



Einladung

ZU EHREN  
DER TEILNEHMER AN DER PUGWASHKONFERENZ 1976  
IN MÜHLHAUSEN

Der Vorsitzende des Ministerrates  
der Deutschen Demokratischen Republik

Horst Sindermann

beehrt sich

**Dr. G. Weiss Szilard**

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zu einem COCKTAIL einzuladen.

Donnerstag, den 26. August 1976, 12.30 Uhr, in Mühlhausen,

Kulturhaus „Schwanenteich“.



**26th Pugwash Conference**  
**"Disarmament, Security and Development"**  
Mühlhausen, German Democratic Republic, 26-31 August 1976

Agenda

1. **Problems of limiting and reducing strategic nuclear armaments and other weapons of mass destruction:**
  - a) Current status of SALT and other negotiations on strategic nuclear arms.
  - b) Examination of validity and utility of the concept of nuclear deterrence.
  - c) Ways to obtain massive reductions in the numbers of nuclear weapons.
  - d) A ban on chemical weapons and other non-nuclear weapons of mass destruction, the validity of deterrence as applied to chemical weapons.
  
2. **Controlling the spread of nuclear armaments:**
  - a) The problem of nuclear non-proliferation and the spread of peaceful nuclear technology.
  - b) Comprehensive test ban.
  - c) The problem of peaceful nuclear explosions.
  - d) Security issues, e.g. nuclear-free zones.
  - e) Doctrines of use of nuclear weapons in conflicts.
  
3. **European security issues:**
  - a) Implementation of the agreements of the Conference on Security and Cooperation in Europe.
  - b) Progress of the Conference on Mutual Force Reductions.
  - c) The problems of all-European cooperation in economic, scientific and other fields.
  
4. **Development and security:**
  - a) Implications of the concept of security for developing countries: military and non-military aspects.
  - b) Conventional arms race and the growth of military budgets.
  - c) Inter-relationships between patterns of utilization of the financial resources of oil-producing countries and the arms race in the Middle East and elsewhere.
  - d) Non-military threats to the security of developing countries: e.g. use of food, oil and other natural resources, manipulation of natural phenomena, role of multi-national corporations, and other activities.
  - e) New directions for international cooperation for development, including code of behaviour for international scientific cooperation.



26th Pugwash Conference  
"Disarmament, Security and Development"  
Mühlhausen, German Democratic Republic, 26-31 August 1976

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27th Pugwash Conference  
Munich, Federal Republic of Germany, 24-29 August 1977

STATEMENT OF PRINCIPLES FOR THE PUGWASH MOVEMENT

Twenty years ago, in July 1957, a group of scientists from East and West met in the Canadian village of Pugwash, to discuss the threat to mankind produced by the advent of hydrogen bombs. This was the birth of the Pugwash Movement, conceived in the Manifesto issued in 1955 by Bertrand Russell, Albert Einstein and nine other eminent scientists, calling on scientists to assemble in order to appraise the new peril, and urging Governments to renounce wars and seek peaceful means for the settlement of disputes.

By now, through the annual Conferences, Symposia and Workshops, over a thousand natural and social scientists have participated as individuals, in the world-wide Pugwash Movement. The characteristic feature of Pugwash discussions - open-minded and free exchanges among scientists from all parts of the world, irrespective of ideology or political commitment - very soon resulted in a broad consensus on the main issues and fundamental facts of the world situation.

There has been some progress during the last two decades toward international acceptance of measures to control the growth and spread of nuclear armaments: the partial Test Ban Treaty of 1963; the Nuclear Non-Proliferation Treaty of 1968; the Conventions banning the emplacement of nuclear weapons in space (1967) and on the sea beds (1971), the Treaty on Anti-Ballistic Missile Systems (1972), and other arrangements arrived at in the Strategic Arms Limitation Talks. These measures of nuclear arms control have helped to decrease tensions, to lessen the danger of nuclear war and to strengthen the atmosphere of détente among nations. The Final Act of the Helsinki Conference on European Security and Cooperation (1975) has opened the prospect that Europe will never again be the epicentre of a world-wide conflagration. The Convention Banning the Development, Manufacture and Stockpiling of Biological Weapons (1972) stands as an example of the possibility of agreement to eliminate weapons of mass destruction. In these achievements Pugwash played an active role.

But these steps are far from enough to remove from the world the desperate danger of nuclear annihilation. The arms races continue, and even intensify, both in nuclear and in so-called conventional weapons. Smouldering regional conflicts may erupt at any moment to engulf the globe. Our goal of comprehensive disarmament seems ever further away as governments continue to rely on military force in seeking solutions to their differences.

In the past twenty years science and technology have made new strides which, if properly applied, could have contributed



enormously to providing the basic requirements of food, clothing, health and housing for all, and to increasing both material and spiritual well-being. Instead, vast scientific efforts and technological resources are diverted toward destructive applications, involving tremendous human and material wastes. Nuclear arsenals grow with ever increasing sophistication of weapons and means of delivery. More and more nations are acquiring the capability of making nuclear weapons. New forms of mass killing are being invented all the time. Vitally needed resources are squandered by all nations in the accumulation of armaments of greater and greater lethality. With each passing day, the earth is an ever more endangered planet.

In these circumstances, the goals to which Pugwash efforts have been directed in the past should continue to command our unwavering support.

The main preoccupation of Pugwash remains with problems of disarmament and related issues of international security. High priority should continue to be devoted to the relationship of scientific and technological cooperation among all nations to world peace; in other words to the links between peace, disarmament and development.

There must be a renewal of efforts to stop the arms race, to reduce and, indeed, to eliminate all nuclear weapons, rather than just to control their proliferation. New weapons and means of warfare, based on new technological advances, must be nipped in the bud. Towards these ends, advantage must be taken of every opportunity to remove the root-causes of distrust, conflict and war, to increase the awareness of common interests among nations, and to advance the causes of disarmament and peace.

One great advance of the last twenty years has been the replacement of the "cold war", between the nations of the east and the west, by a recognition of the necessity for peaceful coexistence and cooperation, known as détente. Détente should be made irreversible and, by incorporating into the fabric of international relations, extended to all regions of the world. An alternative must be found to reliance on nuclear deterrence, based on the concept of assured mutual destruction, as the means of preserving peace. Insidious new doctrines of "partial", "limited" or "acceptable" nuclear war must be decisively rejected, and replaced by positive measures for promoting cooperation and peace through international order. Means must be devised for bringing an end to the world-wide expansion and competition in military research and development, which continues to fuel the arms race and to frustrate our attempts at arms control. Scientists have a special responsibility for this aspect of the arms race.

We must also continue to work towards removing the forces responsible for the great and growing disparities between the highly industrialized and the developing countries. Starvation and misery remain the norm for a very large part of the world's population. The resources of the world are being wasted with little



regard either for present inequities or future needs. This grim situation is incompatible with the achievement of a just and humane world order, and endangers world peace.

Pugwash welcomes the increasing involvement of third-world scientists in all aspects of its work. Already they have been instrumental in the development of a Code of Conduct on Transfer of Technology. Scientists from all nations must continue, together, to explore the contributions that science and technology can make to the establishment of an equitable economic, social and political world order. Towards this end, we need to investigate such questions as ways of increasing the commitment by richer nations to accelerate the independent, self-reliant development of the poorer; reduction of pressure to increase the level of armaments in the third world; elimination of military and non-military threats to the independence and security of developing nations; adoption of measures to assure the responsible and equitable distribution of world resources; elimination of hunger from the face of earth; effective means for fostering the scientific and technological capability of the underdeveloped world.

Progress on development issues and in the reconstruction of international economic relations on a just and democratic basis will help to strengthen détente and solve problems of disarmament. Equally, the amelioration of the international climate and improvement of international security will allow states to use for development purposes a growing part of the vast resources now squandered on arms and the military. Thus the Pugwash themes of disarmament and development are linked as essential of the larger effort for a world at peace.

International cooperation between scientists and technologists is an increasingly important factor in solving the world's problems. Therefore, we take this occasion once again to call on the men and women of scientific community to be actively engaged in safeguarding the future of mankind, which is still in danger.

On entering into the third decade of Pugwash, the summons of the Einstein-Russell Manifesto retains its original urgency. "We must learn to think in a new way", they said, when they first called us together. "We are speaking on this occasion, not as members of this or that nation, continent or creed, but as human beings, members of the species Man, whose continued existence is in doubt ...".

While we are confident that it is possible to build a world without war, with all nations sharing in the riches of the earth and the assets of the human mind, we realize that this will not be achieved without a tremendous, dedicated, united and sustained effort of men and women of different origins, ideologies and political views.

In the end, humankind can only be saved by human actions. We all bear responsibility for the preservation of the civilization of which we are the human heritors, and its improvement for those who will come after us. As scientists we share heavily in this responsibility. Science must be used only for the benefit of humankind - never for its destruction.



## DECLARATION

BY THE PUGWASH COUNCIL

ISSUED AT THE CONCLUSION OF THE 27TH PUGWASH CONFERENCE

MUNICH, 24-29 AUGUST 1977

In the light of discussions at the 27th Pugwash Conference on Science and World Affairs, the Council of the Pugwash Movement feels impelled to issue the following declaration:

The world is poised for a new, more intensive and more dangerous round of the arms race.

Three features of the world scene account for our sense of heightened urgency and danger:

1. New weapons of mass destruction

The neutron bomb is proposed for deployment in the heart of Europe. It is sometimes called a "clean" or damage-free bomb. On the contrary, both its lethal radiation effects and the short- and long-term biological damage it would cause are substantially greater than for existing nuclear weapons of comparable size. There would be strong induced radioactivity from neutron capture in the soil. Because of its relatively small <sup>yield</sup> size, it would narrow the distinction between conventional and nuclear weapons and thereby make the use of nuclear weapons more likely.

But the neutron bomb is only one example of new types of weapons now coming into military arsenals: cruise missiles, mobile ballistic missiles, and others. These are often provocative and thus destabilizing. Their deployment is not verifiable with national means, and thus frustrate efforts at control. And the number of nuclear warheads continues to mount.

The deployment of all these new weapons must be stopped.

2. Proliferation

There was a serious concern in the Conference over reports of an imminent nuclear weapon test in South Africa. This concern was not allayed by the assurances by the South African Government that it has no intention to do so. The acquisition of nuclear weapons by South Africa would be a grave peril to the peoples of Southern Africa and the rest of the world. Developments there must be kept under intense continuing surveillance. Any collaboration with South Africa in the nuclear weapon field - whether on the govern-



mental, commercial or scientific level - must stop.

The United Nations should be urged to apply effective sanctions should South Africa be proven to be developing nuclear weapons.

But South Africa represents only the most urgent and immediate occasion for concern. At various points around the globe there have, from time to time, been disturbing reports of states seeking nuclear weapons. We unequivocally condemn moves towards further nuclear weapon proliferation.

### 3. The failure of arms control

Despite endless efforts, progress towards limiting armaments and stopping the arms race has been all but invisible. Everywhere there is a new sense of impasse. And this is particularly ominous in the SALT and ~~MBFR~~ negotiations.

There is no military reason for their failure to make progress. No nation's security would be endangered - indeed it would be enhanced - by much lower levels of armament. The obstacles are political and it requires only political will and political decisions to overcome them.

WE CALL ON THE HEADS OF CONCERNED GOVERNMENTS AND STATES, ALL OVER THE WORLD - particularly of the USA and USSR - to halt new weapons deployment and reverse the arms race.

WE CALL ON MEN AND WOMEN EVERYWHERE to redouble their efforts to make their governments understand and act in the face of our common peril.

And we in Pugwash rededicate ourselves to the achievement of a world at peace.



STATEMENT FROM THE COUNCIL OF THE PUGWASH CONFERENCES ON SCIENCE  
AND WORLD AFFAIRS ON THE 27TH PUGWASH CONFERENCE

Munich, Federal Republic of Germany, 24 - 29 August 1977

"Peace and Security in a Changing World"

Preamble

Twenty years ago, in the village of Pugwash, in the Canadian province of Nova Scotia, there assembled a small group of 22 scientists. They came from 10 countries -- from the United States and the Soviet Union, from Japan and Great Britain, from Poland and France, from China and Canada, from Austria and Australia -- in response to an appeal by Bertrand Russell and Albert Einstein. They came to "appraise the perils that have arisen as a result of the development of weapons of mass destruction ... (to) ... urge the Governments of the world to realize and acknowledge publicly, that their purpose cannot be furthered by a world war and ... to find peaceful means for the settlement of all matters of dispute between them."

Twenty years later, we meet in Munich, in the Federal Republic of Germany. Our ranks have grown -- we were 223 participants from 47 countries plus 15 observers from international organizations -- but the urgency is undiminished. The situation has changed greatly in the past twenty years, as has the international atmosphere, but the problems, of ridding the world of the nuclear menace and of the spectre of hunger and want, are with us still.

Our Conference had the responsibility of reviewing the Pugwash charter -- the principles under which we work, our organization, and modalities of operation -- and of electing a new Council and officers. The new Council consists of 23 members from all the regions of the globe; their names are appended to this document.

The Conference re-elected as its President, Professor Dorothy Hodgkin of Oxford University. Professor Hodgkin, a Nobel Laureate in Chemistry and distinguished crystallographer, has been Pugwash President for the past two years. Re-elected as Director-General,



the chief executive officer of Pugwash, is Dr Martin M. Kaplan of Geneva, a world-renowned epidemiologist and microbiologist and recently-retired Director of Medical Research of the World Health Organization. The new Pugwash Council re-elected as its Chairman, Professor Maciej Nalecz, Director of the Institute of Biocybernetics and Biomedical Engineering of the Polish Academy of Science. Professor B. T. Feld, Professor of Physics at the Massachusetts Institute of Technology and former Secretary-General of Pugwash, was elected Chairman of the Executive Committee of the Council.

