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Reports of the Pugwash Conferences, Symposia and Workshops represent the views of the individuals attending a particular meeting. Occasionally, the Pugwash Council or its Executive Committee issues official statements on behalf of Pugwash.

THE BANFF EXPERIENCE

The bare statistics are 133 participants from 40 countries, 8 observers from international organizations, 16 guests, (mainly Canadian governmental authorities) and 13 student assistants - a somewhat larger than usual Conference. May the sacrificed trees forgive us for the amount of paper required, another international demonstration of the xerox analogy with DNA replication. How does one evaluate such an expenditure of funds, time, human energy and natural resources?

We must acknowledge at once the unstinting generosity of several financial backers, governmental and private, mobilized by the Canadian Pugwash Group headed by the untiring Bill Epstein. The effective local organization could not have been accomplished without some minor hitches, but these were blotted out by the successful private and public sessions and the fine excursion (except for the weather) to the Columbia ice fields.

Successful in what sense? The expertise of the participants assured illuminating discussions on prickly issues, with a resultant mutually educational effect and understanding of often widely opposing viewpoints. Consensus was reached on important issues for transmission to governmental authorities and the public (see Council statement p.50), and the Conference received wide coverage in the media. We cannot of course measure the impact of these efforts, but the above purposes of a Pugwash Conference were certainly achieved. Whether and how such purposes should be modified for the future remains to be decided in Warsaw next year.

A negative note was struck just prior to the opening of the Conference. This concerned the refusal of the Canadian Government to issue visas on 'security' grounds to two invited participants, despite strenuous efforts of our President and Council to reverse the decision. This unwelcome precedent was long debated by Council before deciding to proceed with the Conference, and to register a public protest at the end of the official opening (p.56). Had there been more advance notice of the refusal, the Council would very likely have decided to cancel the Conference. But with most of the participants already in Banff, the Council decided against such a drastic step, one which is now the established policy of several international scientific organizations. The term 'security' as now often used by governmental officials extends from the justification for more arms to any presumed threat, however remote and lacking in credibility as in this instance. The Council cabled its regrets to the two persons concerned. Let us hope that such a situation will not recur.

We now face a busy year before the quinquennial Conference in Warsaw (see Calendar p.95). Apart from an Executive Committee meeting in mid-December, the full Council will meet in February 1982, and the Warsaw Conference will occupy a major part of their time. They will need guidance from the national groups and Pugwashites at large on issues of our organization and functions for the five years after Warsaw. You are urged to give thought to these matters (see, for example, the July 1981 issue of the Newsletter), and to submit your views to our Central Office.

M.M.K.

STATEMENT FROM THE COUNCIL ON THE 31ST PUGWASH CONFERENCE
HELD IN BANFF, ALBERTA, CANADA, 28 AUGUST to 2 SEPTEMBER 1981

The 31st Pugwash Conference was held in Banff, Alberta, Canada, from 28th August to 2nd September 1981. The theme of the Conference was "The Search for Peace in a World in Crisis". The Conference was attended by 133 participants from 40 countries, plus 26 observers and 13 students. The Government of Canada and of the Province of Alberta, the United Nations and its specialized agencies UNESCO and WHO, the Royal Society of Canada, and other organizations were represented. The Conference was opened by a statement from Prime Minister Pierre Elliott Trudeau, delivered by Ambassador Arthur Menzies, and an address was given at the closing session by Gerald Regan, Minister of Labour in the Federal Government.

A public session, convened by the Canadian Pugwash Group in connection with the Conference, was held in Calgary on August 30th. The meeting was addressed by Academician Georgi Arbatov, member of the Central Committee of the USSR, Olof Palme, former Prime Minister of Sweden, Senator Charles Percy, Chairman of the Foreign Relations Committee of the United States Senate, and Paul Warnke, former Director of the United States Arms Control and Disarmament Agency.

Six Working Groups were convened to discuss the following topics:

1. Avoiding Nuclear War
2. Avoiding Conventional War
3. Negotiating Arms Limitation and Disarmament
4. Enhancing International Security
5. Energy, Resources and International Security
6. Security in the Developing World

The Pugwash Council presents the following statement, based on the reports of the Working Groups.

Avoiding Nuclear War

Since the last Pugwash Conference the nuclear arms race has become still more savage. SALT II has not been ratified. The whole SALT process has been interrupted. Other nuclear disarmament negotiations have stopped completely or are at an impasse. Ominous suggestions have been made to rescind agreements of the 'seventies including the ABM Treaty and other elements of SALT, and there have been threatened withdrawals from the non-proliferation treaty (NPT).

It is essential to reverse this trend.

Nuclear Weapons Doctrine

While recognizing the fact of mutual deterrence with respect to the central strategic systems of the US and the USSR, the tendency to extend nuclear deterrence beyond its role in that area was strongly criticized. It is a fallacy to believe that nuclear war can be won. It was widely felt that the leaders of the nuclear powers should explicitly deny military doctrines which legitimize limited nuclear warfare. The Soviet and American governments should reaffirm their intention to maintain equal security at more stable and lower force levels.

A Nuclear Weapons Freeze

Since rough parity is widely acknowledged, an immediate freeze of the current nuclear arsenals of the US and the USSR is recommended as an effective step towards nuclear disarmament. Implementation of a freeze should be followed by substantial weapons reductions. Such a freeze could be initiated as a mutual moratorium on new weapons deployments, and should be rapidly reinforced by formal agreements on weapons production and testing, a comprehensive nuclear test ban and a cut-off in the production of fissile material for weapons purposes. These elements of the Canadian "strategy of suffocation of the nuclear arms race", as well as George Kennan's recent proposal to cut nuclear forces by 50% were endorsed by many participants.

Priorities for Nuclear Weapons Negotiations

With respect to Soviet-American agreements Pugwash urges retention of the ABM Treaty and immediate ratification of SALT II. Meanwhile all positive elements of the negotiations achieved so far should be maintained and the Soviet Union and the United States should continue to refrain from actions which could jeopardize the SALT agreements. Pugwash noted the continued smooth functioning of the SALT Standing Consultative Commission but urged that SALT, talks on the CTB, and other deadlocked negotiations should be resumed at the earliest opportunity.

Many considered that priority should be given to the limitation and reduction of systems that are particularly destabilizing. These include accurate intercontinental and intermediate ballistic missiles with countersilo capabilities, cruise missiles, anti-satellite systems, ballistic missile defence and anti-submarine weapons (ASW). Submarine sanctuaries free of ASW deployments were proposed as a means to stabilize sea-based deterrence.

Nuclear Weapons in Europe

It is essential that serious negotiations on limiting nuclear weapons in Europe begin soon, before it is too late to set low limits. A freeze of the kind mentioned above might facilitate these talks.

It was pointed out by many that the deployment of medium and intermediate range nuclear missiles should be eliminated, preferably by mutual agreement if not unilaterally. Reference was made to the suggestion that the USSR dismantle its SS-20 missiles and the USA not deploy the Pershing II and cruise missiles envisaged in the 1979 NATO double decision. Some stressed that this was unbalanced and that non-deployment of US new weapons should not be coupled with certain reductions of existing Soviet medium range weapons only; USA forward-based systems and other elements of existing nuclear potential should be involved as well.

A proposal was made to eliminate by agreement or unilateral action all kinds of battle-field nuclear arms in Europe of range less than about 100 km. Their withdrawal, possibly together with a prohibition of their first use, would exclude deployment of neutron weapons, raise the threshold of nuclear warfare and so increase stability.

The UN and Disarmament

The Final Document of the 1978 United Nations Special Session on Disarmament, which is an outstanding document, in fact remains a dead letter. Governments are urged to prepare carefully for the second UNSSOD scheduled for June 1982, in particular

to seek binding force for any disagreement provisions agreed to by the General Assembly.

Recent withdrawals from Eastern Europe of 1000 Soviet tanks and troops, and from Western Europe of 1000 US nuclear warheads, suggest that independent initiatives are as important as formal agreements in achieving disarmament objectives. We suggest that nuclear weapon powers offer programmes to the UN which set out schedules of weapons reductions they would be prepared to undertake independently.

Creating Conditions Favourable to Disarmament

The observance by Governments of their obligations under the UN Charter not to use force is a necessary condition of an effective system of arms limitation. Disarmament and arms control should not however be linked with specific problems relating to local conflicts. Effective restraint on arms transfers to areas of military confrontation in the Middle East, Africa, Latin America and Asia is needed if conditions favourable to disarmament are to be created.

Mobilizing Public Support for Disarmament

We support recent proposals for a committee of distinguished scientists to analyse and make known the dangers of nuclear war.

In addition we will seek to make the expertise of our members available to the many new groups working to mobilize public opinion for disarmament.

Avoiding Conventional War

This problem is inextricably intertwined with the problem of avoiding nuclear war, particularly in those regions where nuclear weapons are stockpiled on both sides. How these regions could be denuclearized without endangering stability and security was discussed. The nuclear powers are often directly or indirectly involved in conventional wars and the prospects for denuclearization of any area are affected by the concerns of the major powers regarding a confrontation of conventional armaments once nuclear weapons are eliminated. It was recognized that the requirement of stability after denuclearization will demand a reassessment of the conventional armaments and forces in those regions.

We also noted with concern the tendency for the areas of confrontation and military proximity between the major powers to be increasingly extended into the Third World.

It was proposed that special agreements to reinforce the universal principle of non-intervention be concluded concerning crisis regions in which major powers are involved. Agreement among member states of the region as well as of the major powers would be required. **Guarantees** by all concerned should be given for denuclearization, control over arms sales, peaceful settlement of disputes, and regional cooperation including multilateral aid.

Our final goal is disarmament. In the process of trying to reach this goal, as a means of stabilizing peace and discouraging aggression, defensive arms should be emphasized.

It was also suggested that the principle of priority of defensive forces should be taken into consideration in the continuing Mutual and Balanced Force Reduction (MBFR)

talks in Vienna.

