUBROVNIK CONFERENCE

A. PARTICIPANTS

Australia
Dr. J.W. Burton

Austria
Prof. H. Thirring

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Prof. R. Fisher
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Acad. A.P. Vinogradov
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Mrs. Ruth Adams
Prof. H. Kissinger
Mr. D. Lang

Yugoslavia
Prof. A. Moljk

UNESCO
Mr. W.A. Mills
Prof. Tha Hla

W.H.O.
Dr. M. Kaplan

Professor O. Haxel

KRYPTON-85 IN THE ATMOSPHERE

The processing of burnt-up fuel elements from uranium reactors is associated with the production of gaseous radioactive products which, for technical reasons (extraction and storage difficulties), are usually released into the atmosphere. The most important nuclide of this group is krypton-85, which is also formed during explosions of fission bombs.

By the end of 1962 the concentration of krypton-85 amounted to 7 picocuries per cubic metre of air at standard temperature and pressure. This krypton-85 comes predominantly from nuclear industrial plants[1]; the contribution from nuclear tests is only about 10% of the total amount. The predominant origin from nuclear industrial plants is borne out, in the first place, by the fact that the krypton-85 concentration in the troposphere has been increasing continuously, unlike the nuclides produced by bombs, which either disclose a correlation with bomb testing or, if they have passed through the stratosphere into the troposphere, show seasonal fluctuations[2].

The amount of krypton-85 present in the atmosphere at the end of 1962 corresponds to 65 metric tons of fissioned uranium-235; this is based on the assumption that the fission yield for krypton-85 is 0.3% (about 0.3% of U-235 atoms undergoing fission result in the production of krypton-85 atoms). If we compare this figure with the published data about reactors for civilian purposes, and the amount of U-235 which has undergone fission in them up to the end of 1961, we obtain at the most 10 metric tons. This is true even if it is assumed that these reactors have been operated continuously as full load and that the whole uranium has been processed, which is certainly not true. In this calculation the amount of uranium fissioned up to the end of 1961 was compared with the amount of krypton-85 present at the end of 1962, since a fuel element usually remains for one year in the reactor and then is stored for about three months for cooling down.

We have, therefore, a remainder of more than 40 metric tons of fissioned and processed uranium, which must obviously originate from reactors used for military purposes. These might be reactors in which plutonium and other products for the weapon industry are manufactured.

In view of these facts the following recommendations are suggested:

1. Setting up of a world-wide network of inert-gas sampling stations, to detect and control the sources of production of krypton-85.
2. Taking measures to limit the purely military use of uranium fission.
3. Development of methods for the storage of krypton-85 resulting from the use of nuclear energy for civilian purposes.
4. Initiation of research to determine the maximum permissible concentration of krypton-85.

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1 O. Griesser and A. Sittkus, Z. Naturforschung 16a, 620, 1961.

2 D. Ehhalt, K.O. Münnich, W. Roether, J. Schölch and W. Stich, Journal of Geophysical Research, 68 (13), 3817, 1963.

With respect to 3 and 4 it should be pointed out that the concentration of krypton-85 is at present 7 pc/m^3 of air. The concentration of radium emanation (radon) is about 200 pc/m^3 of air. Thus, an increase by a factor of 30 would make the concentration of krypton-85 equal to that of radon. This would result in an additional contribution to the radiation burden of lung tissues, and we lack at present definite information about its harmlessness or otherwise. In view of the rapid increase of the civilian use of nuclear energy, this thirty-fold rise in the concentration of krypton-85 may be expected to occur within a decade, if the present rate of development of nuclear energy is maintained. It would be then necessary to have at one's disposal practicable methods for the prevention of any further increase of the concentration of krypton-85, or else it must be shown beyond any doubt that such higher concentrations have no harmful consequences.

COMMENT ON PROFESSOR HAXEL'S PAPER

by Sir John Cockcroft

The International Commission on Radiological Protection has fixed the maximum permissible level of krypton-85 as 3×10^6 pc/m^3 for occupational workers. The basis of this is to limit the dose to the gonads to 5 rad/year.