The Conference participants divided into eight Working Groups, under the following headings:

- |                 |   |   |
|-----------------|---|---|
| Working Group 1 | : | Nuclear Arms Control and Disarmament                              |
| 2               | : | Arms Control and Disarmament in the Non-Nuclear Realm             |
| 3               | : | Co-existence, Détente and Cooperation between Nations and Systems |
| 4               | : | Security of Developing Nations                                    |
| 5               | : | Development Problems of the Economically Poor Nations             |
| 6               | : | Energy, World Resources and Population Trends                     |
| 7               | : | Environmental Hazards of Global Concern                           |
| 8               | : | Science, Scientists and Society                                   |

There follows a summary of the main conclusions of the Working Groups, prepared by the outgoing Pugwash Council.

#### 1. Nuclear Arms Control and Disarmament

The continuing arms race poses increasing threats to peace and security and the only hope humanity can have is that this race is stopped and reversed. There is urgent need to start on real disarmament.

It is our judgment, that SALT is not progressing fast enough to prevent advances in military technology which threaten to negate the effect of agreements based on SALT.

A problem of highest importance is the prevention of development and deployment of technically advanced weapon systems of mass destruction with provocative or non-verifiable characteristics, since these are most likely to destabilize the present state of strategic balance.



But agreements only on specific weapon systems are inadequate to stop the arms race, because technological innovation runs ahead of negotiation. Measures are needed which embrace the development of all new weapons, particularly those of mass destruction. Among specific disarmament measures which were suggested were the comprehensive nuclear test ban, a fissile materials cut-off for weapons production, and substantial reductions of existing armaments.

We have had extensive discussion dealing with nuclear proliferation and related problems. It was contended by some that the NPT is unbalanced and that non-nuclear weapons states are discriminated against because (i) the nuclear weapons states have failed to carry out their commitment to commence disarmament, (ii) they have not provided non-weapons states with all aspects of peaceful nuclear technology assured by the treaty, and (iii) there are inadequate security assurances to non-nuclear weapons states. Another view was that the NPT, in doing its assigned task, could not have been expected to prevent proliferation but only to delay it, and that this is of great value.

The Comprehensive Nuclear Test Ban (CTB) is of major potential value in delaying proliferation. Two problems are in the way of a speedy agreement. One is whether all nuclear weapon powers will be willing to adhere to a CTB treaty; the other is the issue of peaceful nuclear explosions.

A detailed discussion took place regarding the so-called neutron bomb. This bomb involves sophisticated technology, being an elaboration, modification and miniaturization of the H-bombs. Its main effectiveness is by the action of fast neutrons. The neutron bomb would also generate strong induced radioactivity by neutron capture in the soil. This and the long-lasting somatic and genetic effects of neutron radiation cast grave doubts on the assertions of its proponents that its use would minimize harm to non-combatants.

Particular objection to this weapon lies in the emphasis which it would place on fighting war rather than preserving peace. It will have a number of further adverse effects on disarmament prospects including:

- endangering the realization of a comprehensive test-ban treaty;
- narrowing the distinction between conventional and nuclear weapons;



- lowering the threshold for the use of a nuclear weapon and increasing thereby the threat of general nuclear war;
- increasing the pressures for nuclear proliferation.

There was substantial and favourable discussion of Nuclear Free Zones, especially the proposal to have a limited one in Central Europe, for instance between the Rhine and the Vistula. It was considered however that to be effective such Zones must be coupled with a commitment of the nuclear powers not to use nuclear weapons there.

The concept of strategic nuclear deterrence came under extensive criticism. Over the years the nuclear arsenals have grown manifold and yet are still claimed to be indispensable for security. It was repeatedly emphasized that adequate deterrence can be had at much lower levels of arms than the present, and it was also noted that political factors - mistrust about the intentions of the other parties - are the real hindrance to the reduction of the strategic arsenals.

## 2. Arms Control and Disarmament in the Non-Nuclear Realm

The twentieth anniversary of the Pugwash Movement comes at a time when preparations are being made for the Special Session of the UN General Assembly on Disarmament. This provides a unique opportunity to consider whether there should now be radically new approaches to disarmament.

The Special Session of the UN General Assembly should assert the responsibility of that body for the setting of targets - a kind of Disarmament Development Plan - and for the coordination of disarmament negotiations generally which would create a wider feeling of international involvement.

In preparation for the work of their representatives at the Special Session, the forthcoming UN General Assembly should call on all governments to establish national study groups of scientists, scholars, and non-governmental organizations to consider and initiate new proposals for disarmament.

Pugwash will do all it can to ensure that the Special Session focus on concrete steps for the achievement of GCD on the basis of a predetermined time scale.



The nuclear arms race has a direct connection with the conventional arms situation in different parts of the world. New developments in it tend to give a kind of legitimacy to the build-up of conventional arms.

At the same time, we wish to draw attention to the problems raised by recent qualitative changes in conventional weapons. In particular, the destructive potential of area weapons is now increasing so rapidly that the clarity of the distinction between nuclear and non-nuclear weapons is being threatened from below as well as from above by, for example, the neutron bomb.

A prime task of the Special Session of the UN should be to initiate investigation of the means of controlling military research and development.

We note that during the past few months there have been signs of renewed activity towards an international agreement on a convention to abolish Chemical Warfare (CW). In particular, the USA and the USSR have at last begun substantive bilateral discussions on the joint initiative promised in the July 1974 Moscow Communiqué.

A suggestion was put forward on the possible usefulness of a system of negotiating mutual on-site observation only between concerned parties, within the framework of a consultative committee of a CW Convention. Such a system might reconcile opposing views and find application in other disarmament conventions.

The failure to date of the Vienna talks invites a reappraisal of the approach to force reductions. The focus should be on the scale of reductions and the procedures to be adopted to achieve such reductions in such a way as to dovetail with a general programme of disarmament. A first step might be to limit armaments to their present level. Connections between the mutual force reduction (MFR) talks, as well as SALT, and the main stream of UN disarmament discussions should be established, including reports on progress to the General Assembly.

One way of breaking an impasse in disarmament negotiations may be by unilateral initiatives. Steps to disengage, to reduce forces, or to defer the introduction of new weapons systems, with cumulative results to follow a favourable reaction, would deserve international encouragement. By such means a breakthrough leading to a measure of genuine disarmament might be achieved.



Alleged adverse economic effects have been an obstacle to disarmament. A new UN report on the economic and social consequences of the arms race confirms the view that the problem of employment has often been exaggerated in the public discussion. Disarmament need not lead to any overall decline in employment, or to other economic problems: drastic reductions in military expenditure are indeed likely to diminish inflationary pressures in several ways. The Special Session should give particular attention to the ways in which disarmament and development are in fact related, and to ways of ensuring the transfer of substantial resources from armament programmes to development purposes.

Important initiatives to limit military budgets and arsenals could be taken at the regional level by the states in some areas: the Special Session of the UN should consider means of fostering such initiatives including regional disengagements by major powers.

In conclusion we reiterate the importance of the opportunity provided by the Special Session of the UN General Assembly for considering new procedures for disarmament negotiation and establishing a disarmament programme with clear objectives and the institutional means of making it effective.

### 3. Co-existence, Détente and Cooperation between Nations and Systems

Considering various aspects of détente, we stress the importance of interrelations between this process in certain areas, particularly in Europe, and political trends in other parts of the world. The famous thesis about the indivisibility of peace has now acquired still more strength in the sense that détente is beneficial to all people of the globe irrespective of their social and political systems, and all governments should be urged to promote it. The building of worldwide détente is not only highly desirable but may become, despite tremendous obstacles, possible and real.

Attention needs to be given to ways and means of making détente a continuing and hopefully irreversible process, leading to a system of permanent friendly cooperation of states despite differences in their social, political, and economic systems or levels of development. Détente is precarious if there is an intensified arms race when, figuratively speaking, mankind has to live on a powder keg.



An adequate military détente as a counterpart to political détente is necessary, as well as a new way of thinking in order to overcome tensions.

Détente involves not simply broad statements of friendship but rather a comprehensive practice of dealing with problems on their respective merits. In general, disagreement on one issue should not be allowed to impede cooperation on others.

The Helsinki Agreements are a product of détente and the starting point for new developments. Each of the four so-called 'baskets' of the Helsinki Agreement should be recognized as having great significance.

Some of us underlined the importance of the principles of Helsinki by pointing out that they had been incorporated in the draft on the new constitution of the Soviet Union. Others laid stress on more general achievements. Both scientific and cultural cooperation have grown. On the other hand, it was noted that some asymmetries exist in the mutual exchange of such things as books and films. There had been steady progress in economic collaboration, despite some setbacks arising from the prevailing economic climate. Mention was made of confidence-building measures in the military field and of cooperation in the environment and other spheres.

It had to be admitted that unfortunately there were also some negative features. For example, lack of progress in MFR increasingly creates an unfavourable climate.

A good deal of time was spent discussing the issue of human rights. Some questioned whether this could properly be considered in isolation from other aspects of the Helsinki Agreements; and there were those who pointed out that states have approached the Agreements from different starting points.

The view was expressed that nations which had not yet ratified the International Covenants on Human Rights (see Principles VII of the Helsinki Agreement) should do so. It was agreed that, for scientists in particular, the way forward was to press for the free circulation of ideas, the dissemination of scientific information, adequate rights of publication and travel to scientific conferences and to scientific laboratories. Similar measures should also, of course, be sought by non-scientific groups; and, as was



stressed by some participants, be carried out with due consideration of the historical traditions, established national standards of behaviour, and laws existing in various states. In a detailed discussion on some aspects of these and other human rights, some claimed that a number of violations had occurred and detailed and controversial examples were cited, e.g. serious violations of human rights by security forces and medical personnel in various parts of the world.

Some of us emphasized their over-riding moral commitment to combatting violations of human rights everywhere. Others expressed the view that the human rights issue should not, however, be used for propaganda purposes, or in an attempt to destabilize governments.

It was recognized that increased cooperation should take account of and build on what has gone before. Much effective cooperation has taken place not only in the physical sciences but also in the social sciences where it is often more difficult. It was pointed out that the Final Act of the Helsinki Conference provided a comprehensive and detailed list of desirable measures of international cooperation.

In addition, we were able to devote some time to the problems raised by terrorism and to consider some psychological and behavioural aspects of conflict and cooperation. Some tended to stick to rather broad definitions of terrorism, associating it with acts of violence and crime in general, and attributing its spread to the crisis of industrial civilization. There seemed to be little chance of any wide multilateral agreements to cope with terrorism defined so loosely. Others, however, sought more narrow and precise definitions. In this connection, the problem of hijacking was singled out, with suggestions that a wider international legal basis be sought for combatting the problem, as well as those concerning such practices as kidnapping and the taking of hostages. The problem of international terrorism pursued by governments was also touched upon.

Special concern was expressed in view of the gloomy prospect that certain terrorist groups might obtain nuclear weapons, or other weapons of mass destruction, and use them to blackmail governments.

It is urgent to evolve more sophisticated and effective methods of enquiry in the behavioural and social sciences in order to illuminate causes of contemporary international conflicts and ways of reducing anxieties which could lead to a catastrophe. The bringing together of the natural and social sciences, it is hoped,



could provide the basis for a new scientific humanism.

#### 4. Security of Developing Nations

The security of the developing nations must be seen in the light of experience in the last thirty years. During this period more than 150 armed conflicts of various dimensions have taken place in the developing countries. Historical factors, both internal social structures and external forces of colonialism, inevitably have led to a condition of insecurity.

Reports of preparations by the South African regime to test a nuclear device require continuing investigation despite assurances to the contrary reported to have been given by the apartheid regime. Available information points to the imminent acquisition of nuclear weapons capability by South Africa. So grave is the peril of this development for the peace and security of the peoples of Southern Africa and the world that it is necessary to manifest our profound concern (as we did by sending a telegram in May 1974 to Prime Minister Indira Gandhi of India on the occasion of the explosion of a nuclear device) and to urge all countries at present collaborating with South Africa in the military nuclear field to cease such cooperation, whether on the governmental, scientific or commercial planes. Moreover, the United Nations should be urged to apply effective sanctions should South Africa be proven to be developing nuclear weapons.

We also expressed grave concern over persistent reports (which we earnestly hope have no foundation in fact), of acquisition of nuclear weapons by Israel, which could trigger a nuclear race in the strife-torn region of the Middle East and enhance the danger to peace in this area. Already there are reports about other countries in this area attempting to acquire an atomic weapon potential. It is necessary to further study reports of sensitive activities in Zaire by a corporation of the Federal Republic of Germany, activities which could possibly entail consequences for the security and well-being of African peoples. These reports, as well as reports on other cases of this kind, need to be investigated, and our influence exercised towards halting the dangerous aspects of such activities. Similarly, investigation is necessary of reports on collaboration between South Africa and Israel, France, the FRG and the USA in the nuclear field and appropriate action should be taken by scientists in these



and other relevant countries to preclude such collaboration.

We endorse the concept of the demilitarization of the Indian Ocean so that it can be turned into a zone of peace. But it must be added that the littoral states should make their own positive contribution to the establishment of this zone of peace. This means the elimination of foreign military bases and the firm resolution that no nuclear weapons shall be tolerated. Similar zones of peace should also be established in the South Western Pacific and other areas.

The use of nuclear power for development within the next decades might be unavoidable in many developing countries, and therefore the expansion of this source of power should not be hindered by restrictions unilaterally applied by supplier states. At the same time steps should be taken to ensure that the use of such energy should not be diverted to military purposes.

Repeated reference was made to the frequency of wars in the developing world. Besides the enormous loss of life, the urgently needed resources for development are diverted to destructive purposes. In addition, Third World countries are becoming ever more dependent on the suppliers of sophisticated weaponry, be they foreign powers or foreign corporations. The interference of these outside forces in the daily life of the Third World nations has sometimes made the notion of national sovereignty a mere mockery.