Unilateral steps in arms reduction and in withdrawal of forces, taking into account the requirements of mutual stability and security, were recommended as a means of accelerating the negotiating process.

It was felt that, as an overall objective, a broader exchange of information on military activities and on doctrines and matters related to mutual security and to intentions concerning the use of existing and planned armaments, would avoid worst-case scenarios and arms races, and would decrease mistrust among states and their peoples.

Governments are urged to curb the arms trade by general or regional agreements. The international arms market should be brought under control by all available means.

Enhancing International Security

The enhancement of mutual security is a necessary prerequisite to strengthening the arms control process and taking steps towards disarmament.

Internationally the role of the UN in conflict control and conflict resolution is central, but its effectiveness depends on clearly distinguishing between the political activities of the Security Council and General Assembly and the impartial use of the good offices of the Secretary-General to establish peacekeeping operations, set up observer missions or intervene between conflicting parties. Strong support was urged for a special session of the UN General Assembly on International Security to consider all aspects of this question. It was suggested that an international satellite monitoring system managed by a consortium of countries with a degree of autonomy could be advantageous to the UN as an alternative source of information for the prevention and management of crises and especially for the verification of future disarmament and arms control agreements.

In negotiations to resolve international disputes the universally accepted principles of human rights must be repeated. The full implementation of the provisions of the UN Covenants on Human Rights and of the relevant clauses in the Helsinki Final Act is an important part of the process of enhancing international security. The right to survive is the overriding priority.

Mechanisms such as the Standing Consultative Commission for the monitoring of SALT agreements are likely to be essential in future arms control agreements in order to ensure technical implementation, and to help to remove ambiguities and thus generate mutual confidence. Increasing the scope of the confidence building measures initiated in the Helsinki Final Act is an urgent necessity. Regional arms control agreements, including nuclear weapon free zones, such as those proposed for the Arctic, Northern and Central Europe, the Balkans and the Middle East, need urgent consideration.

We believe that popular reactions to developments such as the neutron bomb should be channelled into opposition to all nuclear weapons and to war generally.

It is also important to create understanding, for example, by organizing frank discussions on the psychological aspects of international security.

Security in the Developing World

Over the past year there has been a deepening sense of insecurity and of a world-wide fear of a nuclear war. Security may be a legitimate concept (at least as long as the concept and practice of nations-states persist) or it may become an excuse for internal power and domination by small ruling groups through the use of force. Perceived insecurity may spring from many factors, such as economic conditions, competition for strategic resources, ethnic and religious domestic struggles. All these factors may be manipulated in the world struggle of opposing ideologies for power, leading to the acceleration of arms trade and the concomitant militarization of the Third World.

The investment in arms is non-productive and diverts badly needed resources from a nation's capacity to meet human needs and for development.

Nuclear proliferation provides a frightening dimension to the problem of security in the developing world, where the decision to make a nuclear first-strike may be encouraged by the lack of a credible deterrent in an opposing nation. To prevent proliferation, the NPT should be signed by all nations of the world; the nuclear super-powers should demonstrate by their own actions their willingness to reduce their nuclear arsenals and restore detente; International Atomic Energy Agency (IAEA) safeguard measures should be strengthened to make them more credible; nuclear suppliers should see to it that materials and technological knowhow are not diverted from civilian to military purposes; nations, the UN and Pugwash should carefully study the proposal that the enrichment, fuel processing and reprocessing plants should be operated internationally under safeguards of an international agency.

Militarism, both in developed and less developed countries, should be rejected under its two guises: (1) as military regimes where power is in the hands of soldiers, resulting in the repression of dissenting groups in order to assure that political power remains in the hands of a ruling minority; and (2) in the form of military-industrial complexes and pressure groups whose financial and political interest, even in civilian regimes, are related to the perpetuation of international conflicts.

Energy, Resources, and International Security

Interactions between energy and international security are manifold: international tensions and conflicts can disrupt the production and supply of energy; energy problems can influence the likelihood and severity of international conflicts, and may even be their root causes; energy may serve as the proximate cause of conflicts; and, finally, energy problems and policies can serve as the means of conflict. Three specific energy-conflict linkages are of particular importance at this time: the rich-poor gap in energy, the overdependence of many nations on a few geographically concentrated oversupplies of hydrocarbons, and the links between nuclear fission power technology and the potential for accelerated spread of nuclear weaponry to an ever larger number of nations.

Given the very uneven utilization of energy throughout the world, conflicts over access to energy resources by industrial countries and the severity of the difficulties in overcoming energy problems in developing countries, energy policies of individual countries should be incorporated within comprehensive development plans and should be based upon the use of various mixes of energy resources. While increased efficiency is the fastest and the cheapest way to reduce vulnerability to energy shortages, particularly in industrial countries, it must be kept in mind that the magnitude of

technically recoverable energy resources is greater than often envisaged. It applies particularly to smaller deposits of oil and gas, heavy oils and tar sands and coal. A prudent degree of development of unconventional fossil-fuel resources can contribute to reduced vulnerability to both energy shortages and fluctuations in prices and thus reduce international energy conflicts. Increased energy supply can also go a long way toward reducing some of the energy-related threats to international security.

Ultimately, a global 'compact' of internationally agreed arrangements governing the development, supply, utilization and financing of energy would enable the world's energy needs to be met in ways most compatible with economic, social, environmental and security considerations. Because oil prices continue to be a large factor in planning and decisions in respect to alternative sources for importers, and in national economic planning for exporters, international agreements facilitating greater stability and predictability of oil prices in conjunction with essential commodities, such as food, would contribute to world economic stability and hence to security.

Concrete measures were suggested for helping to implement such international strategy including, among others:

the establishment of a World Energy Organization as a specialized UN agency;

the creation of an international consultative group for the mobilization and coordination of an increased flow of financial and technical sources to developing countries for development of new local energy resources ;

the setting up of a 'world energy information system' to support technically the national energy planning in developing countries ;

the creation of appropriate institutions for providing necessary capital for energy development in the developing countries ;

a collective action in the energy development field by oil-exporting and oil-importing developing countries;

the promotion of the integrated development of international river basins; and

the resumption of the international dialogue aimed at the internationalization of the nuclear fuel cycle, based upon the policy of complete 'openness' of all operating facilities.

* * * * *

The Pugwash Council deplores the use of military force by Israel against the experimental Iraqi nuclear reactor, whatever Israel's perception of a threat to its security. We oppose in general the use of military force to settle questions for which peaceful solutions must be sought. The Council urges on all the governments concerned to act on the proposal for a Nuclear Weapons Free Zone in the Middle East and to put their nuclear facilities under international surveillance and control.

STATEMENT ON REFUSAL OF VISAS TO PUGWASH INVITEES
ISSUED BY THE PUGWASH COUNCIL ON 28 AUGUST 1981

Twenty four years ago a meeting was held at Pugwash, Nova Scotia at the invitation of Mr. Cyrus Eaton to bring together scientists from the East and West. It was called in response to an appeal by Bertrand Russell and Albert Einstein to try to avert any further use of nuclear bombs. For thirty Pugwash Conferences held throughout the world all invited scientists and experts were issued with visas from the host country. This year, for the first time, visas have been refused to two invited participants, one of whom was present at the first Conference in Canada, and at many subsequent meetings. It is clear that the suspicion and distrust which existed in 1957, which our meetings have always tried to dispel, still exists, even in a country as open, friendly and generous as Canada. We hold it as an essential principle of our Movement that people should be able to meet who hold different opinions, come from different backgrounds and have different experiences. We regard the exclusion of individuals whose presence we have invited as a breach of this principle against which we most strongly protest. We propose to discuss the present situation further, later in this Conference. In the meantime we should like to emphasize that this situation makes it clear that Pugwash meetings are more urgently needed than ever before if nuclear war is to be averted and peace secured.

Supplementary Information

The two experts to whom visas were refused were:

- Dr. Vladimir Pavlichenko - Organizing Secretary of the Soviet Pugwash Committee; Member of the staff of the Presidium of the Soviet Academy of Sciences; a participant in the SALT II negotiations in Geneva.
- Dr. Vladimir Ustinov - Doctor of History of Science, specialist in problems of disarmament, a newcomer to Pugwash meetings.

We were informed that the refusal of visas was based on grounds of security, of which we have no knowledge. We do not accept security considerations as a valid reason for excluding individuals from our Conference which aims to bring together scientists of opposing views from East, West, North and South. In particular, we have found Dr. Pavlichenko very useful in our private and unofficial discussions over many years. We still hope that it may be possible for the visas to be granted.

REPORT OF THE DIRECTOR-GENERAL

The act of Pugwash's immaculate conception occurred some 25 years ago in this country, although at quite a distance from where we are meeting today. If we were to follow Chinese custom, we would be celebrating our silver anniversary at this Conference. As we shall abide by the usual rule of recording age, let us await next year's Conference in Warsaw before celebrating our survival for a quarter of a century.

It is pleasant to note in introducing this report that we sometimes receive public recognition for our collective efforts. This year Pugwash received an award - a statuette and diploma - for its contributions towards peace. The award was presented by the Umberto Biancomano European Prize Foundation of Milan. Other Biancomano laureates this year for work in their respective fields include Alfred Kastler, our Pugwash colleague and Nobelist in Physics, Max Bill, noted Swiss architect and artist, and Gaston Thorn, President of the European Economic Community.

I shall now briefly review what we have accomplished during the past year. Much of this information has been recorded in the Newsletter, to which I refer you for further details.

Meetings between the 1980 and 1981 Conferences

The Newsletter contains full accounts of the extraordinarily heavy schedule of seven symposia and workshops we have held since the Conference one year ago. In this report I shall therefore only touch on these meetings.