A useful criterion would be to limit the genetic effects on the world population to about 1% of the natural background and that is about 1 mr/year. This would be produced by a krypton-85 concentration of about 600 pc/m^3. The present krypton-85 level could, therefore, be increased by a factor of about 100 before control measures became really necessary. This factor of 100 is not very different from the factor of 30 suggested by Professor Haxel. It will, however, be many years before the nuclear power development gives rise to such concentrations.

The krypton-85 can be removed from effluent at any time by appropriate chemical engineering methods. It is the responsibility of Ministries in individual countries to take action well before the maximum permissible level of civil operations is reached.

I do not think that Professor Haxel's comparison of krypton-85 with radon is biologically valid since the critical biological effect with radon is likely to be carcinoma of the bronchus. This is unlikely to happen in the case of krypton.

Professor F.A. Long*

THE UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY

This is a most appropriate time to summarize the organization and accomplishments of the U.S. Arms Control and Disarmament Agency (hereafter called ACDA), since the agency is celebrating its second birthday this month. When in the fall of 1961 a law was passed by both of the houses of the U.S. Congress establishing this Agency, the action was considered something of a political miracle. There had been strong support for the need of increased work in the field of disarmament, it is true. The problem had been to decide on the most appropriate mechanism. There were, for example, strong proponents of the idea that the proper place to do disarmament studies was in the State Department. However, the people who supported the idea of a permanent agency apparently presented the most persuasive case to Congress and ACDA became a reality.

Public Law 87-297 which established the Agency gave it the following primary functions:

1. to conduct and co-ordinate research for arms control and disarmament policy formation;
2. to prepare for and manage United States participation in international negotiations in the arms control and disarmament field;
3. to co-ordinate and disseminate public information about arms control and disarmament;
4. to prepare for and operate any control systems which may become part of the U.S. arms control and disarmament activities.

The Bill provided that the Agency was to have a director, a deputy director and up to four assistant directors, all to be appointed by the President with the advice and consent of the Senate. Roughly, the director was to have approximate rank of under-secretary, and the assistant directors were to have rank equivalent to assistant secretaries in the State Department.

The reporting responsibilities of the ACDA director are, under the Act, somewhat complicated. As a Presidential appointee he is clearly responsible to the President. However, the Act also states that in carrying out his duties the director shall have primary responsibility "under the direction of the Secretary of State". In a sense, this dual reporting responsibility is only a recognition of the political realities, since a Disarmament Agency most clearly cannot publicly proceed in directions which are either independent of, or in conflict with, State Department policies.

The current organization of ACDA involves four bureaus, each headed by one of the assistant directors. These are the bureaus of: International Relations; Economics; Weapons Evaluation and Control; Science and Technology. In addition to these principal divisions, the Agency has an Office of the General Counsel and a Disarmament Advisory Staff. The Agency itself is overseen by a general advisory committee appointed by the President. All this constitutes a fairly complex organization for what is still a rather small Agency. However, the very fact that the Agency is small has made it possible to operate efficiently in spite of the apparent complexity.

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

Perhaps the most significant authorization given to ACDA is to conduct research in the broad field of arms control and disarmament, and the enabling Act, in fact, spells out in considerable detail areas in which research may be conducted. This emphasis on the research function originated in the strong belief of the proponents of ACDA that the United States generally, and its disarmament negotiators in particular, needed much more intensive exposure to the prospects, possibilities and procedures for Arms Control and Disarmament and its interrelation with other components of U.S. foreign policy. In this view, the overall U.S. understanding of these problems could be improved and hence the capability and effectiveness of U.S. negotiators could also be improved if they were backed up by a sizable and continuing research programme in the area. Because of this basic proposition, and because of the consequent spelling out of the research function in the enabling Act, discussions of the research activities have played a large role in consideration of the Agency.