The Non-Aligned countries have an important role to play in the preservation of peace in the Third World. Hope must be also expressed that they will make their weight felt increasingly through the instruments of genuine regional organizations like the OAU. Moreover, the activities of these organizations should be closely coordinated with those of the United Nations, which still offers the only possible vehicle of assuring the security of the developing countries.

The most urgent task which all of the developing countries are confronted with is the creation of a viable economy, i.e. an economy which can maintain itself largely by its own efforts. This goal may be summed up in the short phrase of "creating a system of self-reliance". Policies to this end are rendered difficult, in some instances even impossible, by internal and external forces, which are often interlocked.



Some multinational corporations (MNC's) are major instruments of economic, social and political domination of the developing countries by the industrialized countries, and these activities contribute significantly to undermining the security of developing countries. Of particular importance is the fact that their transnational structure enables MNC's to sometimes act independently of their respective governments and/or to influence governmental decisions in ways not always conducive to world peace.

We cannot afford any longer to overlook the crucial aspects of security in the Third World. We have a moral obligation to call upon all outside powers - be they countries, international organizations or large private corporations - to abstain from imposing their political and social "solutions" upon the nations of the Third World, and to desist from engaging in proxy wars at the expense of these nations. The developing countries, both in their own interest and in the interest of world peace, should resolve their outstanding disputes by resort to peaceful means.



5. Development Problems of the Economically Poor Nations

The problems arising from poverty are a major threat to world peace, while the curtailment of spending on armaments is one of the prerequisites for development.

Development requires a global approach, since it is conditioned by the traditional international economic order, which is at present a major obstacle to the welfare of large parts of humanity.

The satisfaction of basic human needs of the whole population on the developing world is the most urgent task confronting the international community. The achievement of this goal calls for a new international economic order and a spirit of cooperation, both of which must aim at liberating the people of the LDCs from economic and cultural, external and internal, domination.

We take it as self-evident that the old concept of aid should be replaced by that of international cooperation, preferably in a multilateral rather than a bilateral manner. International cooperation should encourage social change in the direction of equity and justice, and should foster the advancement of knowledge and mutual understanding.

International cooperation presupposes a capacity to cooperate. In the instance of developing countries this capacity is conditioned by institutional and material constraints. Last but not least the cooperation among developing countries should be greatly strengthened.

Some of us have stressed that a strategy of dissociation from the prevailing asymmetrical structure of the present international economic system should be implemented. This should not mean autarky but rather a break with primarily export-oriented economies and with a development process which takes contemporary metropolitan countries as models. Specific activities to be undertaken in the application of the strategy of dissociation were also identified.

The development of balanced infrastructure related to health, population planning, education, science and technology, etc., is essential, and due attention ought to be paid to socio-cultural values.

We urge that women and men be treated equally in the process of developing scientific and technological manpower.

We have also received information about the objectives and the general characteristics of the 1979 UN Conference on the Application of Science and Technology through its Secretary-General.

There was consensus on the validity of the objectives that have been set for the Conference. However, concern was expressed



that the preparation carried out so far at various levels within and outside the UN system were still inadequate. Unless an active participation of the scientific community is ensured at the national, regional, and international levels, the preparation of the Conference is not likely to lead to useful results. A close complementarity between the governmental and non-governmental efforts was urged.

The following two aspects relevant to the agenda of the Conference need to be considered further:

(a) The application of science and technology for development;

(b) The socio-economic implications of new and future scientific and technological activities.

#### 6. Energy, World Resources, and Population Trends

The energy problem cannot be entirely separated from the other dimensions of the human predicament, including: food, the most urgent resource problem, which will require the application of increasing amounts of energy for its solution; water, needed to produce both energy and food, yet in many regions the scarcest resource; population growth, which must be slowed to provide even a chance of solving the energy problem or any of the others; and finally armaments and armed conflict, which divert huge amounts of energy, money, and talent from real human needs. Still, these interconnections, notwithstanding, the role of energy is pervasive and fundamental, and we elected to concentrate on energy, and how to manage it for the betterment of the human condition.

The essence of the energy problem is not exhaustion of energy resources as a whole, but rather the conflict between the apparent economic imperative for energy growth and the rising costs of such growth - costs that are environmental and political as well as economic - which increasingly dictate that the growth of energy use must be slowed down. The resolution of this dilemma must be two-fold. First, future growth of energy must be distributed in such a way that most of it takes place in the developing countries, where the needs are most desperate, while further increases in prosperity in industrial nations should depend more on increases in the efficiency with which energy is used than on increases in how much is used. Second, the mix of energy sources relied upon must evolve in the direction of minimizing not merely the economic cost per unit



of energy supplied, but rather the sum of economic, social and environmental costs.

Most of us believe that the last criterion means we should try to minimize the extent and duration of civilisation's dependence on nuclear fission as an energy source, particularly avoiding if possible any large-scale application of breeder reactors. We take this position, despite the potential of the breeder to provide a nuclear source of energy for centuries, not decades, because of the essentially unique and currently unresolved problems of safeguarding this technology. It would provide nations with authorized direct access to plutonium, a nuclear explosive material, and thus gravely endanger the capabilities of the non-proliferation regimes to prevent the spread of nuclear weapons. Present circumstances dictate, however, that some continued use of fission in some regions of the world is inevitable, which means that high priority must be given to managing this technology in a way that minimizes the likelihood of its misuse for the production of nuclear weapons. We are all agreed that, at the same time, research and development on solar and other non-fission alternatives should be greatly stepped up, to resolve present uncertainties about how much energy they could supply and how quickly they could be deployed.

From these general considerations the following specific proposals emerged:

a) A new high priority on sustainable energy sources - particularly direct and indirect harnessing of solar energy - should be implemented by the establishment of new research centres and funding agencies at the national and international levels, with participation by scientists from developing countries.

b) Research should be greatly expanded on increasing the efficiency of energy use in industrialized and developing nations alike - i.e. learning to extract more human welfare from each unit of energy. Emphasis is need not only on the technologies of energy conservation, but also on overcoming social and institutional barriers to its implementation.

c) We are united in our commitment to the use of forms of energy which are unlikely to be abused for destructive purposes. In the judgement of a few, the plutonium breeder in this respect poses no novel dangers. Most of us, however, are uneasy about the



proliferation and diversion risks attendant on large-scale application of breeder reactors. Of these, a few believe that because the large-scale application of breeder reactors is in any case many decades away, efforts to strengthen political and technical safeguards should proceed in parallel with the development effort and should not delay it. The majority believes, however, that the push toward large-scale deployment of breeders can and should be postponed. In connection with the strategy of delay, we recommend establishment of an international fuel authority, which by means of a fuel stockpile could assure a continuing supply of fuel to consumer states foregoing reprocessing. Other ingredients of the strategy include international participation in enrichment facilities, and provision of storage facilities for spent fuel under the auspices of the international fuel authority. The time gained by delay would be used to investigate uranium-saving fuel cycles more proliferation-resistant than that of the liquid metal fast breeder reactor, and to move towards the internationalization of the fuel cycle which most of us believe will be necessary if fission is to be used on a truly large scale.

#### 7. Environmental Hazards of Global Concern

We have discussed a heterogeneous set of complex environmental problems. In all cases the lack of knowledge - sometimes total ignorance - was apparent, and it is clear that intensive and time-consuming research is needed to provide answers to many of the most pressing questions. This dilemma poses secondary questions: should we initially concentrate on reasonably well-defined problems where, hopefully, answers might be obtained quickly; thus leaving other and perhaps more serious problems behind? How can the urgency of a problem be estimated, e.g. in terms of the risks involved in doing nothing about it now? What measures must be taken to ensure that adequate resources, including skilled manpower, will be devoted to these problems? Are there measures, based on available knowledge, that should be taken while specific answers to our problems are being sought?

We have concentrated on a few cases that could be discussed in some depth, and which illustrate the general aspects of the problems towards which our recommendations are directed. In particular, the fact that current thinking about the financial aspects of anti-pollution measures almost totally fails to consider



that the large and certain expenses must be seen in relation to the savings that would accrue in the health, maintenance, and agricultural sectors of the economy.

Conflicts often arise in which opponents of a given type of "management" (Such as the development of nuclear energy) demand that compatibility of the proposal with the global ecosystem be proven, while proponents require proof only of incompatibility.

To make motivations and reasoning in this type of environmental conflict more apparent, the physical extent of the proposed environmental changes and the time scale in the affected systems were discussed. It was unanimously agreed that compatibility must be required in case the global ecosystem may be involved, since otherwise irreversible changes might undermine the basis of life itself.

It is extremely difficult to obtain such proof, particularly if time lags play an important role, as in the cases of destruction of the ozone layer, heating of the biosphere as a consequence of energy production, CO<sub>2</sub> in the atmosphere, and nuclear waste.

In some instances countermeasures may be taken, provided the very early stages in a process that might lead to irreversible macro changes are observed and acted upon.

We discussed, as specific examples, environmental effects of particulate and gaseous pollutants, of nuclear waste disposal and of poisonous synthetic materials. With respect to the latter, the following applies:

The dangers connected with release of synthetic poisons are usually underestimated, but they can cause catastrophes, as did the accidental synthesis and release of TCDD (Dioxin) in Seveso. Many poisons are produced in chemical plants, which can affect life irreversibly by producing long-term and delayed toxic effects. We must face the fact that our knowledge is still insufficient concerning these substances, and unfortunately much of what is known is unavaibale because of exaggerated secrecy policies.

#### 8. Science, Scientists, and Society

The armaments race has continued unabated to the extent that today, according to an estimate recently published by SIPRI, 'over 400,000 scientists and engineers - half of the world's total scientific and technical manpower - are now employed on improving the existing weapons and developing new ones'. Also world military expenditure has reached the stupendous figure of about \$ 330 billion per year.



Recent developments in the arms race, such as the neutron bomb, the cruise missile, and sophisticated conventional armaments, are very likely to lead to both a new stage of nuclear proliferation and also an escalation of the arms race. In the face of these menaces, scientists have to be particularly vigilant and exercise justified pressures on the respective governments and the scientific community; they should also warn governments and mobilize world public opinion against such tragic developments.

Problems of development demand efforts of a high order. Consequently, scientists of high quality are required to tackle them. It was considered important to create the necessary conditions in LDC's which would encourage bright young scientists in developed countries to work in LDC's for long periods. Further, in the developed countries themselves, scientists and their institutions should be encouraged to undertake research on problems relating to development, in cooperation with scientists from LDC's. In such programmes, the aim should be not only to help LDC's, but also to promote their self-reliance.

Free movement of scientists and the freedom to express themselves without fear of imprisonment, or persecution including loss of job, are of extreme importance. In many places the freedom and universality of research and teaching are being restricted and subjected to all kinds of pressure, resulting often in the banishment of researchers and teachers. We appeal to all governments and people to respect academic freedom of scientists and their scientific institutions. Simultaneously, we urge all scientists to avoid abuse of their research and research potentials: scientists - no matter whether engaged in fundamental or applied science - cannot claim to be neutral.

Emphasis was given to the role of education for the young generation, young scientists in particular, in creating social awareness with regard to the misuse of science for military purposes, and the possible disastrous consequences of modern weapons, as well as the present serious status of the arms race and nuclear proliferation.

The existing career structure in science is opposed to the ethos of science, in relation to both disarmament and development. These are strongly influenced by the fact that a very high proportion of scientists are engaged in research with the military-industrial complex and also in the trans-national corporations.



It is important to study possible steps for a phased redeployment of scientists and technologists from destructive to constructive activities.

The scientist's responsibility is increased by knowledge of the implications of scientific discoveries. There is a need to explore the establishment of an international and independent mechanism which would review foreseeable consequences of sensitive technological advances for society. This mechanism should also attempt to evaluate relevant research so as to clarify any doubtful aspects and perspectives.

We call on scientists to refrain from taking part in work that is ethically unjustifiable, and to use their influence to prevent industry and government from pursuing such work. In doing so, these scientists would help in the creation of a new value system in the young generation.



ADDENDA AND CORRIGIA TO THE STATEMENT FROM THE COUNCIL

Page 7, para. 3, line 1:

delete "participants"

Page 10, para. 2, should read:

"The use of nuclear power for development within the next decades might be unavoidable in many developing countries and therefore the expansion of this source of power should not be hindered by restrictions applied by supplier states, as they lead not only to further dependence of LDC's on the industrialized countries but also constitute a serious hazard to their economic security. At the same time, steps should be taken through the IAEA to ensure that the use of such energy should not be diverted to military purposes".