Workshop on Averting Nuclear War: the Role of the Media, Bad Deutsch-Altenburg, Austria, 11 and 12 October 1980

In some respects this meeting was a follow-up of the workshop we held in December 1978 on Crisis Management where we discussed in part the importance of the media in influencing the outcome of periodic crises which occur. In the October 1980 meeting, 27 participants including scientists, journalists, science writers, and representatives of television services focussed on the current crises in Europe and in the Third World. Engelbert Broda and his colleagues, with the full support of Chancellor Kreisky, again undertook to provide fine Austrian hospitality, as they have done several times in the past for Pugwash meetings. In the course of a review of current tensions and conflicts, media representatives pointed out that unbiased reporting of events in the press could be assured only if they had access to locales of conflict, and to reliable scientific sources for technical information instead of relying on often misleading news handouts from official government sources. Because of the importance of the subject and the undoubted usefulness of the meeting, a second workshop will be held in Geneva this coming December in which greater emphasis will be given to the role of television in averting nuclear war.

Third and Fourth Workshops on Nuclear Forces Deployment in Europe, Geneva, Switzerland, 6 and 7 December 1980, and 23 and 24 May 1981

These meetings were a continuation of the series first started in January 1980. In a time of freeze in international negotiations, the third and fourth meetings provided opportunities to maintain a private dialogue between opposing sides for exploring ways to halt and reverse the deployment of nuclear forces in Europe, and its linkages with the SALT process. Important and novel suggestions emerged from these meetings, for example, a moratorium which would maintain the status quo before and during negotiations, and unilateral and unconditional initiatives for halts to production and deployment of particularly destabilizing weapons (e.g., cruise missiles, SS-20) along with

specified time limits for reciprocal actions. These suggestions have had an impact on both unofficial and official thinking on this problem, although clearly little visible progress has been made in the attempts to solve it. We are therefore scheduling a fifth workshop for December, because even if the hoped for official negotiations get underway, they will be protracted and rigid in nature, and Pugwash can continue to make its contribution through private and uninhibited exchanges of views. This series of workshops has been made possible through the financial support of the Swiss Association of the Friends of Pugwash, through its Executive Committee - Jean Comina, René Curti, Jean-Francois Rochette, H. Dudley Wright and Michael Wyler.

36th Pugwash Symposium: "New Weapons Systems and Criteria for Evaluating their Dangers", London, 10 to 12 December 1980

Thirty-one experts attended this symposium, and the working papers and results of the meeting will be published as a Pugwash monograph. Discussions paid particular attention to destabilizing weapons under development for use in space, in the seas and on land, and their impact on efforts at arms control. In conjunction with the symposium, a public meeting was organized by the British Pugwash Group to present different views on major questions of rearmament and disarmament. Three of the principal speakers at the open meeting were Field Marshall Lord Carver, Lord Zuckerman and Lord Noel Baker. Some 250 people filled the hall. Joseph Rotblat, William Gutteridge and their British colleagues carried out with customary efficiency the host functions of preparation and organization of the meetings.

8th Workshop on Chemical Warfare, Geneva, Switzerland, 2 to 4 April 1981

This was the eighth workshop in our efforts to achieve a treaty in the chemical field analogous to the one for biological weapons in 1972. Again we concentrated on the principal obstacle to such a treaty, that is the verification of compliance with the provisions of a treaty. We examined in particular the complex problems of verification of stockpile destruction and non-production. These will be further discussed at the ninth workshop in early 1982.

Amongst the twenty-seven technical experts who attended were two participants from the People's Republic of China, the first scientists from that country to attend our meetings since 1960. Their interest in our more technical meetings is evident, and we hope that this presages their return to active participation in our other meetings.

37th Pugwash Symposium: "Confidence-Building Measures", Hamburg, FRG, 9 to 11 April 1981

Many new faces were present amongst the 27 participants at this symposium expertly organized by Count von Baudissin and his colleagues. Military, economic and scientific measures and psychological components involved in enhancing mutual trust and confidence were explored. Some of the measures discussed were notification of military manoeuvres and the presence of observers, increased economic interdependence through large-scale undertakings, such as the pipeline for gas from Eastern USSR to Western Europe, collaboration in research in high energy physics and in health, and freedom of movement for reciprocal visits of scientists and scholars. A monograph is in preparation for the excellent working papers.

38th Pugwash Symposium: "The Future of Pugwash", Rehovot, Israel, 26 to 30 May 1981

Thirty participants, many of them veteran Pugwashites, attended this symposium to which I shall refer later. Our deliberations were greatly helped by the excellent organizational arrangements provided by Shalheveth Freier and his colleagues.

Executive Committee and Council

The Executive Committee met three times during the year, in December 1980, in May 1981 and a few days ago here in Banff. The Committee dealt with preparations for future meetings, our publications and finances, and many other house-keeping details that required attention.

The Council met immediately after the Breukelen Conference and during the past few days to deal with major policy matters and future meetings.

Here I should like to acknowledge the continuing support and contributions of our President Dorothy Hodgkin, and the members of the Executive Committee and Council under the expert guidance of their respective Chairmen, Bernard Feld and Maciej Nalecz. It speaks much for Pugwash that the great personal sacrifice of time and energy this involves is given so unreservedly.

National Pugwash Groups

In some, but by no means all, instances there has been a heartening response by secretaries of national groups to requests of the Executive Committee for action, transmitted through the Director-General. These requests include nominations for Pugwash meetings, the recruitment of young scientists, an increase in contacts with both the scientific community and government decision-makers concerning the results of Pugwash meetings, and the payment of assessments.

We come now to a need which must be filled if Pugwash is to survive as an effective organization. This need is the raising of sufficient funds on a sustained basis. Our major problems are the adequate organization of meetings, and their attendance by key people. Both the national groups and the central office must obtain more money for these purposes. The central office is dependent on national groups to mobilize the additional funds. One successful device has been the organization of Friends of Pugwash on a national basis to support our efforts. I would like to cite in particular Bill Swartz's activities in the USA, and Michael Wyler's efforts in Switzerland. We are greatly indebted to both of them. One conscientious and devoted individual in each country to coordinate such efforts can produce striking results.

Recruits for Pugwash - Young and Old

You will be informed at this Conference about the second International Student Pugwash Conference held at Yale University in June, the first having been held at the University of California in San Diego in 1979. Jeff Leifer and Greg Gross sparked these Conferences. Their efforts to seed university campuses with the Pugwash spirit and concerns deserve the greatest support we can give. A national student Pugwash Conference organized here in Canada by Fraser Homer-Dixon was held in Ottawa, also in June of this year.

Our immediate need in this connection is to enlist as participants in our meetings young scientists already highly respected in the scientific community. This would do much to initiate and consolidate action amongst their contemporaries. Success in this will depend on your help to identify and enrol such young scientists.

At the same time, however, we must involve again in our movement, as we did in earlier years, eminent scientists throughout the world whose voices will be listened

to by governments and the public, as well as by the scientific community. More than ever in these times we need their active and continuing participation in our work. You will note an encouraging trend in this direction by referring to the lists of participants in our meetings during the past year.

Questions for Warsaw

We have a year to prepare for this important landmark in our history. It is not too early for us to begin the process of reflection and discussion which will determine our profile and map our activities for the next five years. I should like now to touch upon some of the questions we as individuals and as national groups must address for decision next August. We made a good start at our symposium in Israel in May on the Future of Pugwash, but let me itemize what I believe to be the major problems of organization and policy which require resolution by our collective wisdom. Many of these problems are not new and have been grappled with continually by our Executive Committee and Council, but they require a fresh examination by all Pugwashites.

1. Pugwash has been accused of being elitist because of its private meetings, restricted participation, and attempts to influence international affairs from the inside rather than through public pressure. Often we have fallen between two stools in trying to satisfy the need for privacy and our responsibility to inform the public to the widest extent possible. Should Pugwash become a more public organization, and if so, to what extent?

2. Should Pugwash continue to be involved in social and economic problems of less developed countries?

3. Given our limited resources, which particular subjects for workshops and seminars should Pugwash focus upon?

4. As I have mentioned previously, it is essential that new blood and especially young scientists of high calibre be recruited for more active participation in our work. How can this best be done?

5. The functioning of Pugwash could be vastly improved, both at national and international levels. Our very limited funds is an often crippling constraint. How can this defect be remedied, keeping in mind the need to retain our full independence of action?

The July issue of the Newsletter contains a report and the texts of working papers of the symposium in Israel which deal with most of the above problems. Some of the views are widely divergent, but they will have to be reconciled in a way that will maximize whatever impact we may have - and this should be neither exaggerated nor underestimated. I should like to cite here a cogent observation made by Francesco Calogero in his contribution to the symposium in Israel (Newsletter, July 1981, p.21). Calogero notes the deterioration in the world situation, and in particular the overall crisis in the arms control approach and in detente. He asks whether this should be interpreted as proof of the failure of Pugwash's effectiveness, and whether this means that we must drastically change our ways. He answers that such a conclusion would not be justified because we cannot presume to have such a determining influence on world events. But, he goes on to say, however frustrated each of us may be by current developments, we should nevertheless realize that the little influence any of us can hope to have on world affairs is multiplied manyfold by operating through Pugwash.

Near Horizons

We are now about to begin our working sessions at this Conference which has been so excellently arranged by the Canadian Pugwash Group led by William Epstein, and so generously supported by the Canadian authorities.

The theme of our present Conference is "The Search for Peace in a World in Crisis". One wonders how critical a crisis would have to be before an escalation of local to regional to global conflict took place. We cannot estimate this with accuracy but there is little doubt that the great powers are on an extremely dangerous course which can be altered only by a dramatic stop and reversal of the arms race and international tensions.

We are witnessing the tragic spectacle of political leaders and their advisers - backed by a largely uncritical press - who admit that after some three decades of arms control efforts we are less secure than ever. The same people then go on to assert that peace can be secured only through an increase in weaponry to meet the presumed threat of domination by the opponent, thus providing a recipe for disaster.

Nations appear to be in thrall to a perverted logic which declares that nuclear weapons should never be used, while at the same time calling for more of them to achieve an undefinable parity, as if the overkill already at hand were not enough.