In spite of this emphasis on the need for long range research, ACDA actually became rapidly involved in the short range problems of disarmament negotiations. Following closely after the McCloy-Zorin agreement of September 1961, the U.N. called for, and eventually set up, an 18-Nation Disarmament Conference to be convened in Geneva in early 1962. Once this was finally agreed to, it followed that ACDA needed to act quickly to help develop U.S. policy and proposals for these negotiations. When the 18-Nation Conference convened in March 1962, the results of ACDA's winter's work were apparent. First, there was an able negotiating team headed by Ambassador Arthur Dean. Second, a U.S. Draft Treaty for General and Complete Disarmament was available for the Conference soon after it assembled. Third, there was a modestly revised U.S.-U.K. proposal for a comprehensive nuclear test-ban treaty, based essentially on the U.S.-U.K. draft treaty of spring 1961. ACDA's responsibility for conduct of the Geneva negotiations inevitably caused it to spend substantial amounts of time on the studies and analyses needed to support the negotiating team. Much the same thing can be said about the test-ban negotiations which occurred both at Geneva and New York, and which culminated in the agreement reached in Moscow in the summer of '63. The Bureau of Science and Technology was particularly active in studying the basic problems involved in a comprehensive ban on nuclear tests and in searching for new and technically satisfactory procedures for detection and verification.

In spite of these pressures on ACDA from its responsibilities to the U.S. negotiations, the Agency quickly managed to become involved in its research function. It soon appeared that this research was to be done in two somewhat different ways. In the first place, full time employees of the Agency became themselves involved in research ("study" would perhaps be a better word) into a wide range of topics in the general area of arms control and disarmament. The other mechanism used by ACDA to get its research done was to contract for it to both private and public agencies. The first contract for research with an outside agency was to the Bendix Corporation, and called for a study of techniques for monitoring the production of strategic nuclear delivery vehicles. This was soon followed by several similar research contracts.

It became clear that there are a number of outside U.S. groups, both public and private, who are interested and knowledgeable in disarmament problems and who are eager to work with ACDA.

The Agency was particularly interested in obtaining the participation and co-operation of university scholars. In order to encourage this, it soon announced the adoption of a Research Grants Programme. The object was to encourage scholars to apply to the Agency for grants to support studies which were of direct interest to the scholar but with long range applications to the problems of arms control and disarmament. This should be a productive and stimulating programme.

Nineteen-sixty-two, the first summer of the Agency's life, also saw an interesting experiment with a summer study on the broad problem of verification and control of disarmament agreements. The results of this study were published and made generally available in the fall of 1962 under the title "Verification and Response in Disarmament Agreements". This study constitutes a most significant contribution to our understanding of both the philosophy and the problems of verification and inspection of disarmament measures. It has contributed greatly to ACDA's own studies in this field.

As it celebrates its second birthday, ACDA can rightly consider itself an established and accepted U.S. government agency. It has a staff and an organization and its people are hard at work. It can point to a successful, completed negotiation, the limited test-ban. Its practical success both in the negotiation field and in its research programme has been substantial enough to justify the hopes of its supporters, and to lend substance to the belief that significant additional disarmament measures will be developed and proposed.

October, 1963

NOTE BY PROFESSOR B. T. FELD,

Chairman of the P-COSWA Committee of the American Academy of Arts and Sciences

The above report on the United States Arms Control and Disarmament Agency was prepared by Dr. Franklin A. Long at the request of the Committee on Pugwash Conferences on Science and World Affairs of the American Academy of Arts and Sciences. Dr. Long, a Professor of Chemistry at Cornell University, was until this past summer Assistant Director for Science and Technology of the Agency. In this capacity, Dr. Long helped to set the tone and direction of the Agency in its formative years. It is generally agreed that the Agency and its present enthusiasm and spirit owe a great debt to his devotion and zeal.

To Americans interested in the cause of disarmament, the creation of the Agency represented an important step forward. For although there have been individuals in various parts of our government actively interested in disarmament and arms control, we now have a single group with both the "vested interest" and the mandate to explore and pursue these goals in a continuous and concerted fashion. We hope that our Arms Control and Disarmament Agency may serve as both inspiration and, where appropriate, as prototype for similar expansions of official interest in disarmament in many other countries.

PUGWASH EVENTS

THE CONTINUING COMMITTEE

Meetings of the Continuing Committee were held in Dubrovnik on the 17, 18, 19, 24 and 25 September. Apart from the immediate problems relating to the organization of the Dubrovnik Conference, the Committee discussed future conferences, as well as a number of other problems.

Sir Nevill Mott is retiring from the Continuing Committee; he will be succeeded by Professor R. E. Peierls.