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Director-General : Dr M. M. Kaplan (USA)

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Professor T. Toyoda (Japan)  
Professor V. G. Trukhanovsky (USSR)  
Professor M. S. Wionczek (Mexico)



Muhlhausen Conference  
Programme

Thursday, 26 August

- 09.30 - 11.45 First Plenary Session - Town Hall  
Chairman : Prof. E. Leibnitz  
Opening - Prof. Leibnitz  
Address by Prime Minister  
Message of Thanks by Secretary-General  
Messages of goodwill: *A. Nank*  
✓ Director-General's Report, Dr. Kaplan  
(time permitting)  
12 noon Reception by Prime Minister  
15.00 - 16.15 Second Plenary Session - Pushkin House  
Chairman : Prof. M. Nalecz ✓  
Director-General's Report (contd.) → *Jebel*  
Report on Wingspread Symposium,  
✓ Prof. A. Chayes  
✓ Report on Fourth CW Workshop, *chemical warfare*  
Prof. J.K. Miettinen  
16.30 - 18.00 Working Group meetings  
20.00 - 22.00 Special Plenary Discussion - Pushkin House  
Round Table Discussion on Code of Conduct  
for Scientists, Mr. A. Parthasarathi, Moderator

Friday, 27 August

- 09.00 - 12.30 Working Group meetings  
14.30 - 18.00 Working Group meetings  
20.00 - 21.00 Organ concert of Bach music - Divi Blasii Church

Saturday, 28 August

- 09.00 - 12.30 Working Group meetings  
14.30 - 18.00 Working Group meetings  
20.00 DNA recombinants (genetic engineering) - Pushkin House  
discussion, Dr. H. Marcovich, Moderator

Sunday, 29 August

- 08.00 - 18.00 Trip to Weimar  
19.00 - 20.00 Concert - Town Hall

Monday, 30 August

- 09.00 - 12.30 Working Group meetings  
14.30 - 18.30 Third Plenary Session - Pushkin House  
Chairman : Acad. O. Reutov  
Discussion of draft reports  
19.30 (*19.15 cocktail*) Banquet

Tuesday, 31 August

- 08.30 - 10.30 Working Groups (revision of reports) - Pushkin House  
11.00 - 12.00 Final Plenary Session - Town Hall  
Presidential address by  
Professor Dorothy Hodgkin  
Closing



1957 (1955)

1979 (World Conf. on S. & Techn.)  
Early Spring 1977 (India)  
York Meeting in London

Fred (Barnet)  
Chaps - Am. Ac. A. & S.  
for V. Willhoff  
- Alfred  
Chem. Warfare  
Dioxin  
? Reselsson  
Cups Council (44<sup>th</sup>)  
Aug 1972 (Nimrod)  
Ltr. to US by Air

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26th Pugwash Conference  
"Disarmament, Security and Development"  
Mühlhausen, German Democratic Republic, 26-31 August 1976

REPORT OF WORKING GROUP 2

CONTROLLING THE SPREAD OF NUCLEAR ARMAMENTS

1

I.

The great majority of the members of the Working Group continue to believe that the acquisition of nuclear weapons by more states would present a serious additional danger to world peace. Unless nuclear proliferation is prevented, the world situation will be increasingly unstable with an increasing danger of "limited" nuclear wars that could escalate into world-wide holocaust.

There was widespread agreement that there are major defects in the present non-proliferation regime, centering on what many call the discriminatory features of the Non-Proliferation Treaty (NPT); these seem to consign the non-nuclear weapons states (the vast majority) to a permanent status of less than full sovereignty. At the same time, in a certain sense, the Treaty legitimizes the possession of nuclear weapons by the small handful of existing nuclear weapons states. A few of our members questioned the overall value of the NPT. They argued that it has been a "soporific", diverting attention and effort from the real objective - the reduction and eventual elimination of nuclear weapons in the states now possessing them.



The great majority of the Group, although recognizing the validity and seriousness of the criticisms, could not accept these conclusions. This majority believes the NPT makes an important contribution to the effort to prevent the spread of nuclear weapons. A country does not lightly disregard, or even withdraw from, treaty obligations solemnly undertaken. The threat of withdrawal itself could operate as a sort of sanction. Moreover, the Treaty has become the basis for a major international norm stigmatizing the possession of nuclear weapons. In this sense it is a fulcrum for bringing pressures for nuclear disarmament to bear on the nuclear weapons states themselves. It was asserted by some that this leverage for pressure was available only because certain important states stayed out of the Treaty.

Nevertheless, all the members felt strongly that the efforts of the nuclear weapons states for disarmament have been inadequate. It is fair to say that no decisive progress has yet been made in the limitation of strategic weapons. The recent decision of the UK to embark on a tritium production programme is a glaring example of behaviour that reinforces illusions about the political value of membership in the nuclear club, thereby undermining the non-proliferation effort.



The obligation of Art. VI of the NPT, requiring the nuclear weapons states to negotiate in good faith for reduction of nuclear arsenals, is the reciprocal of the obligation of self-denial assumed by the other parties. Continued failure to achieve results will inevitably erode support and adherence to the NPT regime.

Time is growing short.

## II.

The connection between nuclear power and nuclear weapons was examined at length from the technical, political and psychological standpoints. There was widespread agreement that the operation of current generation power reactors, of itself, need not present a significant proliferation threat. Acquisition of bomb material from spent fuel is impossible without reprocessing. It was pointed out, however, that in the present circumstances the establishment of a nuclear power industry in any country would contribute to the technological base for a weapons program, and could generate political and psychological pressures that work in that direction through the acquisition of reprocessing facilities and breeder reactors.



The discussion focussed, therefore, on problems associated with the possible spread of reprocessing facilities, either for recycling fuel for use in current generation reactors or to produce plutonium for future breeder reactors. The plutonium extracted from spent reactor fuel is conceded not the best material for weapons purposes, but it could be used to construct a nuclear explosive, especially if yield and performance requirements are not important. Such a feat would clearly be within the capacity of a country with a modest nuclear capability (such as that implied by the operation of power reactors and small-scale reprocessing facilities).

There was a wider division on the question whether bomb production was within the capacity of criminal or terrorist groups who might gain access to reprocessed plutonium. It was stated that there are formidable difficulties in such an operation, but most thought that a group with the proper composition and resources would have a considerable possibility of success.

This led to a discussion of the potential adequacy of safeguards against diversion and physical security measures in a "plutonium economy" - that is one in which there is extensive reprocessing of reactor fuel. It was



said that, on some projections, as much as 5000 tons of plutonium would be produced annually from reactor operations. This is of special concern because of the very long half-life of plutonium and the difficulties of disposing of it. Moreover, the scale economies of reprocessing imply the use of large plants serving 30-50 reactors, spread over a considerable area and requiring large scale transportation of spent and reprocessed fuel.

Various suggestions for meeting these problems were put forward, including co-location of other fuel cycle stages at the reprocessing plant and the organization of multinational fuel centres. The recently adopted recommendations of the IAEA on physical security were noted, with the hope that they might be used as a starting point for national action by member states. Exports of reprocessing facilities were criticized and some called for a tighter control system for the transfer of nuclear materials and technology to be agreed on by all supplying countries. On the other hand, it was argued that supplier agreements restricting sales of reprocessing plants might violate Article IV of NPT and would further undermine the NPT regime. In any case, it is clear that the safeguards and physical security problems of reprocessing are not very well understood. Some thought



that reasonable assurance against diversion or theft could not be achieved without a militaristic or authoritarian system, incompatible with the ordinary conditions of civil society.

The discussion concluded with a long review of the prospects for deferring or avoiding altogether this kind of plutonium economy. It was agreed that for the present it is unrealistic as well as undesirable to think in terms of a universal ban on nuclear energy or even a moratorium. But it was also agreed that reliance on fission energy was likely to be only temporary and that it would ultimately be replaced by other energy sources, although when was a matter of debate. This assessment lends urgency to the arguments for deferral of an irrevocable commitment to reprocessing or breeders.

Estimates of high grade uranium resources and energy demand (based primarily on US data) were presented suggesting that uranium resources would be sufficient without reprocessing or breeding for at least 50 or 60 years, as opposed to the 20-30 years usually assumed. The potential advantages of the thorium breeder were mentioned. An array of possible alternative energy sources were also discussed, including fusion, geothermal <sup>solar</sup> and increased use of coal. As in previous Pugwash Conferences, there was general support for sharply



increased research and development on all these fronts. In particular, it was strongly suggested that R&D on solar power should be stepped up very steeply. At the present time, funds available for this work are not more than a few percent of the financial support for nuclear energy research. The work should include not only low-temperature applications and photo-voltaic generation of electricity, but also photo-chemical processes like the photolysis of water to produce hydrogen as a basic energy source.

The general conclusion was that the final decision on reprocessing and commitment to breeders could probably be delayed for at least 10 years without serious penalty. It was recognized that special problems might exist for some countries with high energy demand and/or little indigenous uranium or other energy resources. And a number of members thought it was necessary to "keep the breeder option open" - though there was disagreement about how intensive an effort would be needed for this purpose. But there was a significant measure of agreement that governments should be urged to proceed cautiously and to defer the acquisition of reprocessing facilities - or a commitment to breeder reactors - for a considerable period.



III.

The consideration of nuclear-weapon-free zones produced a major new Pugwash initiative. In response to a suggestion of the Madras Conference, Feld prepared and presented a draft treaty for a "world-wide nuclear-weapon-free zone". Past Pugwash Conferences have attached great significance to the concept of nuclear-weapon-free zones. It was thought that such zones would serve three purposes: enhanced security for countries situated within the zone, strengthening of the regime of non-proliferation and encouraging nuclear disarmament. But efforts to establish regional zones seem to have foundered because in every case one or more countries in the region refuse to join. The emphasis on security in regional terms prevents realization of a nuclear-weapon-free zone in these circumstances. Our review of the experience with regional zones, including a *recent* UN study of the subject, confirmed the difficulties with the traditional approach.

By contrast, Feld's proposal contemplates a treaty open to any country, anywhere in the world that is willing to undertake not to allow nuclear weapons on its soil. The requirement of substantial unanimity in a particular region is eliminated. A copy of the Feld draft is attached.



The Group welcomed the Feld draft and recognized that it was an important contribution to the discussion of nuclear-weapon-free zones, which has been stalled for some time. The draft is a preliminary effort, however, and leaves many questions unanswered. The Working Group could not fully analyse these in the time available, but it identified enough to be confident that a detailed study of the concept is now warranted. The Group recommends that Pugwash should promote a ~~working group~~<sup>shop</sup> or symposium to begin such a study. Among the topics to be considered are the following:

1. Definition of a nuclear weapon. The definition in Article 4 of the draft, adapted from the Treaty of Tlatelolco is clearly unsatisfactory. The substantive issue is the status of peaceful nuclear explosions under the Treaty.

2. Definition of a non-nuclear-weapon country. The draft provides that the Treaty is open to any state undertaking not to permit nuclear weapons on its territory. But some argued that a member of a military alliance whose doctrine permits use of nuclear weapons in war cannot be considered a non-nuclear-weapon country, and should not be eligible for membership.



3. Guarantees. The draft includes a protocol under which nuclear powers would agree not to use nuclear weapons against parties to the Treaty, and some thought that such guarantees were essential to the concept. Others thought that reliance on guarantees was inconsistent with the main object of the Treaty, which was to dramatize that nuclear weapons are a negative element in international relations. Some participants argued that the seeking of a guarantee would be a sign of acceptance of the legitimacy of nuclear weapons. Hence the new draft should eschew the guarantee.

4. Verification. Is it necessary, and if so to what extent should the IAEA, or any nuclear-weapon-state, be <sup>used</sup> ~~relied on~~ to provide it?

5. Transit. Should the Treaty prevent transit of nuclear weapons through the territory, including territorial waters, of the parties? The question poses a trade off between the possibility of wider membership if transit is permitted and a more rigorous conception of "nuclear-free", if it is not.

6. Regional versus world-wide approach. Can they be pursued simultaneously or are they mutually exclusive? Which is to be preferred?



7. Withdrawal clause. Is it desirable, and how should it be formulated?

Although many notes of caution were sounded, there was agreement that the Feld proposal was an unusually promising line of approach.

#### IV.

In the course of their discussion of guarantees in connection with nuclear-free zones, many of the Working Group expressed bitter disappointment at nuclear powers that have continued to refuse to renounce the first use of nuclear weapons. This led to a somewhat broader discussion of recent developments in nuclear weapons doctrines. In the United States, we are witnessing new formulations of the ~~well known~~ doctrine of flexible response, including renewed emphasis on possible first use of nuclear weapons. At the strategic level, a retargetting strategy has been proposed, which calls for selective attacks against a limited number of military installations at a certain stage of an armed conflict. At the tactical level "mini nuclear-weapons" are being developed, which tend to obliterate the distinction between nuclear and conventional warfare. ~~A nuclear first strike doctrine has also been formulated.~~

Such concepts are dangerous, and the Working Group condemns them. The casualties from even a limited counter-



force strike would be enormous. Moreover, given the current array of strategic forces, and the range of circumstances that might occur in wartime, there is no way to guarantee that limited resort to nuclear weapons - whether in the form of "selective response" or the battlefield use of "mininukes" - can be kept limited. It is much more likely that the conflict would become unlimited and world-wide. Finally, such doctrines are themselves incentives to proliferation.

Nuclear non-proliferation must be complemented by efforts to prevent limited nuclear wars and should eventually lead to the renunciation of force and the prohibition of nuclear weapons.

∇.

Everyone supports a comprehensive test ban treaty. But there is a sharp division about what such a treaty should include. There are two chief points of difference:

1. Peaceful nuclear explosions - should they be prohibited or not? One group maintains that they have important economic potential, and at least exploration of this should not be foreclosed. A thermonuclear explosion with drastically reduced radioactivity might be technologically possible. The other argues that there is no real economic significance and the difficulty of ensuring that an ostensibly peaceful explosion is not used to acquire military



information is so great as to require prohibition. A solution advocated by some: peaceful explosions would be prohibited unless conducted under international auspices in accordance with arrangements negotiated under Article V of the NPT.

2. Should adherence of all nuclear weapons states be required or not? One group maintains that the comprehensive ban should not go into effect unless all nuclear powers - particularly France and China - are parties. Otherwise complying states will have no assurance that non-signers will not make significant gains. The other group holds that although it is true that the unwillingness of nuclear powers to adhere to such a treaty cannot be justified, nevertheless, the great bulk of the testing is carried on by the US and USSR. They have an immense quantitative and qualitative lead in strategic weapons, and less to gain from continued testing. Although it would be desirable for the others to adhere, a test ban for the US and USSR would be valuable in its own right and could be accepted without risk. A solution advocated by some: a test ban for a limited period, say five years, after which the situation would be re-examined to see whether any problems had arisen because of the non-adherence of nuclear powers.