And this grotesque justification for the waste of our resources is made in the face of starvation and misery in the developing countries, not to mention the cultural and economic deterioration occurring in the industrialized societies.

Lately, we have been treated to a well-publicized resurrection of the neutron bomb, with its supposed virtues extolled by one side and its 'inhumane' properties condemned by its opponents. This battlefield toy of the generals has been known for many years. It is one of the products of the fertile brains of some of our scientific colleagues who are devoted to the achievement of peace through new weapons - a pattern lucidly described by Herbert York in his noteworthy book "Race to Oblivion" published some ten years ago.

The neutron bomb is by no means a monopoly of one power, and if not already present it will probably appear in the arsenals of all the nuclear powers, even if only for prestige purposes or as bargaining chips. We shall then have achieved the usual result of less security for all. We should not be diverted by the public clamour surrounding this particular weapon. To keep it in proper perspective, it should be considered as occupying a place alongside other so-called tactical and 'modernized' theatre nuclear force (TNF) weapons such as the Pershings IIs, cruise missiles and SS-20s, all of which provide a grave risk of actual use in the first stages of battlefield combat. It cannot be repeated too often that any breach in the barrier separating the use of conventional from nuclear weapons is particularly dangerous, since it would open the way for a likely escalation of the conflict to a general nuclear exchange.

Pugwash should recommend the cessation of production and deployment of all TNF weapons, and not merely of the neutron bomb. Our unswerving aim should be to outlaw the use of all nuclear weapons, and not just one or the other because it happens to be an emotionally charged one which temporarily attracts the public's attention.

What else can and should Pugwash do? Let us examine some possibilities.

1. There is no lack of recognition of the increasingly dangerous trend in world affairs by many prominent individuals, including scientists of East and West, North and South who are raising their voices, often at great personal cost, against the position of their governments. Perhaps one of the most encouraging developments during the past year has been the rise in public opposition to the assurances of leading politicians that success lies in their self-serving prescriptions for peace and social prosperity. The public is beginning to recognize all the evidence to the contrary, and their activities could well turn the tide towards sanity. I cite for examples the action of members of the medical profession in the new organization International Physicians for the Prevention of Nuclear War, and the actions of the European Nuclear Disarmament and World Disarmament Campaigns which deal even-handedly with the East and West. We should encourage such efforts.

2. Pugwash has committed itself during the next year to collaborate with UNESCO in preparing a publication and meeting on the role of scientists in the arms race and disarmament in preparation for the second United Nations Special Session on Disarmament (UNSSOD) scheduled for the early summer of 1982. The general principles adopted by UNSSOD I in 1978, thanks in good part to the untiring efforts of Garcia Robles, can scarcely be improved upon; but as with the UN Charter, these principles are being given little more than lip service. Nevertheless, we must not cease our efforts to achieve concrete results with the UNSSOD approach.

3. Rough calculations have been made by the United Nations and some national organizations on the consequences of nuclear war at different levels of geographical involvement and intensity. What is needed is a careful collaborative study of this question by an international group of scientists whose authority and objectivity cannot be questioned by the public. Pugwash could help inaugurate such a study.

4. Realistically speaking, we are apparently imprisoned by the concept of deterrence for the foreseeable future because of the deep and pervasive distrust between opposing sides. If we have to live with the deterrence principle, Pugwash could well attempt to encourage an analysis of the level and types of arms which would constitute minimal assured deterrence, i.e., MAD, without the over-kill of destructive capabilities now threatening civilization. Many of us are convinced that at least a 90-95% reduction of nuclear arms can be made at a stroke by both sides, without compromising either side's perception of their own security as dependent upon an invulnerable deterrent capability. A serious study of this problem sponsored by Pugwash could have a great impact. In the meantime we should press for a universal "no first use" agreement for nuclear weapons. As Bernard Feld has noted, flimsy as such a shield may be, it has served extremely well in the case of the Geneva Protocol of 1925 which was addressed to the problem of chemical and biological weapons.

5. The deterrence concept itself needs profound re-examination. We had an exploratory Pugwash meeting in Kyoto on this subject some years ago, but the press of other activities and other factors did not permit us to pursue the matter.

6. We have also to consider what Pugwash can do with respect to the Third World. Matters directly connected with military activity and conflict resolution would appear to be the most appropriate areas of attention for Pugwash. Our 1983 Conference will be held in Sri Lanka which will help to focus our attention on the severe problems of the Third World.

Given our financial and organizational constraints how should we select for action amongst the above - and many other - choices? I submit that the main criterion should be the uniqueness of any contribution that Pugwash could make towards averting nuclear war - unique in the sense that it could not be carried out as effectively by any of the numerous groups concerned with peace and related problems. Thus it would not be a question of choice of disarmament as opposed to socio-economic development, depletion of natural resources, environmental degradation or other important questions. Rather, it would be the selection of activities that would exploit to the greatest extent the special attributes of Pugwash which are derived from the mutual respect and trust of scientific colleagues built over many years. A principal one is the maintenance of channels of communication between expert and influential voices of opposing sides for the prevention and resolution of tensions and conflicts, particularly in times of deterioration in international relations.

Coda

We are facing a world of disorder with immense difficulties and opposition to overcome. As Churchill pointed out in another context, however, without victory there is no survival. We must therefore renew our individual commitment of time, thought and action on behalf of Pugwash to change the cacophony into a beginning of world harmony. We may not have a Beethoven amongst us, but however small the contribution that each of us can make towards influencing events, it is compounded by our acting together. Let us therefore take heart and redouble our efforts towards peace through that singular and - yes - indispensable organization called Pugwash.

M.M. Kaplan

CONCLUDING REMARKS OF PROFESSOR DORTHY HODGKIN
AT THE 31ST PUGWASH CONFERENCE, BANFF, CANADA

In Banff we are very far from the world's troubles, from places where there is war and hunger and acute poverty. Among these marvellous mountains and supported by the grain and oil of Alberta, the generosity of Canada and Canadian Pugwash, we might easily forget their existence. But none of us will forget Olof Palme telling of the news on the day he spoke of the assassination of the President and Prime Minister of Iran with whom very shortly before he had been seeking to negotiate a peace between Iran and Iraq. The war between Iraq and Iran is of a kind that seems as old as civilization, ruining both combatants, leading to great misery, fought over a little piece of land (I should quote Shakespeare!) and now continuing day after day with modern armaments supplied by far too many of the United Nations that have pledged themselves to live at peace.

Yesterday, while looking at the eternal snows, we read news that the United States had vetoed the proposal in the Security Council to condemn South Africa for invading Angola. Many may have seen on television pictures of an earlier incursion: stricken Angolan families in makeshift shelters in the forest, their houses destroyed by bombardment it would seem impossible for any humane person not to condemn. There are other examples - these belong to the last two days - and over us all still hangs the threat of ultimate destruction in still more horrible ways by nuclear war.

In our secluded mountains we have been working all this week on our usual programme to stop the drift we see in the policies of the great nations towards ultimate disaster. So Working Groups I and II have met again to consider ways of avoiding nuclear war and avoiding conventional war. A freeze of nuclear armaments followed by their gradual reduction - and reduction perhaps of small battlefield arms first, seems the most hopeful course. Control of the arms trade and particularly an embargo on arms to nations at war seems most essential to avoid or - if avoidance fails - to stop conventional wars. Group III has been concerned with the course of the necessary negotiations to produce a comprehensive programme of disarmament supported by associated measures designed to lead us to the new international economic order. Energy and security, especially in relation to developing countries, are the subjects for Groups IV, V and VI, and these groups stress the need for better international control of the nuclear fuel cycle and the spread of nuclear free zones. The reports are filled with ideas worth developing - the discussions which gave rise to them were serious and often illuminating as you might expect from the galaxy of experienced talent that has been gathered here from East and West - experienced both in the Pugwash Movement and in the course of actual arms limitation negotiations, for the SALT treaties and for the United Nations.

Through many of the reports has run a thread of acute concern - that somehow governments be induced to see that disarmament is essential; and again and again we return to the necessity to impress upon them that this is the will of the people. There have, in fact, been many remarkable developments in this direction. I will give some examples. We talk in Pugwash of nuclear free zones. In the spring a wave spread over the City Councils of Great Britain. Following the lead of Manchester, over 80 Councils declared their territory to be nuclear free zones - no nuclear weapons were to be stationed within their

boundaries. A number of cities in Italy have taken similar action. In the United States, referenda in a variety of cities have shown large majorities for nuclear disarmament. I have in my hands (sent to me through a group of American women) the proclamation of the City of Birmingham, Alabama, which concludes:

"Now, therefore, I, Richard Arrington, Jr., Mayor of the City of Birmingham, Alabama, call on the President and Congress of the United States to act immediately to reduce tension between the United States and the Soviet Union; and to ask the Soviet Union to join in a temporary suspension of nuclear weapons production while seeking a permanent, international nuclear weapons ban. I make these pleas from a sense of crisis, and call upon our President and Congress to act with an equal sense of urgency.

In witness whereof, I have hereunto set my hand and caused the Seal of the City of Birmingham, Alabama to be affixed this the 6th day of June, 1981".

All over Europe there have been many demonstrations - Olof Palme told us how he had met in Paris the women of Scandinavia who had walked from Scandinavia to Paris to ask for action against the nuclear threat. There have been very large demonstrations in Germany - 100,000 people in Hamburg; in Japan the numbers were nearly a million. In Eastern Europe, and particularly in the Soviet Union, there has for long been a very strong peace movement - with branches in all 15 Republics of the USSR. Large sums of money have been given to support meetings, lectures, demonstrations and good causes such as that of refugee children. The number of signatories to the peace petition presented to the United Nations Special Session ran into millions. Through the World Disarmament Campaign, started by Lord (Philip) Noel-Baker and Lord (Fenner) Brockway, all these forces should be combined for maximum effect. Perhaps we should plan to sign reciprocal appeals to the United Nations for the next disarmament meeting.