The Soviet Group recommended that Professor B. M. Vul should be an alternate to Professor V. M. Khvostov on the Continuing Committee.

12th PUGWASH CONFERENCE

UDAIPUR, 27 January-1February, 1964

The title of the Udaipur Conference will be the same as that at Dubrovnik, "Current Problems of Disarmament and World Security", but the programme will include problems relating to developing nations. It is envisaged that there will be four Working Groups on the following topics:

1. Organization for collective security
   - i. Global
   - ii. Regional
   - iii. Non-militarization of space
2. Implications for disarmament and world security of a wider dispersal of military power
3. Relation between the economic problems of developing nations and world security
4. Priorities for science and technology in developing nations

Topic 1. will include discussions on the specific proposals made at the Dubrovnik Conference.

About 60 participants are being invited, in most cases on the recommendations of the National Pugwash Groups. The participation will be made up roughly as follows: 9 each from U. S. A. and U. S. S. R.; 6 from India; 5 from U. K.; 3 each from China and France; 2 each from Ceylon, Japan and Pakistan; one each from Australia, Brazil, Burma, Canada, Czechoslovakia, East Germany, Greece, Hungary, Indonesia, Israel, Italy, Malaya, Mexico, Netherlands, Outer Mongolia, Poland, South Africa, Sweden, Uganda, U. A. R., West Germany, and Yugoslavia. Scientists from several other developing nations may be invited if vacancies occur.

The Conference is being organized by the Indian Pugwash Committee consisting of Dr. H. J. Bhabha, Professor D. S. Kothari, Professor P. C. Mahalanobis, Professor V. A. Sarabhai and Dr. S. H. Zaheer, with the co-operation of Professor M. G. K. Menon.

13th PUGWASH CONFERENCE

KARLOVY VARY, 5-11 September, 1964

The Committee accepted an invitation from the Czechoslovak Pugwash Group to hold the 13th Conference in Czechoslovakia. The Conference will be held in the Moskwa Hotel in Karlovy Vary (Karlsbad) from 5 to 11 September 1964. The title of the Conference will be "Disarmament and Peaceful Collaboration among Nations" and there will be 60-70 participants. The Conference will be sponsored by the Czechoslovak Academy of Sciences.

A decision about the programme and topics for Study Groups will be made by the Continuing Committee when it meets in Delhi prior to the Udaipur Conference.

UNESCO-PUGWASH STUDY GROUP

"Long-term consequences of disarmament on the development of science, and on the applications of science and technology for the benefit of the underdeveloped countries"

Arising from the discussions at the 10th Pugwash Conference, and the subsequent visit to UNESCO by the Secretary-General, the Director-General of UNESCO is planning to set up a Study Group under the above title. The Study Group will consist of a number of scientists selected in consultation between UNESCO and the Pugwash Continuing Committee. It is hoped that the Group will be able to make a preliminary report to the Udaipur Conference.

CONFERENCES ON RESEARCH ON INTERNATIONAL PEACE AND SECURITY

A Conference of social and other scientists concerned with peace research was held at Clarens, Switzerland, from 16 to 20 August, 1963, under the sponsorship of the American Friends Service Committee and the Friends Service Council (Quakers). The resolutions unanimously adopted by the Conference included the following:

(a) That a series of international conferences on research on International Peace and Security be instituted along the pattern of Pugwash Conferences, without constitution or stated procedures in the first instance, and managed by a Continuing Committee of nine members, one of whom would be the Secretary-General.

(b) That the main activity of the Continuing Committee be to convene international conferences of a scientific nature.

(c) That the first such international conference be held in the summer of 1964, in Clarens if possible, and the theme of this conference be "The Contribution of Social Sciences to the Establishment of Stable Peace", with the additional special objective of preparing for the 1965 International Cooperation Year sponsored by the United Nations.

(d) That the Continuing Committee, in addition to its primary function of convening conferences, consider other suggestions made at this Conference, including its detailed administrative arrangements and its status; the compilation of a list of existing research groups concerned with Peace Studies, their publications and special interests; the making of abstracts in collaboration with the Canadian Peace Research Institute; liaison with research workers in Peace Research groups; the establishment of a scientific association of persons concerned with Peace Research; the publication of a Year Book, Newsletters, or other means of communication; exploration of means of communication with decision-makers and the public; and other matters which the Continuing Committee might decide upon.