It was also urged that a similar review of the progress made in respect of Article VI of the Non-Proliferation Treaty and threat of withdrawal of states from the Treaty may also have a deterrent effect on the nuclear weapon powers.

A similar division arose with respect to the Threshold Test Ban Treaty. One group maintained that this was a positive development and a step towards a comprehensive ban. The other thought these aspects were outweighed by the height of the threshold (150 KT). Likewise, there was disagreement whether the effect of the Treaty in legitimating PNEs should be considered positive or negative.

#### Conclusion

As in the past, the Working Group discussion produced a number of technical suggestions for inhibiting nuclear proliferation and alleviating related problems - the risks of diversion of nuclear materials and safeguards against such diversion; the anxieties and concerns surrounding the plutonium economy and peaceful nuclear explosions; the difficulties of achieving nuclear-free zones. But in the last analysis, these problems cannot be solved by a technical fix or institutional gimmick. The essential requirement is political will.



And the necessary political will is increasingly paralyzed by the failure of the nuclear weapons states to reduce their weapons stockpiles and their reliance on doctrines involving nuclear weapons as instruments of war. So long as there are no effective steps toward nuclear disarmament and no substantial reduction in nuclear arms, the problems of further nuclear proliferation and diversion of fissile materials will remain with us in acute form. The responsibility for initiating such steps rests squarely on the nuclear powers, and particularly the US and the USSR.



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JOHN F. KENNEDY

The sense of personal loss which all men of good will must have felt at the tragic death of President Kennedy, was particularly strong in those associated with Pugwash. Although not a scientist he was one of us. He was firmly convinced of the necessity to create conditions in which people would live in peace with each other, and he believed that scientists could significantly help in this. Kennedy looked to us for ideas on reaching an agreement on disarmament as well as on international collaboration in science. The excerpts from his messages to our Conferences, printed below, testify to his deep understanding of the role and aims of the Pugwash Movement and of his appreciation of our efforts.

From the message to the Seventh and Eighth Conferences  
in Vermont, September 1961:

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

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

From the message to the Ninth and Tenth Conferences  
in England, August-September 1962:

"I had hoped that by the time of your meeting an agreement would have been reached in Geneva on the suspension of nuclear tests. Unfortunately this has not been possible. It is my sincere hope that your Conference will explore fully and objectively the basic reasons for our failure thus far to reach agreement. I can assure you that the results of your unofficial deliberations will be examined carefully by

those in my Administration who are concerned with these problems, as well as by me personally. The problem of helping to create arrangements which will permit people the world over to live in peace with each other is your greatest concern, as it is mine. Since assuming office I have devoted the greater part of my time to international questions, and I am constantly searching, with an open



mind, for new approaches to old problems. We have already established the Agency for Arms Control and Disarmament and are staffing it with men of high competence. We have mobilized scientists who are studying technical problems of arms control and disarmament, including the special problems presented by a nuclear test ban agree-

ment. We are studying the political aspects of disarmament, so that we can better help with the formulation and creation of adequate political arrangements for keeping the peace.

I can assure you that I am willing to give serious attention to any suggestion for creating a disarmed world which would not jeopardize the security of my country".

From the message to the Eleventh Conference  
in Dubrovnik, September 1963:

"Significant advances have been made since your last meeting. We now have a rapid and effective means of communication between my country and the Soviet Union and, more important, we have signed a nuclear test ban treaty which will bring about a cessation of nuclear weapons testing in the atmosphere, under water, and in outer space. Although these initial steps are limited, their achievement encourages us to look forward to more substantial progress. In your Conference you will have an opportunity to speak frankly with each other and to explore various avenues for further disarmament measures and other means of reducing international tensions. These problems are not simple, but personally I have the fullest confidence that we will

succeed in finding new solutions. People all over the world want to live in peace, and devising a system to secure this goal is a major concern of my Government. Many of our best minds are engaged with this problem, working on all levels, technical, political, and economic. Your unofficial deliberations will be examined carefully by them as well as by myself.

The broader and better informed is public discussion of these issues, and the more every government shows its concern with and response to such public discussion, the greater the prospects for further and bold steps in disarmament that will allow us significantly to reduce the dangers and burdens of the arms race".

#### IMPRESSIONS FROM DUBROVNIK

B. M. Vul  
Soviet Union

By far the most urgent problem nowadays is the preservation and strengthening of peace in the world. Just as the overwhelming majority of mankind, so also most scientists in the world are conscious of this fact. This is why the Pugwash Movement, which tries to seek a solution to this problem, has found a lively response and profound support

among the scientists. The recent Eleventh Conference at Dubrovnik will doubtlessly make a valuable and useful contribution towards the establishment of mutual understanding and of rapprochement among the scientists of various countries, as far as their attitudes with respect to the most important international problems are concerned.



We are witnessing at present the establishment of objective conditions, when the efforts of persons of good will can effectively help in the struggle to eliminate war from the sphere of relations between states. Since science plays a highly important role in modern society, the activity of scientists, directed towards the preservation of peace, acquires a special significance. It is evident that, in this noble pursuit, scientists must not imitate the diplomats, but should find their own working methods. The Pugwash Movement has gradually developed its specific features. However, to judge by the Eleventh Conference, it would have been desirable if these specific features of the Movement were manifest more vividly.

My impression - based, it is true, on only one Conference - is that we give often a great deal of consideration to a detailed analysis of problems requiring knowledge which some of us lack. I doubt whether going into such great detail is really the aim of our work.

On the other hand, I think that the Pugwash Movement should expand and draw an increasing number of scientists into its sphere of activity. I learned at Dubrovnik that, in a number of countries, there exist national Pugwash groups. I think that it would be useful to create such groups in all countries and to enlist the services of wide circles of scientific workers.

Finally, at the request of our Secretary-General, Professor Rotblat, I should like to communicate my entirely personal impressions from the Dubrovnik Conference. This was my first Pugwash

M. Meselson  
United States

As a newcomer to Pugwash having gathered most of my impressions from one Working Group at Dubrovnik, they are rather tentative. However, I came away feeling that Pugwash, at least at Dubrovnik, had lost considerable

Conference and, like any other opportunity of meeting scientists from various countries, it was both a useful and pleasant experience. Yet it appeared to me that a Pugwash Conference differs in its spirit from conferences devoted to special scientific problems.

The most characteristic feature of many scientific conferences which I have so far attended is the spirit of friendship, which is established right from the start between the members, even those who have not met each other before. This spirit of friendship prevails during the scientific discussions which are conducted at meetings, at the blackboard, as well as during meals or during intervals between the meetings. During the Pugwash Conference I encountered for the first time a new kind of relationship between scientists, when they discuss not the results of their scientific work, but the social consequences of the application of such results, which they appraise from diverse ideological standpoints. One would like to see, in spite of these differences, the spirit of friendship continue to prevail in future Pugwash Conferences, at which the solution of complex international problems is to be sought.

First impressions are usually the strongest ones, though not always the most correct ones. It is certainly possible for me to be wrong. There is, however, no doubt that the strengthening of friendship between scientists of diverse disciplines, and the expansion of activities of the Pugwash members will make their contribution to the preservation of peace between nations, which has become the indispensable condition if life on earth is to be preserved.

initiative in its attempts to find ways of securing peace. The substantial lessening of international tensions and especially the signing of the Moscow Treaty left Pugwash scientists not so far ahead of the general level of thinking in these



matters as they used to be. Certainly this is a welcome development but it may require that Pugwash somewhat alter the nature of its Conferences so as to maximize its leverage and relevance to the international problems which remain to be solved.

Perhaps what is needed is an approach in greater depth than before to certain key problems of disarmament and international politics. Take the problem of arranging a minimum deterrent or "umbrella" force. It would be most useful if Pugwash could invest the time and effort required to produce a thoroughgoing analysis and set of proposals for reaching international agreement on such a step. I single this measure out from others because even in today's more relaxed atmosphere, we face the danger that technical developments, possibly in the area of

missile defence, could drive the arms race to still higher levels making international agreements in other areas very difficult to reach. An agreement to move toward a minimal deterrent would act strongly to damp down accelerating tendencies in the arms race. At Dubrovnik, this problem received considerable attention. I hope that in future Pugwash meetings it can be given a priority high enough to yield proposals capable of catching the attention of governments and of the general public. To accomplish this, Pugwash delegates will probably have to do more work in advance than most of us did for the Dubrovnik Conference. It would be especially useful if an exchange of letters between interested Pugwash scientists on this and other important subjects could be conducted in advance of each meeting.

W. E. Kerr

Brazil

Since this was the first time I attended a Pugwash Conference I decided to compare the Ninth and the Eleventh Conferences, at Cambridge and Dubrovnik, which were concerned with the same problem. Comparing the list of participants in this Eleventh Conference I noticed that 60% were, like myself, newcomers to the Pugwash Movement. A brief comparison of the contributions in 1962 and 1963 shows the difference of the climate of opinion, of environment, of tensions, in which both Conferences took place. The basis of the Ninth Conference was on suggestions to reach some degree of disarmament. The tone of several papers (Talensky's, for example) shows bitterness and little hope. However, Working Group 4 came out with a brilliant conclusion: "Security in a disarmed world must not be based on national defence but on the power of an international authority". I noticed that the Continuing Committee did follow

the suggestion of Group 3, to convene a special conference of social scientists. The suggestion of Sir Julian Huxley (made at the London Conference in 1962), on behalf of a highly qualified group, is still waiting for the Pugwash Movement to lend its name, support and guidance, in the organization of a conference concerned with education.\*

The climate of this Eleventh Pugwash Conference was full of optimism, and the messages from Heads of State, Kennedy, Khrushchev, Tito, etc., were certainly a wonderful start. No doubt the impact of the test-ban agreement was the main stream of the euphoria.

I would say that "europe-centrism" was quite evident in both Conferences. For instance: one meets very frequently phrases, such as "disarmament would lead to an enormous surplus of resources (120 billion dollars were devoted to military expenditure

\* Editor's Footnote:

This suggestion was taken up with UNESCO and it is hoped that action will follow.



in 1962) which could be used to increase aid to the under-developed nations of the world". However, when it comes to the moment to suggest the establishment of a World Centre of Scientific Research, the place thought of is in an already highly developed country such as Berlin. Why not Brasilia, Montevideo, La Paz?

The decision to have the next meeting in India, on the correlation between "underdevelopment" and "World peace" will certainly raise the interest of the under-developed countries to create local "Pugwash Movement" groups, as is already happening in Brazil.

H. Afheldt

Federal German Republic

#### PUGWASH CONFERENCES AND THE NATIONAL GROUPS

Some of the activities of the national Pugwash groups are directed against the so-called 'taboos' in the public opinion in the given country, which hinder the realization of the true situation of our society. Although we know that every society builds up such taboos, we believe it is one of our responsibilities to fight against such taboos in our own country. On the one hand, we believe that it is essential for each individual Pugwash group in each individual country to be successful in these efforts if we are to achieve substantial progress towards a peaceful world system. On the other hand, we believe that, in every country, these successes depend on certain specific conditions. Each Pugwash group knows best the conditions prevailing in its country. For this reason, it would be useful to describe briefly the conditions prevailing in the German Federal Republic:\*

The procedure adopted at Pugwash Conferences in the handling of material from the Conference makes it very difficult to promote the implementation and dissemination of proposals worked out jointly in the Working Groups of the Conference. In practice, the publication of findings is of any use only if the efforts of the Working Groups result in bringing forward new points of view, which would make it possible either to refute existing objections to our proposals, or to eliminate these objections by suitable modifications of the proposals.

The more substantive the new proposals are, the less is the likelihood that the work of the Pugwash groups and of the scientists involved in it will be discredited.

Such new ideas are usually likely to emerge after prolonged and detailed discussions. It may well be that it is not the task of the Pugwash Movement to engage in details of political issues. However, even if we limited ourselves to problems which can be solved by purely scientific methods, such as the number of inspections per year necessary to provide security against <sup>infringement of</sup> a test-ban treaty, or other similar important problems, we would demonstrate to the world that the unofficial amateur-diplomats at our Conferences are able to discover new paths of understanding and pave them for the official diplomats. But this too necessitates discussions which would not shrink from going into detail.

In this respect, the experience of Dubrovnik has shown up the weakness of the method by which the Reports from the Working Groups have to be submitted to the whole Conference not only for "acceptance" but also for "approval". On points of detail the Working Groups can reach agreement only by means of a compromise, which is often achieved as a result of painstaking detailed work in the Group, sometimes even in sub-groups of two or three participants. When the

\* A report of the activities of the Association of German Scientists is given on page 58.



Report from the Group is then submitted to the obtuse mechanism of the whole Conference, the subtle grounds for the compromise are often completely lost, if only due to shortage of time. The result of this may easily be that out of the whole work of the Working Group, all that remains are some old proposals, which have long ago been refuted by one side or the other of the opposing blocs, whereas the real achievements of the Working Groups fail to gain the approval of the Conference.

In Dubrovnik, for example, Working Group 3 worked out the steps necessary to stabilize the situation in Europe, which (as far as can be visualized at present) would have offered a chance for a good start. However, these new ideas failed to get the approval of some of those present at the plenary session. For this reason the whole Conference finally adopted only the resolutions urging the governments concerned to enter into negotiations leading to the lessening of tensions in this area and to the establishment of a denuclearized Central Europe.

There is nothing new in this proposal. Moreover, in this form, it is likely to be misunderstood in Western Germany as recommending the unconditional recognition of the German Democratic Republic and a shift in the military balance as a result of denuclearization.

It is, of course, open to dispute whether the non-recognition of the German Democratic Republic by the Federal German Republic is the last word of wisdom. However, a resolution of this kind will not bring about a change in attitude of the people who matter. What it may achieve is to reduce the chance of success of the Pugwash Group and of the Association of German Scientists in our country.