But there is another side. In a recent Gallup Poll in the United States it was found that 80 per cent of those questioned favoured a meeting this year between the United States and the Soviet Union, to try to reach an agreement on nuclear disarmament; 72 per cent favoured a moratorium on the further building of nuclear weapons; 47 per cent, as against 43 per cent, believed in destroying all nuclear weapons. But 60 per cent in one vote - and 73 per cent in another - believed that the Soviet Union would not keep agreements. Terrible suspicion and distrust in the minds of the people still bogs down the disarmament process.

Here is another point at which we must come in, through education in all ways, to bring together the people of the Soviet Union and the United States of America. Many more of the them need to meet and know one another as we do in the Pugwash Movement. They need to live and work together, if they are to understand and trust one another. And scientists need to demonstrate in greater detail, not only the horrors of nuclear war but also the essential community of mankind.

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REPORT OF WORKING GROUP 1

AVOIDING NUCLEAR WAR

The Group expresses deep concern with the new intensification of the arms race in general and the nuclear armaments race in particular in the period since the last Pugwash Conference in Breukelen. At the same time SALT II is not in force, the whole SALT process is interrupted, and the nuclear disarmament negotiations are stopped completely or are in an impasse. An ominous spread of various concepts making nuclear war thinkable is coupled with suggestions to rescind agreements of the 'sixties and 'seventies limiting the arms race, including SALT I and NPT.

1. Nuclear Weapons Doctrine

The Group had a thorough discussion of the concept of deterrence and its relation to defence, especially in the European context. It was generally recognized that a situation of mutual deterrence based on the capability to inflict unacceptable retaliation was, as regards the central strategic systems of the superpowers, a fact of present life. The tendency to extend nuclear deterrence beyond that role was strongly criticized. The situation in Europe was referred to as a clear example of the grave danger of such an extended deterrence and of the arms race, which is bound to arise when nuclear weapons are deployed both for military use on the battlefield and for deterrence.

Nuclear weapons have no value for war fighting. Furthermore, the more people plan for the use of nuclear weapons, the more they come to believe that a nuclear war is survivable and winnable. The Group reaffirms that it is a fallacy to believe that nuclear war can be won. The Group rejects doctrines legitimizing limited nuclear warfare and aimed at providing the possibility of a winnable nuclear war. It was widely felt that the US, Soviet and European leaders should make an explicit statement that such doctrines are unacceptable, and that they should seek to maintain equal security at more stable and lower force levels. No-one can be confident that any nuclear conflict can be kept limited, and a doctrine for fighting nuclear war can only risk total disaster.

The Group felt that thorough consideration of the problems and implications of nuclear doctrines, including the concept of deterrence, which was discussed in detail at the Kyoto Symposium in 1975, is an important task for Pugwash and that efforts in this direction should be continued.

2. Nuclear Arms Control Treaties and Agreements

To reverse the current trend it is essential that the SALT process be continued and revitalized. The ABM Treaty must be retained above all for its value in maintaining stable mutual deterrence. The Group deplores the fact that SALT II is not yet ratified, but urges that both the US and the USSR continue to refrain from actions which could further jeopardize important provisions of the SALT I and II Agreements. US-USSR negotiations should be re-opened as soon as possible, retaining those positive elements already agreed and attempting to limit more strictly, and to reduce, nuclear arms. That would allow continued negotiations involving substantial reductions in nuclear arsenals and, as an even higher priority, qualitative limitations. The Group emphasizes the particular need to resume and complete at an early date talks on CTB. Other important negotiations, which have been deadlocked,

should also be resumed.

3. Freezing the Nuclear Arms Race

The Group considered proposals for a freeze on all US and Soviet nuclear forces at current numbers and characteristics as a first step towards nuclear disarmament. This suggestion may open the way out of the present impasse in the nuclear arms area. Freezing such arms would be the most useful step that can be taken now to reduce the likelihood of nuclear war and prevent the spread of nuclear weapons to more countries.

It was suggested that such a freeze does not require an exact equality in every category of weapons, since neither nation can attack with impunity or even credibly threaten an attack with the nuclear weapons available today. Hence a freeze could be taken by the American and Soviet governments by mutual independent actions, preceding the negotiations of formal treaty limits. Verification of such a measure would present some problems, but most thought that it could be adequately dealt with.

Many of the participants endorsed the 'strategy of suffocation of the nuclear arms race', the most important element of which is an early conclusion of a test ban treaty. Another would be a cut-off of the production of fissile material for weapons purposes.

4. Destabilizing Weapons Systems

Many consider that the foremost priority in the field of strategic nuclear weapons is to halt the current trend towards highly destabilizing systems which could be perceived as having a first strike capability. The acquisition by any nation of weapons systems which can significantly threaten important elements of the strategic deterrent of the other side only provides incentives for starting a nuclear war. Counterforce (countersilo) weapons are particularly dangerous since they create mutual fears of a first strike. When both sides have them, the situation is even worse than if one nation does. Not acquiring such systems is in the national interest of each party, even if done unilaterally. Matching such a capability is an invitation to greater instability and to disaster.

But it was also noted by the Group that the possibility of a disarming first-strike is excluded by the size and diversity of nuclear arsenals, including submarine-based missiles and bombers, so that any scenario contemplating a first-strike requires lunatic assumptions. Among the destabilizing systems presently being developed and deployed, the following were given particular emphasis as priority items for early control:

- a. ICBMs, with a countersilo capability, particularly those with terminal guidance.
- b. All types of cruise missiles.
- c. Strategic anti-submarine warfare (ASW). In this context it was proposed to stabilize the sea-based deterrent systems by the creation - unilaterally or by agreement - of sanctuaries free of ASW deployments for cruising submarines.
- d. Anti-satellite systems.
- e. Eurostrategic systems with a counterforce capability, including SS-20, Pershing II and Cruise Missiles.

5. Nuclear Weapons in Europe

The Group expressed particular concern about the dynamic worsening of the nuclear weapons situation in Europe. It is essential that serious negotiations begin soon before low limits on European weapons can no longer be achieved. The freeze mentioned in Section 3, might facilitate progress in this area.

It was pointed out by many that the deployment of medium and intermediate range nuclear missiles should be eliminated, preferably by mutual agreement but if not, unilaterally. Reference was made to the idea that the USSR dismantle its SS-20 missiles and that the USA does not deploy the Pershing II and cruise missiles envisaged in the 1979 NATO double decision. Some stressed that this was unbalanced and that non-deployment of US weapons should be coupled with certain reductions of the Soviet Union medium range weapons together with Forward Based Systems of the US and other elements of existing nuclear potential as well. The Group notes the ongoing Pugwash workshop on this subject and recommends its continuation.

The majority of the Group supports the proposal to eliminate by agreement or unilateral action all kinds of battlefield nuclear arms in Europe of range less than about 100 km. This would include the neutron weapons. Implementation of this proposal would raise the threshold of nuclear warfare. These weapons are the smallest and easiest to use, are often stored close to the battle line, and conventional substitutes do exist. Verification of significant violations would be possible. Therefore their withdrawal from Europe, together with a prohibition on their first use, would both increase stability and not essentially upset the present military balance. Such a measure of withdrawal should be accompanied by undertakings to prohibit training in their use.

6. Seeking Public Support for Nuclear Arms Control and Disarmament

Various suggestions were considered concerning ways and means of getting strong public support for nuclear arms control and disarmament measures. Some recommended that the Pugwash Council consider a workshop on effective methods for mobilizing public support. Many supported a proposal to form an international body of scientists of high prestige to investigate the dangers of nuclear warfare and inform the widest possible circles of the results of this investigation. Ways must be found to make the grave dangers and horrible effects understandable and meaningful to individuals in and outside of governments. It was also proposed that discussions of the nuclear arms race should be conducted more widely at scientific and other professional conferences. A large number of groups are organizing to build an international constituency for real nuclear arms control and disarmament. The Group recommends that Pugwash seek ways to make available the expertise of its members to these groups.

REPORT OF WORKING GROUP 2

AVOIDING CONVENTIONAL WAR

The Group decided not to repeat the discussions carried out on this subject in previous Pugwash Conferences, although many of the results then obtained are still relevant and should be taken into account. It was rather decided to use the limited

time for a review of a few subjects of particular importance.

Some Categories of Conventional War

1. There is a linkage between the problems of avoiding conventional war and of avoiding nuclear war because of: (1) the danger of escalation; (2) the nuclear powers are often directly or indirectly involved in conventional war; and (3) the prospects for denuclearization of a zone are affected, according to some views, by the concerns of major powers regarding a confrontation of conventional armaments. Several different types of conventional war, including civil wars and wars of national liberation, can be distinguished in principle, depending on the degree of this involvement:

- a. Conventional wars at the European border between the two blocs. Here the danger of escalation into a nuclear war is certainly greatest.
- b. Conventional wars in which one or both of the two major powers are directly involved with their own troops. Vietnam and Afghanistan were mentioned as examples by some participants. Others stressed the essential difference between the current situation in Afghanistan and the past war in Vietnam.
- c. Wars by proxy in which the major powers are only indirectly involved. As examples the conflicts involving Ethiopia and Somalia, the states in the Middle East, South Africa and Angola, and in Kampuchea involving Vietnam, were given by different participants.
- d. Wars deriving from inherent political, social, ideological or economic instabilities in a region without intervention from the major powers. The wars between Iran and Iraq, and Peru and Ecuador were agreed upon as examples. The conflicts in Uganda involving Tanzania and in Chad involving Libya were also mentioned here by some participants.

Obviously, borders between these categories are sometimes blurred. In particular, a conflict can develop from one type into another. The Middle East conflict, e.g., was of the above type 'd' in the beginning and is now type 'c'.