(e) That the Continuing Committee establish a close working relationship with the Continuing Committee of Pugwash, and that Pugwash be asked to appoint an observer to it, and to receive an observer from it, and to consider the possibility of joint and/or simultaneous conferences on matters of common interest.

Dr. John Burton from Australia, who is now at University College, London, was elected the Secretary-General of the new Organization. The other eight members of the Continuing Committee will be from Africa, Canada, Czechoslovakia, Netherlands, Norway, Poland, U.S.S.R. and U.S.A.

RAISING FUNDS FOR THE CENTRAL OFFICE

At its meeting in Dubrovnik the Continuing Committee discussed the vexing problem of providing adequate funds for the Central Office in London so as to enable it to function properly. The following recommendations were made:

(a) The contributions from the U.S.A. and U.S.S.R. National Groups should be increased to the equivalent of $8,000 per annum each.

(b) All participants of Pugwash should be asked to make a personal annual contribution of $25 (those who have paid their own expenses in attending a conference should have been deemed to have made such a contribution).

(c) An appeal should be made to the National Groups to make annual contributions of $500-1,000, unless they are already contributing more.

(d) That "Friends of Pugwash" Organizations be set up in various countries with membership fees of $15 or more, and that two-thirds of the income of these organizations be passed on to the Central Office.

(e) That there should be a subscription fee for the Newsletter and the Proceedings of the Conferences.

(f) That a popular book on Pugwash scientists be published which would include contributions from scientists from a number of countries.

(g) Each National Group should designate a person who would be responsible for approaching firms, rich individuals and foundations for contributions; and that a report of the results of these approaches be given at the Udaipur Conference.

Arising out of these recommendations, the Committee has decided that in order to cover the cost of production there will be a nominal charge for the Newsletter of 1/6d. (25 cents, or 20 kopeks) per issue. Non-participants of the Pugwash Conferences will be asked in future to make a contribution of $10 per copy of the Proceedings of the Conferences.

NOBEL PEACE PRIZE - PROFESSOR LINUS PAULING

The news of the award of the Nobel Peace Prize for 1962 to Professor Linus Pauling will have been received by Pugwash members with great satisfaction. In congratulating him on this well-deserved recognition of his relentless efforts in the cause of peace, we wish him many more years of fruitful work in his own field of science as well as in the field of international relations.

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HOW OTHERS SEE US

IS PUGWASH BECOMING STERILE?

The Dubrovnik Conference has provoked an exchange of views on Pugwash in the British weekly magazine, the "New Scientist". In the 3 October issue there was a leading article under the title "Advice from Dubrovnik", containing a summary of the press statement on the Dubrovnik Conference released by the Continuing Committee. In the next issue (10 October) Geminus, who writes a weekly column in the "New Scientist", made the following comments:

"By all accounts the Eleventh Pugwash Conference at Dubrovnik was a great success, in the sense that Russians and Americans were more willing to talk to each other than they have ever been. In these circumstances it is no criticism of Pugwash, but rather the opposite, to say that the statement issued afterwards was a mixed blessing - at the best. What seems to have happened is that Pugwash is the victim of its own success in stimulating interest in the problems of disarmament and peacekeeping.

With the best will in the world it is extremely difficult to hail any of the ideas in the final communique as an original contribution to the problem of knowing what should be done in disarmament. The notion that there should be forward inspection posts in Central Europe, for example, is by no means new. Even the diplomatists have heard of it. (It is irrelevant, I know, but in my opinion control posts are not likely to make an effective contribution to the stability of the world at large).

Much the same can be said of the somewhat unspecific plea for the creation of nuclear-free zones, disengagement in Europe, and the like. I know that it is significant that Russians have actually put their names to these proposals, and I know that the Russians concerned are most influential. But even this fact only reinforces what I consider to be the correct assessment of the present condition of Pugwash - that it has become much more valuable as an unofficial channel of communication between East and West than as a source of novel ideas on disarmament.