The situation would have been entirely different had the marginal conditions for the proposed negotiations and

for the creation of a denuclearized zone, which had been the subject of long arguments in the Working Group, also obtained the 'approval' of the Conference because some of the new ideas worked out in the Group would have eliminated the misgivings inherent in the thinking of the influential circles in Western Germany.

For example, one of the first points which was made clear in the discussion of the Group was that the pre-requisite of any denuclearization is that it would not result in any military advantage for either of the parties. Further, the Working Group has concluded that there exists a close link between the creation of such a denuclearized zone and an agreement on the demarcation line in Central Europe, and that any new treaty would have to stipulate free access to Berlin. It was also envisaged that one of the first steps in negotiations leading to lessening of tensions must be the negotiation of a non-aggression pact which would define the meaning of aggression within the framework of this pact.

How fruitless such general statements can be in the climate of the Federal German Republic can perhaps be visualized from the following discussion in the German Federal Parliament.

During question time on 7th December 1962, the Deputy, Dr. Walter Menzel (German Socialist Party) put the following question to the Foreign Minister:

"What were the reasons for the Federal Government's omission to send a message of greetings to the Tenth Pugwash Conference which took place in London in September 1962 and which was attended by 220 scientists from 35 countries, and dealt with such topics as  
" The position o f



the scientist in the community", "International scientific collaboration", "Science in aid of developing nations" and "Science and education"?

The following written reply was given by the Secretary of State for the Foreign Office, Professor Carstens (dated 7th December 1962):

"The Federal Government has followed with interest the Pugwash Conferences held up to now, but has so far refrained from giving them a sort of official recognition by sending greetings. At the beginning these Conferences were under considerable Eastern influence. The Federal Government has noted with satisfaction that, as from 1960, a change has occurred in this respect, but thought it advisable to wait for further developments before sending for the first time, and perhaps, before some other participating countries, a message of greetings".

Deputy Menzel thanked Professor Carstens in a letter dated 20th December 1962 and put the following supplementary question:

"Is the Federal Government prepared to send a message of greetings to the Pugwash Conference to be held next year since these Conferences are held every year and considering that the British Government has received the last Pugwash Conference officially, and that the Minister for Science of the British Government has opened this Conference and given a long speech, and that, moreover, a number of Heads of State have sent messages of greetings, including Kennedy, Macmillan, Nehru and others?"

The Foreign Minister Dr. Schröder replied to this question on 7th January 1963:

"With reference to your supplementary question concerning the Tenth

Pugwash Conference, contained in your letter dated 20th December 1962, I should like to state the following:

"It is known to the Federal Government that the British Government organized a reception for the Tenth Pugwash Conference and that a number of Heads of State had sent messages of greetings on the occasion of the opening of the Conference. The next Pugwash Conference will take place this summer in New Delhi. It is to be assumed that, like in the previous Conferences, scientists from the Soviet Zone of Occupation will also be invited.

The Federal Government will examine in due time the question whether it would be fitting for the Federal Chancellor to send a telegram of greetings. It will be necessary to take into consideration whether the scientists from the Soviet Zone of Occupation will accept the invitation and whether a telegram of greetings may be expected from the rulers of the Soviet Zone of Occupation".

We are not of the opinion that this argument of our Government is sound. In particular we do not believe that it is more damaging to the interests of the Federal Republic when, in addition to the messages from the U.S.A., the U.S.S.R. and the German Democratic Republic, there arrives also a message from the German Federal Republic, than when Germany is represented at the Conference only by a message from the German Democratic Republic. However, the important thing is not that we consider the attitude of the Government of the Federal German Republic to be wrong in this respect but only how we can alter it.

We know very well that Pugwash does not exist just for Western Germany. Similarly we realize that the very things



which may impair its influence in our country may enhance it in other countries. It must be the task of the Pugwash Groups to find a compromise which would achieve the maximum total effect.

Perhaps we may recall the suggestion made by Academician Artsimovich who, if we have understood him correctly, recommended to abolish the "approval" procedure by the whole Conference and instead to authorize the

I. Supek  
Yugoslavia

A UNITED NATIONS ORGANIZATION OF COLLECTIVE SECURITY  
UNDER THE SPONSORSHIP OF THE GREAT POWERS

In the present situation, when both nuclear powers possess a capacity for global destruction, the non-aligned countries are faced with the acute problem of their own armed forces. Obviously, they cannot dream of modern rocket armaments which might represent a threat of retaliation against the big powers. The small powers cannot counter an atomic attack with anything but awareness of the criminal madness of such an act. What then is the purpose of their conventional armaments?

In the first place, all these non-aligned countries and small powers live in a complicated network of local and world tensions, from which frontier conflicts, and even invasions, are not excluded, either without direct participation of the nuclear giant powers or with their hidden aid. Moreover, and this represents a major obstacle to peace, armed forces with ambitious generals at their command are in many countries the most important factor in the struggle for power, and they are, unfortunately, often the pillars of political stability. In view of these intertwined contradictions it would be unrealistic to expect the small powers immediately to respond to a request for total disarmament, without adequate measures of

Continuing Committee to prepare a statement based on all accepted papers. We believe that this is a good proposal for future Conferences. Even if this method should result in making the discussions within the Working Groups less flexible, these Groups are still more suited - and have more time - for the sorting out of useful compromises than the plenary session of the whole Conference.

protection. But, on the other side, the desire to obtain more up-to-date weapons means a growing pressure on those countries which are often in the initial stages of economic and technical development, and every economic sacrifice made to strengthen the military potential gravely impedes the progress they long for.

Should the non-aligned countries and small powers get themselves involved in mutual internal contradictions, they would hardly be able to appear as an important factor on the world arena. The absence of their intervention might be fatal should the big powers get stuck on certain positions. In a world full of threat, the non-aligned countries must try to find a way not only out of their own difficulties but also leading to general disarmament. Only if they become a universal force for peace will the non-aligned countries be able to escape the consequences of their very complex and hard situation.

What the non-aligned countries can undertake with determination at present is the transition from an undermined national defence to a system of international security under the sponsorship of the United Nations. The non-aligned nations (not necessarily all of



them) could, as a first step, agree to enter their armies into a United Nations Organization of Collective Security. These national contingents will be stationed on their national territories and be subordinated to the authority of the national governments. Likewise, in this early period the national contingents would be financed mainly from national sources. The international system would, however, begin to be felt. The duration of this transitional stage would depend on the parallel measures of other states, specially the big powers, towards general disarmament.

The non-aligned countries, and other powers which would join the Organization of Collective Security of the United Nations, would form a Council which would then nominate a supreme command; the commanders of national contingents would be nominated by national governments and jointly appointed. In this manner, every country would continue to decide on the selection of officers of its own contingent. As a rule, the Organization of Collective Security of the United Nations would intervene only if a member country of the Organization was attacked. The General Assembly, however, could with a two-third majority and the decision of the Security Council order an intervention in other cases. Every member would, in the first stage, have the right of veto on the use of its contingent; it would also have the right to withdraw from the Organization.

It is to be expected that the Organization of Collective Security might attract some other small powers at present attached to one of the blocs. Thereby, the rigid bloc structure would begin to soften, and the universality of the United Nations would increase.

The agreement of the group of non-aligned countries and small powers on the formation of the Organization of Collective Security would come into force

upon the approval by the United Nations General Assembly and upon acceptance of guaranties for its security by the nuclear super powers. This would initiate the first stage of a general disarmament programme which would be supplemented by equally important steps, such as the complete ban on nuclear tests, the prevention of further spread of nuclear weapons, the formation of atom-free zones, viz. zones of reduced armament. There can be no doubt that the proposed initiative on the part of the non-aligned countries would considerably speed up the solution of these urgent problems. A universal zone would thus stretch between the two nuclear giants, the U. S. S. R. and the U. S. A., who would ultimately join it.

The Organization of Collective Security would in advance renounce the use of nuclear weapons, and so it could admit the big powers only at a definite stage of their nuclear disarmament, accompanied by a certain reduction of conventional weapons. When joining the Organization of Collective Security, the national armies would automatically be reduced to a prescribed level of national contingents. If all this is achieved, the first stage would already represent an important step towards general disarmament and towards security in the world. Even if only the small powers were embraced by it, its impact on the general climate would be immeasurable and the former "non-aligned", the present "universalists", would become a genuine moral force of mankind.

The U. S. S. R. and the U. S. A. have agreed at the United Nations General Assembly that a Peace Force is necessary for the maintenance of peace in a disarming world, but the concept of such a force had encountered many doubts based on bad experiences. There were many in the West who stressed that general and total disarmament was unacceptable, as long as there was



no reliable protection of peace in future. Such arguments would obviously mean that we shall remain in a vicious circle unless the non-aligned nations make a decisive breakthrough. The formation of the Organization of Collective Security and the strengthening of the United Nations could create favourable conditions for the disarming of the nuclear giants, which is the ultimate goal of all our efforts.

The beginning of the disarmament of both blocs would open the second stage which might follow closely upon the first, and might even run parallel to it. According to all the negotiations which have so far taken place, and in view of the differences in the armed forces, this first step in the disarmament of the Soviet Union and the United States must obviously be sufficiently large, so that both countries will be left with an approximately equal military potential. Once an equal level is attained on both sides the problem of inspection and control would no longer seem insoluble. (A reduction in armaments based on percentage, as envisaged by the original American plan, would result in dangerous disproportions, especially after any one service of the armed forces has fallen below the efficiency quantum level). In this stage the destruction of the vehicles for the delivery of nuclear bombs would take place, together with the radical reduction of conventional forces in both camps; all this would be accompanied by the liquidation of military bases on foreign territories.

The third and final stage would end with general and total disarmament, investing the United Nations Organization of Collective Security with the role of guardian of world peace. In this stage the Organization of Collective Security would be joint by the big powers, as well as by all the members of the United Nations, and the armed forces of the Organization of Collective Security itself would

be kept on a given low level, composed mainly of light expeditionary units, which could quickly and efficiently intervene in possible frontier conflicts. It may be expected that the very existence of such an international security system, and even more the change in all the relations among the nations, would radically prevent military attacks.

As demonstrated by previous analyses, general and total disarmament, with the conversion of war industries for peaceful purposes and with appropriate diversion of the staff, could be easily carried out in the four year period, without major economic difficulties. This period of time would also be most favourable for the execution of the proposed plan, which would begin with the formation of the Organization of Collective Security of the non-aligned nations and end with the joining of the organization by the disarmed big powers.

The Moscow agreement has provided a decisive turning point in the attitudes of the big powers themselves. However, it would be dangerous to wait passively for their initiative only. The non-aligned countries could send a strong south wind to those slightly softening fronts. The transition to an international system of security, under the sponsorship of the United Nations and the two nuclear super powers, is in the most vital interest of the non-aligned countries. It would, on the one hand, relieve them of the financial burden involved in the maintenance of a national army and at the same time strengthen their protection and, on the other hand, it would exercise a favourable influence on their entire social progress. Rising from their historical backyards to the stature of a universal force, the non-aligned countries together with numerous small powers will become the forerunners of a world of lasting peace.



M. Kaplan  
United States

## BIOLOGICAL WARFARE

One of the working papers prepared for the Dubrovnik Conference, by Academician I. Malek and Professor K. Raska of Czechoslovakia,\* concerned the problem of biological and chemical warfare (BCW). Some of us in Working Group 2, as well as other participants (Marcovich, Malek, Kaplan, Meselson, Maaloe, Rich), had several informal beach discussions on this topic. We felt that some first steps towards meeting the inspection problem of BCW might be feasible for Central European countries.

The statement issued by the Fifth Pugwash Conference in 1959 points out the difficulties of adequate inspection for biological and chemical weapons, and this is stressed also in the paper by Malek and Raska. It is not generally known that a limited biological weapons inspection procedure has in fact been in operation in member countries of the Western European Union for several years. This is a completely voluntary operation whereby laboratories are visited periodically by a small inspection team, and their production records and research trends are examined. The permanent technical staff for this function is very small, one or two people, but additional scientists may be co-opted for particular assignments. In Dubrovnik, the group discussing this considered that a similar arrangement could be effected on a trial basis by a small group of countries, selected from, or including all of the following: Austria, Czechoslovakia, Denmark, Hungary, Italy, Netherlands, Poland, Yugoslavia.

The pilot project set up for this purpose could serve as a testing ground for the many difficulties that will beset the BCW aspect of disarmament negotiations between the larger powers. At the beginning, for example, suspicions of possible espionage could be allayed with the use of combined East-West teams, notification of laboratories before inspection takes place, agreement as to production records to be submitted to scrutiny, etc. Also a step will have been taken to work out a means of lessening the potential for chemical warfare as the smaller and poorer nation's substitute for nuclear weapons. De-nuclearized zones in different parts of the world should include agreement on banning the production and stockpiling of biological weapons.

We have made no progress since the Report from the Fifth Pugwash Conference in 1959 in facing up to the problem of BCW. The Report is well worth re-reading. I believe it retains its validity as an overall assessment of the problem. Activity by the great powers has continued in this field, and technological improvements for production and delivery systems and for other factors are bound to have taken place. Friction amongst small countries in various parts of the world has not lessened. Secrecy on BCW is still the accepted norm.

It would seem, therefore, that the pilot project suggested above, or a similar undertaking, is well worth activating as soon as possible.

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\* Proceedings of the Eleventh Pugwash Conference, page 194.