In surveying wars and areas of tension within these categories, the Group was concerned by the frequency of cases 'b' and 'c'. Realizing the seriousness of the involvement of the major powers even in a local crisis or war, the Group also noted the tendency for the zone of confrontation and military proximity between the major powers to be increasingly extended into the Third World. In the interest of the developing countries and world peace, this trend of direct, indirect or potential involvement of the major powers must be contained. The competitive energies between the two major powers should find other outlets than wars and wars by proxy, and should rather concentrate on the social, cultural and economic fields.

Regional Aspects

2. It was proposed that special agreements be concluded to establish areas of non-interference in crisis regions in which major powers have special interests. Agreement among member states of the region as well as of the major powers would be required. Guarantees by all concerned should be given for denuclearization, arms sale control, peaceful settlement of disputes, and regional cooperation including multi-lateral aid. Perhaps such a non-interference zone would act as a nucleus for further disengagement and stability in the periphery.

As an example for a possible non-interference zone, the Indian Ocean and some of the surrounding sub-regions were mentioned. The discussion showed, however, that there are different interpretations for the term 'non-interference'. Some

participants indicated that non-interference in the usual sense of the word is only possible in regions in which conflicts involving the interests of the big powers cannot arise. Some other members expressed the view that the provisions of the UN Charter about non-interference should be universally adhered to.

Stability by Defence

3. Our final goal is disarmament. Before this can be reached, as a means to stabilize peace and to discourage aggression defensive arms should in principle always be stronger in each country than offensive forces. From a purely technical point of view it may often be difficult to distinguish between offensive and defensive weapon systems. The distinction becomes easier, however, when the total geographical and political situation is studied on a case by case basis. The majority of the Group suggested that Pugwash should consider the possibility of convening a Workshop to assess the feasibility of purely defensive arms.

The principle of superiority of defensive forces should also be taken into consideration of the MBFR talks in Vienna. The reduction of forces should maintain the security of all countries at the lowest possible level of troops and armaments. In assessing this level the force structures and the total military potential of each side should be considered rather than comparing individual elements.

Confidence Building Measures

4. Leaders of the major powers in their meetings, in addition to discussing urgent short-range problems, also should develop some common visions of the requirements of the foreseeable future.

5. Unilateral steps in arms reduction and in withdrawal of forces, taking into account the requirements of mutual stability and security, should be taken. As examples the withdrawal of 1,000 tanks from Central Europe by the Soviet Union in 1979/80, and the decision of the US to withdraw 1,000 nuclear weapons from Europe were mentioned.

6. It was felt that, as an overall objective, a broader exchange of information on military activities and on doctrines and matters related to mutual security and to intentions for the use of existing and planned armaments would avoid worst-case scenarios and an unnecessary arms race, and would decrease mistrust among states and their peoples. In this context, it was emphasized that there is an urgent need for the current confidence-building measures to be enhanced and broadened to include a wider range of military activities. Fear is aggravated by ignorance.

7. In all measures relating to armaments, deployment of forces and arms control the perceptions and fears of the other side should be taken into account.

8. In order to improve mutual understanding and confidence for the purpose of avoiding wars, fields of common interest should be maintained, expanded and developed. In particular, it was suggested that:

- the universality of science should be respected and any restriction in international scientific cooperation should be avoided;

- the experience of scientific unions in international cooperation should be used and extended for this purpose;

- international scientific and technological projects from which all sides would benefit should be taken up in increased numbers and of wider scope; and

- the authorities responsible for education in individual countries should introduce into the curricula more detailed and objective information about the history and achievements of other countries to promote better understanding.

Arms Trade

9. Most countries, and particularly those in the Third World, spend a disproportionately large part of their national resources on armaments. This not only impedes their development but enhances the dangers of conventional war. All governments are urged to curb the activities of the arms trade originating in all parts of the world. The international arms market should be brought under control by all available means.

Concluding Remarks

10. In dealing with the problem of how to avoid conventional war the Group was aware of the fact that this problem is inextricably intertwined with the problem of avoiding nuclear war, particularly in those regions where nuclear weapons are stock-piled on both sides. The question was discussed how these regions could be denuclearized without endangering stability and security. It was recognized that the requirement of stability after denuclearization will require a reassessment of the conventional armaments and forces in those regions.

On the other hand, it was also discussed to what extent a considerable reduction in conventional arms and forces could make it possible for NATO to renounce its doctrine of keeping open the option of first-use of nuclear weapons. Pugwash should continue to obtain deeper insight into the related problems by Workshops with experts from all sides.

REPORT OF WORKING GROUP 3

NEGOTIATIONS ON ARMS LIMITATION AND DISARMAMENT

1. Negotiation of arms control and disarmament agreements is an essential alternative to the illusory hypothesis that international security can be gained by an unrestrained arms race, allegedly aimed at achieving a military balance. In spite of some limited successes - (the Biological Weapons Convention, the Partial Test Ban, the Non-Proliferation Treaty and the beginning of SALT) - the net results of negotiations to date have been less than modest, as the current acceleration of the arms race, especially since 1978, forcibly reminds us. The usefulness and value of such negotiations depend strongly on the degree to which they address the reduction of weapons and lead towards the eventual elimination of all mass destruction weapons, rather than attempting a transitory balance of power on a global or regional basis, or in terms of particular weapons systems. The continuing increase in arsenals, particularly weapons of mass destruction, only weakens international security. The proposed deployment of Pershing and Cruise Missiles in Europe to counter the Soviet SS-20 and similar nuclear missiles is a case in point. One has to ask whether such weapons of mass destruction have the military value ascribed to them by military and armament experts, or whether they represent some political or symbolic significance in terms of relative power balance.

2. A rough parity in military capability exists between the superpowers. Each could inflict unacceptable damage on the other, many times over. An immediate freeze of the respective nuclear arsenals of the USA and the USSR should constitute a first step towards a comprehensive disarmament programme. Such a freeze needs to be rapidly reinforced by substantial reductions and significant qualitative limitations on

nuclear arsenals, as contemplated in declarations of the governments concerned, as well as by other measures such as: the conclusion of a multilateral Comprehensive Test Ban Treaty; the cessation of testing new delivery systems; the cessation of the production of all types of nuclear weapons; and the cut-off of the use of fissionable material for military purposes. SALT talks should be resumed, and negotiations on all nuclear weapons in Europe should begin. Proposals along the foregoing lines have been made by several governments and individuals. In this connection, the Group strongly supports the foregoing proposals, including the suggestion recently made by George Kennan for an overall cut of 50% of the nuclear arsenals of the USA and USSR, a proposal which several members of the Group favoured extending to all nuclear weapon states.

3. Negotiations, to be realistic, must address the basic problems of threats to peace as well as that of stopping the momentum of an accelerating arms race fuelled by technological innovation. No plan for general and complete disarmament can be realistic, or lasting, unless governments return to the observance of their obligations under the Charter of the United Nations and forego the use, or the threat of the use, of force in the pursuit of their national interests. A return to a law-abiding system is a necessary corollary to an effective system of arms limitation and disarmament. This, however, does not mean that arms limitation and disarmament should be linked with conditions relating to specific threats to world peace. But the present practice of making arms transfers to areas of military confrontation such as the Middle East, Africa, Latin America or Asia, needs to be restrained if conditions favourable to disarmament are to be created.

4. Decisions taken independently by governments to reduce their armed forces and weapons, or to reject foreign troops and weapons on their soil may be at least as important as arms control and disarmament negotiations in dictating the possibilities of disarmament. Independent decisions to reduce arms can in themselves contribute to disarmament and may foster negotiations. Examples include the withdrawal by the Soviet Union of 1000 tanks and 20,000 soldiers from Central Europe in 1979, and the USA decision to withdraw 1,000 nuclear weapons from Europe, as well as the decision taken in 1969 by the United States to stop the development, production and stockpiling of biological weapons and to destroy existing stocks. It was suggested that the two superpowers and other nuclear weapon states might separately offer programmes to the United Nations, setting out the reduction of nuclear weapons and other weapons of mass destruction they are prepared to undertake in the interests of world peace.

5. The Group is concerned about the dangers of chemical weapons. It recognized the importance of the work being done by the Committee on Disarmament on a convention to eliminate chemical weapons. Some suggestions concerning verification of such a convention were put to the Group. The work of the Pugwash Study Group on Chemical Weapons was noted and it was acknowledged that this group should continue its work, paying special attention to the question of verification.

6. Civilians would be the main victims of war with modern weapons, and nuclear war threatens the very survival of us all. Therefore, there should be greater openness by governments about the consequences of nuclear war, as well as about their defence and disarmament programmes. Governments should refrain from exaggerating the military strength and hostility of potential rivals, including misleading information about civil defence for instance, that could give a false impression of hostile intents or preparations. Non-governmental organizations, by conducting programmes of public education can greatly aid governments and the people to understand disarmament matters. They may also help to establish a consensus on policy issues. The United Nations is recognized to have a central role in this process.

7. The Group welcomes the work being carried out by the Committee on Disarmament for the elaboration of a Comprehensive Programme of Disarmament which would be self-contained and would fit the description made of it in the Final Document of the first Special Session of the UN General Assembly devoted to disarmament (UNSSOD I). Such a programme should ensure that the goal of general and complete disarmament under effective international control becomes a reality in a world in which international peace and security prevail, and in which the new international economic order is strengthened and consolidated.

8. The Group therefore recommends that the Programme encompass all measures thought to be advisable for its achievement. These could be divided into two broad categories. The first would cover what is normally called in the United Nations 'disarmament measures', embracing all types of measures dealing with disarmament, whether they be for the prevention, the limitation, the reduction or the elimination of armaments, or for the reduction of armed forces. The second category would comprise all other relevant measures - which could be listed under the general heading 'associated measures' - such as: those aimed at ensuring that disarmament makes an effective contribution to economic and social development and, in particular, to full realization of the new international economic order; those intended to contribute to the strengthening of international procedures and institutions for the peaceful settlement of disputes and for the maintenance of peace and security in accordance with the Charter of the United Nations; those whose main purpose would be to avoid dissemination of false and tendentious information concerning armaments and to mobilize world public opinion in favour of disarmament through a world disarmament campaign, coordinated by the UN Secretary-General; and those which are usually referred to as 'confidence-building measures'.