The reasons for this are interesting and important. In the last five years or so the serious study of military strategy and of disarmament - the other side of the same coin - has become widespread. Institutes and universities all over the world are turning their attention to it. Parkinsonism is rampant, to be sure, and too much money is chasing too few ideas, but the result is a spate of serious studies of the practicalities of disarmament. From being an occupation for amateurs, disarmament has become a matter for the professionals. This is one of the things that Pugwash set out to ensure. Since its meetings are attended mostly by amateurs, however, it is not surprising that its original contributions are less striking than they used to be.

What is to be done? The organization seems well aware of the need for more serious and continuous study of the problems, and that should yield tangible benefits in the long run. There is less certain promise that Pugwash will come, as I think it should, to regard its formal meetings more frankly as the enlightened talking shops they have become".

The Secretary-General replied to these comments in the following letter which was published in the issue of 17 October under the title "The Future of Pugwash":

"The critique of Pugwash by Geminus (10 October) is well taken. But one or two of his points call for comment. Geminus asserts that Pugwash is running out of original ideas on disarmament. A similar criticism was made recently in "The Guardian" by John Maddox who, by way of example, pointed out that even the famous "black box" project was not an original Pugwash idea. My old professor used to tell us, whenever we came up with a novel idea, that if we searched the literature carefully enough, we would probably find that someone else had already published it. Often, however, the importance of a new idea depends on where, when, and by whom it was suggested. If this may be true of science, it is certainly true of the political problems with which Pugwash is concerned. The "black box" scheme may have been put forward earlier but it was only when it was taken up at a Pugwash Conference, in a joint paper by eminent American and Soviet scientists, that it became an important issue which has helped to reduce significantly the gap between the

official proposals on a test-ban treaty. This exemplifies one valuable aspect of the Pugwash discussions.

Having said this in defence of rehashed ideas, I must hasten to add that, as a veteran Pugwashite, I failed to detect any sign of deterioration in the rate of production of novel ideas. By the very nature of the Pugwash Conferences, the public statements are hardly a fair measure of their achievements, although even in this respect the "press release" from the Dubrovnik Conference is much less platitudinous and contains more specific suggestions than many a statement from the previous Conferences. But it is in the unpublished informal discussions in the working groups, or at the even more informal talks at meals, or during a swim in the sea, that the new ideas emerge. In this respect the stimulating and fertilizing effect of East-West discussions was as evident at Dubrovnik as ever before. Some of the ideas were quite original; for example, the suggestion concerning on-site inspections, to allow a larger number than the agreed minimum, of say three inspections per year, but that a country demanding an extra inspection would have to deposit a large sum (say $100 million) which it would forfeit if the request for inspection turned out to be unjustified.

Geminus states correctly that disarmament problems are now being tackled in a professional way by many institutes all over the world and that Pugwash is attended mostly by amateurs. But he missed a vital point: all these institutes are either in the West or in the East, and the contributions they make, however valuable, lack the effectiveness which can only come from a direct confrontation and ironing out of the different points of view, as takes place at Pugwash Conferences. Until such institutes or study groups are established on a truly international basis (it is likely that one will materialise in the near future) the Pugwash amateurs will still have an important role to play. But even then there will be plenty left for Pugwash to do. We are faced with the problem of China, which is at least as difficult as the reaching of an understanding between Western and Soviet scientists was when "Pugwash" was conceived in 1955. Disarmament and World Security do not mean only working out of techniques for the effective elimination of nuclear weapons and their means of delivery; they involve all the other means of destruction, including those which are still to be invented; they involve a whole host of problems of security in a world dominated by the tremendous progress of science, problems which have hardly been touched.

Far from falling victim of its own success and becoming complacent and sterile, Pugwash is seething with new ideas and increasing its scope of activities. This is chiefly because of the acute realization that the success it has had so far is infinitesimal compared with the problems that still lie ahead. The original purpose of Pugwash, to make scientists all over the world conscious of their social responsibility and to induce them to take an active part in tackling the grave issues which have resulted from the progress in science and technology, is as urgent, as compelling, and as valid now as it was in 1955.