CLASSIFICATION OF PARTICIPANTS IN THE PUGWASH CONFERENCES

I. BY PROFESSION OR FIELD OF STUDY

A. PHILOSOPHY AND MATHEMATICS

1. Philosophy

Dr. R. W. Burhoe	USA
Father P. L. Dubarle	France
Dr. E. Heimendahl	FGR
Dr. S. L. Kwee	Netherlands
The Earl Russell	UK
Prof. Yu Kwang-Yuan	China

2. Mathematics

Mr. K. Abbiw-Jackson	Ghana
Dr. D. G. Brennan	USA
Dr. D. Kybal	USA
Prof. H. Lenz	FGR
Prof. P. C. Mahalanobis	India
Dr. C. Obi	Nigeria
Sir Alexander Oppenheim	Malaya
Prof. P. Rosenstiehl	France

B. PHYSICAL SCIENCES

1. Physics (including biophysics and geophysics)

Dr. N. Z. Alcock	Canada
Acad. A. P. Alexandrov	USSR
Prof. E. Amaldi	Italy
Dr. T. E. Armstrong	UK
Acad. L. A. Artsimovitch	USSR
Prof. H. Barwich	GDR
Prof. P. G. Bergmann	USA
Prof. J. D. Bernal	UK
Prof. G. Bernardini	Italy
Prof. H. A. Bethe	USA
Dr. H. J. Bhabha	India
Prof. P. M. S. Blackett	UK
Acad. N. N. Bogolubov	USSR
Prof. M. Born	FGR
Dr. M. Breitenecker	Austria
Prof. R. B. Brode	USA

Prof. H. B. Brown	USA
Sir Edward Bullard	UK
Prof. W. E. Burcham	UK
Prof. E. H. S. Burhop	UK
Prof. G. Burkhardt	FGR
Prof. J. Catala de Alemany	Spain
Prof. Chou Pei-Yuan	China
Sir John Cockcroft	UK
Prof. M. Danysz	Poland
Sir Charles Darwin†	UK
Prof. W. C. Davidon	USA
Prof. N. A. Dobrotin	USSR
Prof. F. Dyson	USA
Prof. A. Engstroem	Sweden
Acad. E. K. Fedorov	USSR
Prof. B. T. Feld	USA
Prof. B. H. Flowers	UK
Prof. J. S. Foster	Canada
Dr. H. Franz	FGR
Prof. H. Friedrich-Freska	FGR
Prof. D. Frisch	USA
Prof. O. R. Frisch	UK
Dr. G. W. Funke	Sweden
Prof. D. A. Glaser	USA
Prof. C. J. Gorter	Netherlands
Prof. B. P. Gregory	France
Dr. J. Gueron	France
Prof. W. Heitler	Switzerland
Dr. W. A. Higginbotham	USA
Dr. D. L. Hill	USA
Dr. M. N. Hill	UK
Prof. H. Hönl	FGR
Prof. G. F. Houtermans	Switzerland
Acad. H. Hulubei	Rumania
Prof. L. Infeld	Poland
Dr. D. R. Inglis	USA
Prof. L. Janossy	Hungary
Dr. M. Kalkstein	USA

† deceased



Dr. S. Kamefuchi Japan  
 Acad. P. L. Kapitza USSR  
 Mr. A. H. Katz USA  
 Prof. W. Kliefoth FGR  
 Sir K. S. Krishnan† India  
 Prof. O. Kofoed-Hansen Denmark  
 Prof. C. M. C. Lattes Brazil  
 Prof. C. Lauritsen USA  
 Prof. O. Leipunski USSR  
 Prof. M. G. K. Menon India  
 Prof. K. P. Meyer Switzerland  
 Prof. L. Mezzetti Italy  
 Prof. Y. Miyake Japan  
 Sir Nevill Mott UK  
 Prof. W. Munk USA  
 Acad. G. Nadjakov Bulgaria  
 Prof. B. R. A. Nijboer Netherlands  
 Prof. I. Ogawa Japan  
 Sir Mark Oliphant Australia  
 Prof. J. Orear USA  
 Prof. L. Pal Hungary  
 Dr. H. Palevsky USA  
 Prof. W. K. H. Panofsky USA  
 Prof. R. E. Peierls UK  
 Sir William Penney UK  
 Prof. F. Perrin France  
 Dr. J. B. Phelps USA  
 Dr. W. H. Pickering USA  
 Prof. M. Pihl Denmark  
 Prof. H. Pose GDR  
 Prof. C. F. Powell UK  
 Dr. F. Press USA  
 Prof. M. H. L. Pryce UK  
 Prof. E. M. Purcell USA  
 Prof. I. I. Rabi USA  
 Prof. E. Rabinowitch USA  
 Dr. G. Randers Norway  
 Prof. A. Rich USA  
 Dr. J. Riznichenko USSR  
 Prof. J. Rotblat UK  
 Prof. S. Sakata Japan  
 Dr. O. Sala Brazil

Prof. A. Salam Pakistan  
 Prof. M. Sands USA  
 Prof. V. Sarabhai India  
 Prof. P. Savic Yugoslavia  
 Dr. T. E. W. Schumann South Africa  
 Prof. F. Seitz USA  
 Prof. W. Selove USA  
 Acad. D. V. Skobelzyn USSR  
 Prof. R. Steinmaurer Austria  
 Prof. I. Supek Yugoslavia  
 Prof. L. Szilard USA  
 Acad. I. E. Tamm USSR  
 Prof. H. Thirring Austria  
 Sir George Thomson UK  
 Prof. H. A. Tolhoek Netherlands  
 Dr. J. S. Toll USA  
 Prof. S. Tomonaga Japan  
 Prof. C. H. Townes USA  
 Prof. T. Toyoda Japan  
 Dr. V. S. Vavilov USSR  
 Prof. S. N. Vernov USSR  
 Prof. B. M. Vul USSR  
 Prof. D. Walker New Zealand  
 Dr. A. M. Weinberg USA  
 Prof. V. F. Weisskopf USA  
 Prof. C. F. von Weizsäcker FGR  
 Dr. H. Wergeland Norway  
 Prof. E. O. Wigner USA  
 Prof. K. A. Wolf FGR  
 Prof. H. C. Wolfe USA  
 Prof. H. Yukawa Japan  
 Prof. J. R. Zacharias USA

2. Chemistry (physical, inorganic,  
 organic and crystallography)

Prof. R. Bognar Hungary  
 Acad. R. Brdicka Czechoslovakia  
 Prof. C. Coryell USA  
 Prof. C. E. Dolman Canada  
 Acad. M. M. Dubinin USSR  
 Dr. T. Förland Norway  
 Prof. R. Gomer USA  
 Prof. Dorothy Hodgkin UK

† deceased



Acad. V. A. Kargin	USSR
Prof. G. Kistiakowski	USA
Prof. F. A. Long	USA
Dame Kathleen Lonsdale	UK
Prof. M. Magat	France
Dr. D. C. Martin	UK
Dr. C. Ouellet	Canada
Prof. L. Pauling	USA
Prof. P. Piganiol	France
Prof. J. C. Polanyi	Canada
Dr. J. A. K. Quartey	Ghana
Prof. G. Rienäcker	GDR
Prof. M. A. Sadovsky	USSR
Acad. N. N. Semenov	USSR
Acad. F. Sorm	Czechoslovakia
Acad. A. V. Topchiev†	USSR
Acad. A. P. Vinogradov	USSR

3. Technology (electronics and engineering)

Acad. A. A. Blagonravov	USSR
Acad. D. Dumitrescu	Rumania
Prof. W. S. Emelyanov	USSR
Dr. T. Gardner	USA
Acad. V. A. Kirillin	USSR
Acad. J. Kozesnik	Czechoslovakia
Acad. A. Kuhelj	Yugoslavia
Mr. R. S. Leghorn	USA
Sir Ben Lockspeiser	UK
Prof. W. Rosenblith	USA
Prof. H. Rumpf	FGR
Prof. P. Szulkin	Poland
Acad. A. N. Tupolev	USSR
Sir Robert Watson-Watt	USA
Prof. J. P. Wiesner	USA

4. Other (geography, oceanography, etc.)

Prof. I. S. Isakov	USSR
Dr. C. O' D. Iselin	USA
Prof. D. Kerr	Canada
Prof. G. Manley	UK
Prof. T. Raven	Lebanon
Prof. R. Revelle	USA

C. BIOLOGICAL AND MEDICAL SCIENCES

1. Biology (including microbiology, bacteriology and virology)

Mr. F. C. Bawden	UK
Prof. E. Boeri†	Italy
Dr. B. Commoner	USA
Dr. W. V. Consolazio	USA
Prof. S. Gard	Sweden
Sir Julian Huxley	UK
Acad. A. A. Imshenetsky	USSR
Dr. M. M. Kaplan	USA
Prof. O. Lindberg	Sweden
Prof. A. Lwoff	France
Prof. O. Maaløe	Denmark
Dr. P. von Magnus	Denmark
Acad. I. Malek	Czechoslovakia
Prof. H. Muench	USA
Prof. T. Rosebury	USA
Dr. A. B. Sabin	USA
Prof. A. A. Smorodintsev	USSR
Dr. W. Stefanski	Poland
Prof. M. G. P. Stoker	UK
Dr. P. Thibault	France

2. Biochemistry and Physiology

Prof. E. J. Conway	Ireland
Prof. P. Doty	USA
Prof. J. T. Edsall	USA
Prof. R. M. Herriott	USA
Prof. C. D. Leake	USA
Sir Rudolph Peters	UK
Mr. N. W. Pirie	UK
Prof. M. Sela	Israel
Acad. N. M. Sissakyan	USSR
Prof. F. B. Straub	Hungary

3. Medicine and Pathology

Dr. M. L. Ahuja	India
Dr. B. Dimissianos	Greece
Prof. G. Favilli	Italy
Sir Howard Florey	UK
Dr. A. Gros	France
Prof. A. Hadow	UK

† deceased



Dr. C.C. Higgins	USA
Acad. I. Rusznyak	Hungary
4. <u>Radiobiology</u>	
Acad. D. Kanazir	Yugoslavia
Prof. A.M. Kuzin	USSR
Prof. A.M.B. Lacassagne	France
Dr. Patricia J. Lindop	UK
Dr. H. Marcovich	France
Dr. J. Read	New Zealand
Dr. L. Revesz	Sweden
Dr. S. Vatistas	Greece
5. <u>Genetics</u>	
Prof. A.A. Buzzati-Traverso	Italy
Prof. B. Glass	USA
Dr. H. Hoagland	USA
Dr. W.E. Kerr	Brazil
Prof. F. Mainx	Austria
Prof. M. Meselson	USA
Prof. H.J. Muller	USA
Prof. C. Pavan	Brazil
Prof. C.H. Waddington	UK
6. <u>Psychology and Psychiatry</u>	
Dr. Viola W. Bernard	USA
Dr. B.G. Chisholm	Canada
Prof. J. Cohen	UK
Dr. J.D. Frank	USA
Dr. O. Gunnarsson	Iceland
Dr. O. Klineberg	USA
Dr. P. Valkenburgh	Netherlands
7. <u>Other subjects (anthropology, botany and nutrition)</u>	
Lord Boyd-Orr	UK
Dr. H. Boyko	Israel
Dr. Margaret Mead	USA
Dr. S.R. Morcos	Egypt, UAR
Dr. J. Yanney-Wilson	Ghana

## D. SOCIAL SCIENCES

1. <u>Economics (including political economy)</u>	
Acad. A.A. Arzumanjan	USSR
Prof. K.E. Boulding	USA
Prof. D. Calic	Yugoslavia
Prof. Chang-Wei	China
Sir John Crawford	Australia
Mr. G. Gueron	France
Prof. W. Leontief	USA
Prof. W.W. Rostow	USA
Prof. M. Rubinstein	USSR
Dr. E. Staley	USA
Dr. L. Urban	Czechoslovakia
2. <u>History</u>	
Prof. G. Fisher	USA
Prof. M. Howard	UK
Prof. V. Husa	Czechoslovakia
Prof. V.M. Khvostov	USSR
Dr. S.G.T. Korneev	USSR
Acad. K. Kumaniecki	Poland
Acad. J. Macek	Czechoslovakia
Dr. G. Piel	USA
Prof. N.A. Talensky	USSR
3. <u>Law</u>	
Mr. H. Afheldt	FGR
Acad. M. Bartos	Yugoslavia
Dr. D.F. Cavers	USA
Prof. R. Fisher	USA
Acad. V. Knapp	Czechoslovakia
Prof. V. Kopal	Czechoslovakia
Prof. E.A. Korovin	USSR
Prof. I.J. Kozhevnikov	USSR
Prof. L. Lipson	USA
Prof. E. Menzel	FGR
Acad. V. Prochazka	Czechoslovakia
Prof. B.V.A. Röling	Netherlands
Prof. L.B. Sohn	USA
Dr. J. Spingarn	USA



4. International Relations

Dr. N. I. Bazanov	USSR
Dr. G. P. Besedin	USSR
Prof. R. R. Bowie	USA
Dr. J. W. Burton	Australia
Prof. R. Calder	UK
Prof. N. N. Inozemtsev	USSR
Prof. K. Lapter	Poland
Dr. L. Mates	Yugoslavia
Mr. T. Nemec	Czechoslovakia
Mr. V. P. Pavlichenko	USSR
Prof. T. C. Schelling	USA
Prof. M. Shulman	USA

5. Politics and Sociology

Mr. A. Buchan	UK
Prof. M. Grodzins	USA
Prof. H. A. Kissinger	USA
Prof. J. D. B. Miller	Australia
Mr. J. Moch	France
Mr. P. Noel-Baker	UK
Prof. E. Shils	USA
Mr. G. H. Slotemaker	Netherlands
de Bruine	
Mr. Feng Ping-Fu	China
Mr. W. Young	UK

Summary

	<u>Numbers in each</u>		<u>Percentage</u>
	<u>group</u>	<u>section</u>	
A. <u>Philosophy and Mathematics</u>			
1. Philosophy	6		
2. Mathematics	<u>8</u>	14	5
B. <u>Physical Sciences</u>			
1. Physics	128		
2. Chemistry	25		
3. Technology	15		
4. Other	<u>6</u>	174	56
C. <u>Biological and Medical Sciences</u>			
1. Biology	20		
2. Biochemistry and Physiology	10		
3. Medicine and Pathology	8		
4. Radiobiology	8		
5. Genetics	9		
6. Psychology and Psychiatry	7		
7. Other	<u>5</u>	67	21
D. <u>Social Sciences</u>			
1. Economics	11		
2. History	9		
3. Law	14		
4. International Relations	12		
5. Politics and Sociology	<u>10</u>	<u>56</u>	<u>18</u>
	Total	311	100



## CLASSIFICATION OF PARTICIPANTS IN THE PUGWASH CONFERENCES

### II. BY COUNTRIES

Australia	4	Japan	7
Austria	4	Lebanon	1
Brazil	4	Malaya	1
Bulgaria	1	Netherlands	7
Canada	7	New Zealand	2
China	4	Nigeria	1
Czechoslovakia	11	Norway	3
Denmark	4	Pakistan	1
Federal German Republic	13	Poland	6
France	14	Rumania	2
German Democratic Republic	3	South Africa	1
Ghana	3	Spain	1
Greece	2	Sweden	5
Hungary	5	Switzerland	3
Iceland	1	U. A. R.	1
India	6	U. K.	40
Ireland	1	U. S. A.	88
Israel	2	U. S. S. R.	39
Italy	6	Yugoslavia	7

N. B. In addition to the 311 participants there were 52 observers in the eleven Pugwash Conferences held up to now. They came from 13 countries and two U.N. Agencies. The classification of the observers by profession does not differ significantly from that of the participants.