9. While the Comprehensive Programme would thus contain measures of an identical nature to those included in the Final Document, the two documents would however present some substantial differences, as the following: due to its comprehensiveness, the measures to be included in the Programme would be more numerous than those contained in the Final Document; the measures would be enunciated in a more concrete manner and described more specifically than they are in the Final Document, and they should be assembled, as integral parts of a disarmament process in the number of stages considered to be desirable in order to ensure that they are carried out in 'an equitable and balanced manner', and in such a way that the security of all states is guaranteed at progressively lower levels of armaments (both qualitative and quantitative); and that the Programme culminates in the conclusion of a Treaty on general and complete disarmament under effective international control, as contemplated in the Final Document.

10. It should be recalled in this respect that the Final Document of 1978, which in theory is an outstanding document, has in practice remained a dead letter. Bearing in mind this sad experience derived from UNSSOD I, the Group believes that one of the most important features for inclusion in the Programme would consist of a firm undertaking of all participant States to abide strictly by the provisions of the Programme, and their recognition of some kind of binding force to such provisions. No effort should be spared, both by the Committee on Disarmament and by the UNSSOD II to attain this goal. The moment has now come to prove with deeds that we take seriously what the United Nations rightly affirmed in 1978: 'Mankind is confronted with a choice: we must halt the arms race and proceed to disarmament or face annihilation'.

REPORT OF WORKING GROUP 4

ENHANCING INTERNATIONAL SECURITY

The threat to civilization resulting from the arms race and the proliferation of nuclear weapons is complemented by parallel dangers arising from the continually increasing level of military expenditure. The risk of global annihilation combined with the diversion of resources, material and human, constitutes an absurd situation. It is, however, tolerated by the nations of the world and they take no serious steps towards disarmament. Even the more promising arms control measures have been limited in effect. Nevertheless, the process of arms control must be continued and strengthened. The enhancement of mutual security is a necessary prerequisite since, as a practical matter, states are unlikely to disarm as long as they feel that their security is endangered.

In the different countries in the world the nature of the 'threat perception' which has been seen as justifying military expansion varies. Some threats are insubstantial or emotional, but there is generally a real conflict of interests relating to the survival of the different states, in military and economic terms. Since the oil crisis of 1973, the growing competition for energy, metallic, mineral and food resources has become for certain countries a critical factor and exacerbates military and political rivalry.

The world needs mechanisms and processes, comprehensive and regional, to enable the identification of mutual interests and of the areas in which, in changing circumstances, survival depends on cooperation. The growing complexity of international relations, the interaction of conflicts and disputes, the increased polarization and other factors, aggravated by the escalation of the arms race, create dangerous tensions.

The Role of the UN

A major purpose of the UN is to enhance international peace and security by providing an orderly institutional framework within which conflict situations may be resolved, or at least controlled, in a civilized and peaceful manner. One of its objectives is to induce parties to disputes to modify their conflicting goals and to replace their desire to win in any political conflict situation by a readiness to accept negotiation and compromise. It must be recognized, however, that absolute solutions of serious international disputes may be difficult or impossible to attain at a given historical moment. Moreover, governments continue to pursue policies to protect their national interests, both within the UN and outside the organization. It is important for the UN to encourage accommodation and initiatives which progressively change the terms of a political problem. In this respect, the activities and resolutions of the deliberative bodies (the Security Council and the General Assembly), which are necessarily political, play a crucial role. But it is necessary to preserve the UN's other role - as an impartial instrument at the disposal of the international community for purposes of conflict control (peace-keeping) and conflict resolution (peace-making). These functions are normally entrusted to the Secretary-General, who may be asked to establish peace-keeping operations or observer missions pursuant to resolutions of the Security Council, or to make available his good offices to deal with the underlying political problems. The impartiality of the Secretary-General in carrying out tasks of this kind needs to be carefully preserved.

Non-governmental organizations (NGOs), including Pugwash, have an important role to play in creating the necessary political climate. In the end, the resolution of a crisis will depend, as in Zimbabwe, on political will, but a more realistic

appreciation of the processes involved would certainly contribute. To this end the Group urges strong support for a special session of the UN on International Security, to parallel that on disarmament, and to consider all relevant aspects of this matter.

Crisis Management and an International Satellite Monitoring System

The usefulness of an international satellite monitoring system for the prevention and management of crises especially for the verification of future multilateral disarmament or arms control agreements, and for reassurance about the intentions of other parties, is endorsed by the Group. Some participants are of the opinion that in given circumstances the use of aircraft would suffice. Considerable advantages to the UN are seen in the management of such an information instrument by a consortium of countries, to a degree autonomous.

Human Rights, Humanitarian Law and International Security

Human rights and related issues were discussed in the context of international security. The importance of full implementation of the provisions of the UN Covenants on Human Rights and of the relevant clauses in the Helsinki Final Act is undeniable. In the spirit of Pugwash and in the determination to avoid war, the essential internationally accepted principles of human rights must be entirely respected even if on some occasions problems in this respect arise in international negotiations. Throughout its discussions the Group searched for realistic and constructive ways of improving the international climate.

People need not only to think but to feel in a different way, and social circumstances may now favour the reduction of historical enmities. Human rights require continuous attention. The right to survive, in the face of nuclear war, is the overriding priority today.

It is almost certain that a general endorsement and ratification of the recently signed Geneva protocols on humanitarian laws, and the implementation of the agreed rules relating to common humanitarian standards in local wars, would assist the improvement of the international climate.

Regional Arms Control Measures

The identification of mutual interest is likely to be more easily achieved regionally. The possibility of implementing proposals for a Nordic nuclear free zone should be further investigated along with a similar suggestion for the Arctic. The response by President Brezhnev suggesting the inclusion of certain parts of Soviet territory in an arrangement of this type is particularly encouraging.

In addition, the possibility of designating submarine sanctuaries in the Arctic Ocean may have merit as part of the strategic arms limitation process.

Proposals relating to other areas, be it the Balkans and the Mediterranean, the Middle East, the Indian Ocean or Central Europe, deserve urgent consideration, and full weight should be given to the independent views of the countries of the particular regions.

Confidence Building Measures

The observation of the letter and spirit of the ABM Treaty is currently a very important question and should be pressed.

The success of the Standing Consultative Commission in monitoring SALT

agreements and in facilitating the exchange of information in a relatively private way was stressed. The view is taken that such a formal arrangement, with a predetermined composition and schedule, is probably essential to the effective functioning of international arms control agreements of this kind to ensure technical implementation, and to remove ambiguities, and thereby generate mutual confidence.

Expanding the scope of the confidence building measures initiated in the Helsinki Final Act is an urgent necessity.

Economic cooperation as reflecting the realities of interdependence and enhancing international confidence and goodwill is highly desirable. It should, however, be realized that in some circumstances the resulting dependency and vulnerability may prompt the use of sanctions, which can prove ineffective and a further source of tension. To be fully effective, especially in the long term, economic cooperation has to be accompanied by adequate political understanding.

Conclusion

The recent decision about the neutron weapon, which in some senses is just another nuclear weapon, has, however, increased fears of war and intensified emotional reactions. This is an example of the need in decision-making to respond to the anxieties both of antagonists and allies. Pugwash should take the opportunity which this regrettable development provides and channel the justified popular reaction to the neutron bomb into opposition to all nuclear weapons.

Security is not a game in which one can win at the expense of another, but rather is strictly mutual. Differences not only in political systems and in the social psychology of peoples but even in terminology promote misunderstandings. An important role for Pugwash is to act as interpreter or intermediary by holding frank discussions on these sensitive issues. Symposia or workshops on the psychological aspects of international security would play a useful role in this regard.

The Group concluded that disarmament and security are inseparable and should be taken in tandem. For this reason, a positive attitude should be adopted in responding to unilateral initiatives by participants in the arms race, as in the case of the proposal to freeze the deployment of medium range nuclear weapons in Europe.

REPORT OF WORKING GROUP 5

ENERGY, RESOURCES AND INTERNATIONAL SECURITY

Introduction

As emphasized by previous Pugwash Working Groups treating energy and resources, the problems of supply and distribution of energy, water, food, fibre, metals and other resources are closely intertwined with each other and with the broader human predicament encompassing population, environment, development and security. (See especially the report of Working Group 6 at the 27th Pugwash Conference, Munich, "Energy, World Resources, and Population Trends", and the report of Working Group 5 at the 29th Pugwash Conference, Mexico City,

"Energy Strategies for Developing Countries"). The interactions between resources and international security, in particular, more often involve combinations of types of resources than they involve energy or food or water or metals alone.

Working Group 5 this year nevertheless has chosen to focus mainly on the links between international security and energy. We believe, however, that many of our observations have relevance to related and analogous problems with other resources.

The body of our report is organized into three subsections: first, the nature of the interactions between energy and international security; second, strategies that individual countries might pursue to reduce the potential for damage caused by these interactions; and, third, international strategies to reduce the potential for damage.

Interactions Between Energy and International Security

The links between energy and international security are two-sided. International tensions and conflicts can disrupt the production of energy-exporting nations or their willingness to supply energy to others, sever the transport links between producers and consumers, and damage the domestic energy facilities of combatant nations; and the energy demands of military activities divert energy from the direct support of human well-being.

On the other side, energy problems (and sometimes the steps taken to solve them) can influence the likelihood and severity of international conflicts. These connections include the contributions of energy problems to the root causes of conflict, the potential of energy problems to serve as the immediate stimulus or trigger for conflict, and the links between energy problems and policies and the means of conflict (that is, the size and character of military forces).