J. Rotblat

NATIONAL PUGWASH GROUPS

AMERICAN COMMITTEE ON PUGWASH CONFERENCES ON SCIENCE AND WORLD AFFAIRS (P-COSWA)

Until this year the participation of the U.S. scientists in Pugwash Conferences has been organized by the American members of the International Continuing Committee, i.e. Professors Harrison Brown, Bentley Glass and Eugene Rabinowitch. In this task they have been aided by the Committee on Public Responsibility of Scientists of the American Academy of Arts and Sciences, through its Subcommittees on International Conferences. These groups have raised funds for American participation in the Conferences held in Moscow in 1960 and in England in 1962. The American Academy, together with the National Academy of Science, sponsored the Stowe Conferences in 1961, which were largely supported by the Ford Foundation.

On 23 March, 1963, the Council of the American Academy of Arts and Sciences agreed to assume responsibility for the organization of future American participation in P-COSWA activities. This decision of the Academy to assume the role of the American sponsoring organization for P-COSWA, was undertaken at the request of the American members of the International Continuing Committee. To carry out this role, the Academy has appointed a Committee on P-COSWA to which it has delegated responsibility for organization of American participation in this unique channel of effective international communication. The membership of this Committee is as follows:

Chairman: Prof. B. T. Feld
Vice-Chairman: Prof. E. Rabinowitch
Members: Mrs. Ruth Adams, Prof. H. Brown, Prof. P. Doty, Prof. J. T. Edsall, Prof. B. Glass, Prof. A. Rich, Prof. C.H. Townes and Dr. A.M. Weinberg.

NEW PUGWASH GROUP IN THE GERMAN DEMOCRATIC REPUBLIC

On the basis of a decision taken by the Presidium of the German Academy of Sciences, Berlin, the General-Secretary of the Academy, Academician Günther Rienäcker invited a number of G.D.R. scientists to consider the setting up of a National Pugwash Group of the German Democratic Republic. The meeting took place on 19 September, 1963. Having heard and discussed a report on the history, character and future activities of the Pugwash Movement, the participants, desiring to promote the efforts of the Pugwash Movement to secure a peaceful world, agreed to set up a Pugwash Group and to give it their active support.

The Group consists of the following scientists: Academicians Günther Rienäcker (Chairman), Walter Friedrich, Walter Hertz, Jürgen Kuczynski, Max Steenbeck, Leo Stern and Karl-Friedrich Alexander; Professors Heinz Barwich, Hermann Budzislawski, Artur Lösche, and Heinz Pose; Dr. Georg Sitzlack and Dr. Peter Hess (Secretary).

The Pugwash Group adopted statutes and elected a working committee consisting of Academicians G. Rienäcker and M. Steenbeck, and Dr. P. Hess.

P E R I O D I C A L S

WHICH PUBLISH ARTICLES OF INTEREST TO PUGWASH

(This is a first list covering only some countries. It is incomplete; any additions or amendments will be gratefully received by the Editor)
Subscription rates where quoted are per annum.

Australia

Australian Outlook. Three times a year. 25/-. Australian Institute of International Affairs, 252 Swanston Street, Melbourne.

Canada

International Journal. Quarterly. 9/6. Canadian Institute of International Affairs, 230 Bloor Street, W. Toronto 5.

Our Generation Against Nuclear War Quarterly. $3.00. 911 St. James Street West, Montreal 3, Quebec.

France

Revue de defense nationale. Monthly. (in English, French and German). 38.50 fr. 5 Rue Auguste Conte, Paris 6.

Germany

Atomzeitalter. Monthly. 10 DM. Elbest 46, Frankfurt-an-Main.

Europa Archiv Straumberg-Lippe-Strasse 6, Bonn/Rhein.

Rundbrief der Vereningung Deutscher Wissenschaftler. Geesthacht/Elbe, Kronsberg 31.

India

Foreign Affairs Record. Monthly. India Council of World Affairs, Sapru House, Barakhamba Road, New Delhi.

India and World Affairs. Quarterly. 12/-. Hindustan Publications Ltd., 50 Lake Place, Calcutta.

Netherlands

De militaire spectator. Monthly. 22.50 H. Fl. Moorman's Periodieke Pers., N.W., Zwarteweg, 1.

Pakistan

Pakistan Horizon. Quarterly. Pakistan Institute of International Affairs, Karachi.