### PROCEEDINGS OF THE ELEVENTH CONFERENCE

The Proceedings of the Eleventh Pugwash Conference held last September in Dubrovnik are being circulated to the participants of past Conferences at the same time as this issue of the Newsletter. The preparation of both was again made possible by the generosity of Mr. Ellis Stanning, Chairman of Lloyd's Pharmaceuticals, London, to whom we express our gratitude.



## NATIONAL PUGWASH GROUPS

### "VEREINIGUNG DEUTSCHER WISSENSCHAFTLER" (ASSOCIATION OF GERMAN SCIENTISTS)

On 1st October 1959, during the Conference of the Societies of German Physicists at Berlin, the Association of German Scientists was founded. The inspiration for this foundation came from Born, Burkhardt, Hahn, Kliefoth, von Laue, von Weizsäcker and Wolf. The first president of the Association was Professor Hans Kopfermann of Heidelberg.

The programme of the Association is mainly concerned with the handling of two groups of problems:

1. Questions relating to war and peace in the age of nuclear energy.
2. The questions of "technical progress", i. e. how to prevent everything that can be achieved on technical grounds from being implemented and praised as progress just for the reason that it is technically possible - without sufficiently investigating its advantages and disadvantages for the community as a whole (e. g. the pollution of air, lakes and rivers; noise from traffic on roads and in the air).

The programme referred to the Frank-Report, the efforts of the Federation of American Scientists and the work of the Pugwash Conferences as models and examples for the collaboration of scientists in studying such problems.

Today the Vereinigung Deutscher Wissenschaftler (VDW) has 149 members. Approximately half of them are natural scientists. After Hans Kopfermann's death, Gerd Burkhardt, professor of theoretical physics at Hannover, was elected president.

The managing board is assisted by a Working Committee with 13 members. This Committee meets several times a year to plan and discuss the further activities of the VDW.

Once a year a general meeting of the members of the Association is held at Marburg/Lahn, a small but centrally situated university town in the Federal Republic.

#### Work achieved by the VDW until now.

The Association began its activity by informing its own members; for this purpose it issued a "Circular Letter". Apart from information the "Circular Letter" is intended for the preparation and continuation of the activities of the Association.

The following were some of the topics dealt with in the Letters:

- Reports on the Pugwash Conferences
- Arms control and arms limitation
- Economic consequences of radical disarmament
- Nuclear Tests and International Law
- Protection of civil population
- Non-violent resistance

Apart from this the letters propagated and thus helped to establish a series of lectures at German universities arranged for the creation of understanding of the responsibilities of scientists in modern society. At some universities (Hamburg, Hannover) these lectures have grown into permanent institutions.

Among the topics of these lectures were:

- Problems of nuclear energy in modern science and technology
- Effects of civilization on society
- The future of educational institutions in the technical age
- Defence, deterrence, disarmament
- Non-violent resistance
- Prejudices
- The role of scientists in society
- The rule of experts - problems of technocracy
- Utopia in history



At the annual general meetings the Working Committee suggests the formation of commissions for handling special problems. Such a suggestion is usually preceded by a lecture introducing the specific problem which the commission should work on. The commissions thus established report to the next annual general meetings the results of their work.

At present there are commissions for the following questions:

- Presuppositions for the establishment of an institute for problems on security and disarmament
- Protection of civil population
- The legislation for a state of emergency
- The consequences of a war in Central Europe
- Security policies in Central Europe
- High treason and the reform of Criminal Law
- Nuclear weapons and International Law

The conclusions of the Commission for the "Protection of civil population" were published as a "Memorandum" under the title "Ziviler Bevölkerungsschutz heute" (Protection of Civil Population Today) by Mittler & Sohn, Frankfurt/Main. Recently a second enlarged edition was printed containing a critical review of the relevant Bills submitted by the Federal Government.

We have the impression that we succeeded well in correcting false

opinions about the possibilities and limitations of protecting the civil population. It appears that as a result of the Memorandum there is no longer any doubt in public discussion that the West German population cannot be protected if a big power wants, or at least does not mind, its annihilation.

The opinion of the Association regarding the Bills referring to a state of emergency has been published in October under the title "The Permanent State of Emergency" (published by Vandenhoeck & Ruprecht, Göttingen). We believe that this Memorandum will help to demonstrate the problems of legislation for a state of emergency.

The work of the Pugwash groups not only helped at the occasion of the establishment of VDW, but even afterwards the Association received many inspirations from the Pugwash groups. The VDW has, of course, to deal also with problems of a more national character, which are outside the scope of the Pugwash activities. But there are close links, especially of a personal kind, since some of the most active members of the Association take part in the Pugwash Conferences. Besides, those studies of the VDW which have mainly to do with domestic politics also contribute to building a peaceful order of the world.

H. Afheldt

Canadian Peace Research Institute

#### PEACE RESEARCH ABSTRACTS

Papers on peace and war are now being published in every journal from those dealing with astronomy to those on zoology as well as in specialized journals. In addition much is also being published in popular magazines. It is

not physically possible for one man to read all of the material which is being published let alone all that has been published since 1945. Until recently no single abstracting organization was even attempting to make abstracts of all



papers published in the field of war and peace in every language and in every branch of knowledge.

The first project of the Canadian Peace Research Institute was Peace Research Abstracts (PRA). PRA has as its goal complete coverage of the literature in all languages from 1945 to the present. In October 1963 PRA had 8,000 references of which 5,500 had abstracts. These abstracts have been obtained from about 600 journals in several languages. The task of abstracting the journals of the world is a formidable one but the co-operation of scientists in 15 countries has already been obtained. More volunteer abstractors are, however, still urgently needed.

The intention of any set of abstracts is to give the literature searcher references to relevant work which has been published and to give him an abstract sufficiently detailed that he knows whether or not he should bother to consult the original publication.

The abstracts obtained by PRA are put onto hand-sorted punched-cards so that information can be quickly retrieved from the collection. Due to this feature PRA has been able to give answers rapidly to such questions as:

- "What has been published on disarmament plans - both government proposals and suggestions from individuals?"
- "What articles have been written on the administration and efficacy of economic assistance to under-developed countries?"
- "What has been written on United Nations Police Forces?"
- "What attitude surveys have been done on the question of civil defence?"
- "What has been published on world government?"
- "What has been written on the history of disarmament and test-ban negotiations?"

The field of interest has been divided into 10 major categories and then further subdivided into 1,000 fine classifications of which only 330 have been utilized so far. The classification scheme has been described in the Peace Research Abstracts Coding Manual which can be obtained by sending \$1.00 to the address given below.

Peace Research Abstracts can be used now by scholars anywhere in the world; such persons should obtain a Coding Manual and then request that a search be made; it helps if the searcher orders his search in our code rather than in words and if he tells PRA something about the type of work which he is doing. The abstracts obtained as a result of such a search are photostated. The cost of a search is only \$10.00 per searching hour and 9 cents per abstract for photostating.

Duplicate sets of Peace Research Abstracts will be printed and punched. Both hand-sorted and machine-sorted punched-cards will be printed and will sell at 3 and 6 cents per card respectively. All of the interest shown so far has been in the hand-sorted cards; the charge of 3 cents per card barely covers the cost of the paper and ink; we have made the assumption that subsidies will be obtained to pay for all other costs. Twelve thousand cards will be issued a year and thus the yearly cost will be \$360.00; the cards will be issued at the rate of 1,000 per month.

Persons interested in working as volunteer abstractors, in using the Searching Service or in indicating their interest in ordering their own copies of Peace Research Abstracts when they are printed should write to:

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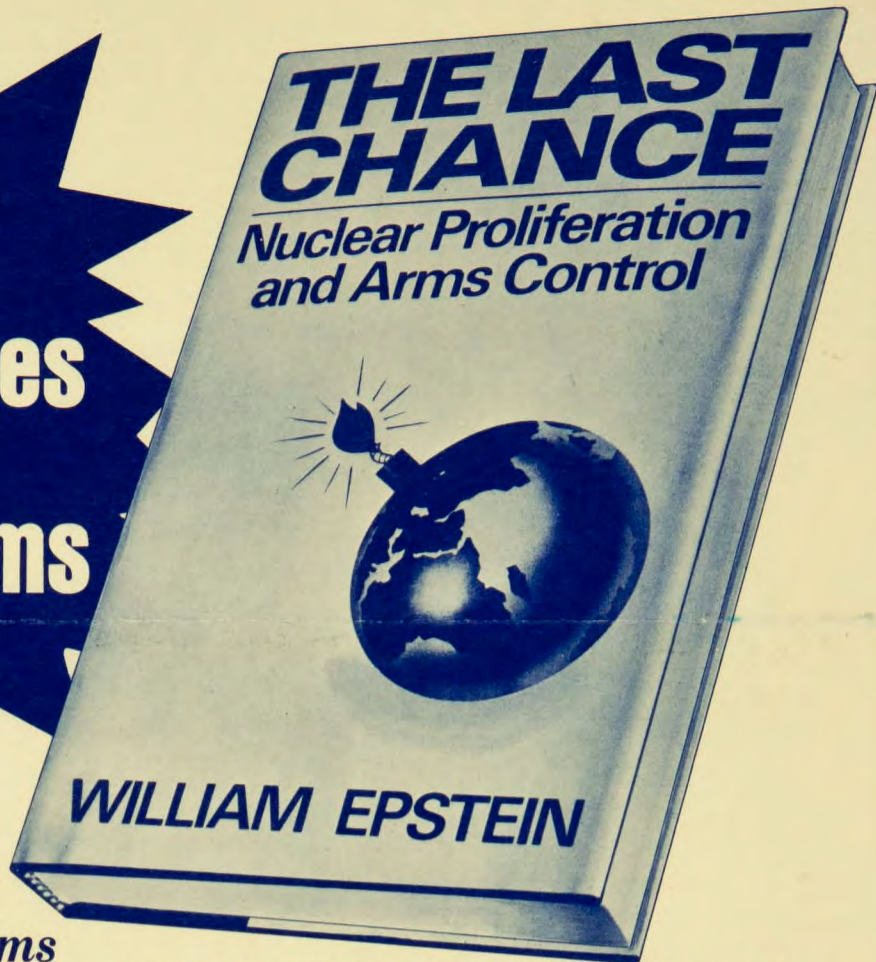




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**An Alarmed Authority Offers Guidelines to Control the Nuclear Arms Race!**



*“For the first time in a quarter of a century of working with the problems of the arms race, I am beginning to get scared,”*

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**THE LAST CHANCE** is not a “doomsday” book. It provides a basic history of the proliferation of nuclear

arms and the attempts to control it, and offers a penetrating analysis of the dilemma the arms race poses to world security. Most importantly, Epstein makes some expert proposals for strengthening the forces of non-proliferation:

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- \* Far-reaching ways to create the proper world political climate for non-proliferation.

**THE LAST CHANCE** clearly explains what must be done *now* to stop the race for nuclear weapons which threatens the future of humanity.

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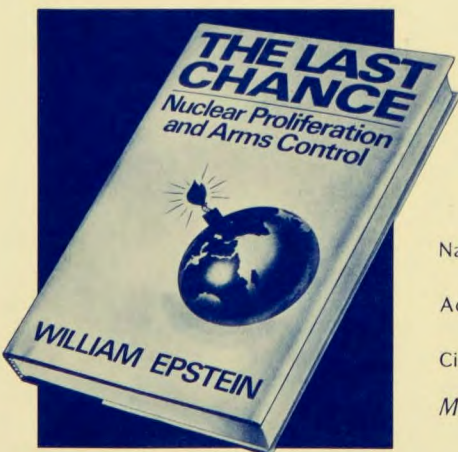
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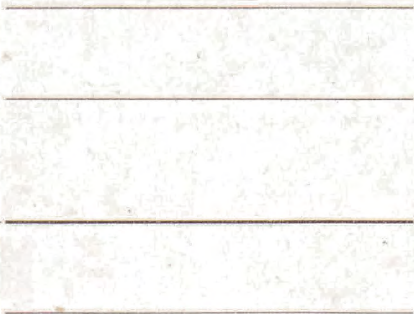




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Akademie der Wissenschaften der DDR

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~~Herrn~~/Frau Dr. Gertrud Weiss Szilard

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