Switzerland

Interavia. World Review of Aviation and Astronautics. Monthly (in English). 52/6. 6 Colvaterie, Geneva, 11.

United Kingdom

Anglo-Russian News Bulletin. Monthly. The Anglo-Russian Parliamentary Committee, 6 Buckingham Street, Adelphi, London, W.C. 2.

China Quarterly. Quarterly. 20/-. Information Bulletin Ltd., 133 Oxford Street, London, W. 1.

Disarmament and Arms Control quarterly. 40/-. (for individual subscribers). Pergamon Press, Oxford.

International Affairs. Quarterly. 27/6. Royal Institute of International Affairs, Chatham House, London.

Journal of the Royal United Services Institute. Quarterly. 42/-. Whitehall, London, S.W. 1.

King-Hall Newsletter. Weekly. 20/-. 162 Buckingham Palace Road, London, S.W. 1.

Minerva. Quarterly. 20/-. Committee on Science and Freedom, 133-5 Oxford Street, London, W. 1.

New Scientist. Weekly. 60/-.
Harrison, Raison & Co., Cromwell House, Fulwood Place, High Holborn, London, W.C. 1.

New World. Monthly. 6/6.
United Nations Association, 25 Charles Street, London, W. 1.

Scientific World. Quarterly. 10/-.
World Federation of Scientific Workers, 40 Goodge Street, London, W.C. 1.

Soviet Studies. Quarterly. 42/-.
Basil Blackwell and Mott Ltd., 49 Broad Street, Oxford.

Survival. Bimonthly. 28/-.
Institute for Strategic Studies, 18 Adam Street, London, W.C. 2.

War and Peace. Quarterly. 16/-.
C.N.D., 2 Carthusian Street, London, E.C. 1.

World Today. Monthly. 30/-.
Royal Institute of International Affairs, Chatham House, London.

World Affairs. Bimonthly. 8/-.
Federal Union Ltd., 10 Wyndham Place, London, N.W. 1.

U.S.A.

Air Force and Space Digest. Monthly.
Mills Building, Washington 6, D.C.

Aviation Week and Space Technology
Weekly. $20.00. McGraw-Hill, 330 W. 42nd Street, N.Y. 36, New York.

Bulletin of Atomic Scientists. Monthly.
$6.00. Educational Foundation for Nuclear Science, 935 E. 60th Street, Chicago 37, Illinois.

Council for Correspondence. Monthly.
Emerson Hall, 324, Harvard University, Cambridge, 38, Mass.

Council for a Livable World
1346 Connecticut Avenue, Washington, D.C.

Daedalus. Quarterly. American Academy of Arts and Science, 280 Newton Street, Boston 46, Mass.

Foreign Affairs. Quarterly. $6.00
Committee on Foreign Relations, 58E 68 St., N.Y.21, New York.

Journal of Conflict Resolution. Quarterly.
$5.50. Centre for Research on conflict resolution, University of Michigan, Ann Arbor, Mich.

Journal of Arms Control. Quarterly.
$7.50. Institute for Arms Control and Peace Research, P.O. Box 1106, Ann Arbor, Michigan.

International Newsletter on Peace Research. Quarterly. 820E Washington Street, Ann Arbor, Michigan.

Missiles and Rockets. Monthly. $15.00.
American Aviation Publications, 1001 Vermont Avenue, Washington 5, D.C.

Nuclear Information. 10 times a year.
$5.00. Greater St. Louis Citizen's Committee for Nuclear Information, 6504 Delmar, St. Louis 30, Mo.

Scientific American. Monthly. $6.00.
415 Madison Avenue, New York 17, N.Y.

S.S.R.S. Newsletter. Monthly. (Free).
Society for Social Responsibility in Science, Gambier, Ohio.

War/Peace Report. Monthly. $5.00.
305 West 18th Street, N.Y., New York.

U.S.S.R.

International Affairs. Monthly.
(in Russian and in English). 14/-.
14 Gorohovsky Pevenlock, Moscow.

THE CONTINUING COMMITTEE

OF THE PUGWASH CONFERENCES ON SCIENCE

AND WORLD AFFAIRS

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