The contributions of energy problems to the root causes of international conflict include: (a) the uneven distribution of the richest energy resources and of access to the technology and capital to exploit energy resources, contributing to the demoralizing and instability-producing income gap between rich countries and poor ones; (b) large and unpredictable variations in the world market prices of internationally traded energy forms, most importantly oil, which variations threaten the viability of the economies of both rich countries and poor countries; (c) the national economic and social instability that may result from over-reliance of national economic development on the exploitation of a single energy resource; and (d) energy-related environmental problems - carbon-dioxide's influence on climate and effects of acid rain on fresh-water fisheries and forests being two notable examples - that can cross national boundaries to harm the innocent and to generate massive resentments.

The possibilities through which energy may serve as the approximate cause of conflict include: (a) military intervention to protect or deny access to another country's energy resources; (b) conflict over energy resources under disputed jurisdiction (e.g., sea-bed oil and gas); and (c) energy-related facilities with potential military applications becoming a military target.

The links between energy problems and policies and the means of conflict include: (a) the use of oil revenues to fund regional arms races among oil exporters and their neighbours; (b) balance-of-payment problems of industrialized oil importers adding to their incentives to export weapons; and (c) energy-technology developments facilitating development or deployment of

related weapons systems (e.g., fission, inertial-confinement fusion, solar power satellites).

The Working Group has chosen to focus its discussion of ameliorative strategies on a subset of three specific energy → conflict linkages of particular importance and timeliness: the rich-poor gap in energy, mirroring and helping maintain the overall gap in human well-being with its fallout of frustration, resentment, tension and instability; the overdependence of many nations on a few geographically concentrated supplies of oil, with attendant possibilities for conflict arising from attempts to protect or deny access to these resources; and the links between nuclear fission power technology and the potential for accelerated spread of nuclear weaponry to an ever larger number of nations. This order of listing implies no ranking by importance, and we have not attempted one. We believe that all three linkages are potentially catastrophic and deserve the most concerted attention of the technical and policy communities.

Strategies for Individual Countries

The global nature of the problems with which we are dealing calls for a global approach. Still, as long as humanity is organized in national states - and this is, indeed, at the root of many facets of these problems - policies must be approved and implemented by individual countries or, sometimes, by groups of countries.

Utilization of energy throughout the world is very uneven. To illustrate: reducing by twenty percent the commercial energy use of the rich one-quarter of the world's population would make available enough energy to double the commercial energy use of the rest - the three-fourths of the world's population who are poor.

Conflicts over access to energy resources by industrial countries conceivably can engender major wars. It is important to emphasize, however, the overwhelming nature of the everyday hardships and deprivations caused by energy shortages in developing countries. These may lead to internal chaos and consequent disruption of the world order. Unfortunately, the difficulties in overcoming energy problems in developing countries are often especially severe. These difficulties stem not only from the imperative need to ameliorate living conditions and improve education, and from high birth-rates, the lack of capital, the inadequate infrastructure, and the shortage of technological capabilities, but also from the fact that a vast diversity of social and cultural conditions and practices have to be taken into account.

Energy policy should be incorporated within comprehensive development plans, which take into account various needs and balance short-term, medium-term, and long-term goals. In considering the relative costs and benefits of various mixes of energy sources, moreover, countries must be cognizant that no energy source is free of costs and liabilities; that the costs may be environmental, social, and political as well as financial; and that rational trade-offs may call for paying higher financial costs in some instances in order to reduce sociopolitical and environmental costs.

Under a wide variety of circumstances, increased efficiency in the use of energy, especially that derived from oil, is the fastest and cheapest way to reduce vulnerability to energy shortages, and must be encouraged. This prescription applies most forcefully to industrial countries, where oil is lavishly consumed, but increased efficiency also can contribute greatly to the economy and security of many developing countries.

The magnitude of technically recoverable energy resources is greater than often envisaged. Even oil and gas are still available in many localities, albeit often in smaller deposits and at higher extraction costs than would have been considered attractive a decade ago. At today's world energy prices, the exploitation of relatively small but widely distributed deposits has become increasingly attractive, the more so because the small scale of the individual projects alleviates the problem of raising the capital and because the dispersed nature of the deposits reduces transport costs. The responsible development of such resources ought to be encouraged through incentives, legislation and other means, keeping in mind the limited lifetime over which any fossil resource can be exploited.

Significant progress recently has been made in the production of oil from heavy oils and tar sands, the world resources of which may exceed those of conventional oil. World resources of coal and oil shale are also very large, but, with respect to all the fossil fuels, the reservation must be expressed that world use might be constrained far below the resource limits by intolerable environmental damages of combustion - notably disruption of agriculture by carbon-dioxide-induced climate change, and damage to forests and fresh-water fisheries by acid rain.

On the other hand, a prudent degree of development of the technically available dispersed and unconventional fossil-fuel resources can decrease today's dependence on a few geographically concentrated deposits of oil and gas and thus contribute to reduced vulnerability to both energy shortages and fluctuations in price.

Due in part to its military applications, more government effort probably has been devoted in recent decades to the development of nuclear energy than to all other energy sources combined. Its potential and problems have been treated extensively in the reports of previous Pugwash working groups on energy (notably Aulanko, 1973; Baden, 1974; Munich, 1977; and Mexico City, 1979). Members of our working group expressed a range of opinions on the cost of and need for energy from nuclear fission. It seems, however, that fission power installations can be made reasonably safe, that the waste-disposal problem can eventually be technically solved (although public acceptance in some cases may be another matter), and that there are circumstances in which nuclear power provides the most economic source of electricity. There remains the special problem of the abuse of nuclear power through national or subnational diversion of nuclear materials for use or threat of use in nuclear weapons. Present safeguards are far from adequate, and no foolproof defences against misuse seem possible. At the same time, the technical potential of nuclear fission to contribute to meeting world energy needs is undeniable, and the technology in any case cannot realistically be banned. International measures to reduce its security risks are discussed below.

Irrespective of the future contribution of fission power, it is important for many reasons that its dominance of energy-research funding be ended. Among other non-fission options, renewable energy sources are particularly deserving of both increased research support and systematic attention to means of lowering institutional and social barriers to their use. Our enthusiasm for renewables is based in part on the large potential for biomass-energy production, hydropower, direct solar energy use, and possibly geothermal energy in many developing countries, and on the indisputable need to build the world's long-term energy future on sustainable sources. In the former connection, it is worth reiterating the Mexico City Working Group's concern that industrial nations take seriously

their responsibility, as sponsors of most of the world's energy research and development, to foster research relevant to developing countries energy needs as well as to their own. In this light, and to help ensure energy supplies for future generations, we urge the industrial nations to increase their funding for renewable-energy research.

Clearly, developing countries must in any case strive to put in place the scientific and technological infrastructure that will help them develop and deploy renewable and other energy sources suited to their needs, but the industrial nations must recognize their own interest in assisting this process in every way possible.

An increased degree of national self-sufficiency in energy supply, by whatever combination of means it is attained, clearly has a role to play in reducing some of the energy-related threats to international security. A few countries around the world already are completely self-sufficient in energy, and some others could become so with an all-out effort (although genuine self-sufficiency must take into account not only total energy supply but the proper mix of energy forms matched to end-use needs). Complete self-sufficiency is not worth pursuing without regard for its costs, however, and the environmental and sociopolitical costs must be considered along with the financial ones. That achieving autarky can require unjustifiable sacrifices is illustrated by the example of the fuelwood available in many developing countries: a large, albeit temporary, contribution to energy self-sufficiency might be made in these countries by cutting down forests much faster than reforestation and regrowth can replace them, but the resulting deforestation and erosion would make this policy a disaster.

Apart from the sometimes intolerable costs of complete self-sufficiency, moreover, a certain amount of interdependence often serves to improve relations and reduce tensions among countries. A combination of a prudently increased degree of self-sufficiency, coupled with diversification of sources of imports, seems the best policy for most countries.

International Strategies

Although most actions to deal with energy issues must necessarily be taken by and within countries, the global nature of the energy economy requires a high degree of international cooperation. Thus international measures are needed to support national strategies by facilitating access to capital, technology, and security of both supply and markets, as well as to provide for management of resources with an international character, including the "commons". Unfortunately, the fragmentation of responsibility and the imbalances in institutional and financial resources devoted to various energy sources, which constrain effective national energy strategies, are reflected and to some degree compounded at the international level.

Ultimately, a global "compact" of internationally agreed arrangements governing the development, supply, utilization and financing of energy would enable the world's energy needs to be met in ways most compatible with economic, social, environmental and security considerations. Because oil prices continue to be a large factor in planning and decisions in respect of alternative sources for importers, and in national economic planning for exporters, international agreements facilitating greater stability and predictability of oil prices would contribute to world economic stability and hence to security.

As a prime instrument for implementing such a compact after it has been

achieved, a World Energy Organization should be created as a specialized agency of the United Nations. But it is clear that global agreement on energy cannot be achieved in isolation from the other important issues which are now on the agenda for global negotiation, largely in relation to the drive for a "New International Economic Order". Under present political conditions it is, unfortunately, not likely that these negotiations will produce a major breakthrough in global cooperation in the near future.

Nevertheless, many measures can and urgently need to be taken which do not have to wait for agreement on a global compact, and indeed could do much to facilitate it.

Particularly urgent are needs to increase the funds and technical assistance available to developing countries through existing agencies, both multilateral and bilateral. Creation of an international consultative group would provide an immediate impetus for the mobilization and coordination of an increased flow of such resources. Such a group should give special attention to the need to apply increased resources to research in both industrialized and developing countries on energy sources offering alternatives to petroleum and nuclear power, especially those which can have most direct and practical application to developing country needs.

A particular example is the potential for wood from tropical forest areas to supply a major share of the energy needs of many developing countries. A special research programme designed to increase sustainable yields of useful products, including development of fast-growing tree varieties possessing symbiotic nitrogen-fixing bacteria, could do much to realize this potential. Accordingly, we recommend the establishment of one or more "Forest Energy Research Institutes" for this purpose, similar in size, mode of operation and support to the existing international agricultural research institutes.

All countries will be faced with difficult and complex trade-offs, involving the balancing of economic, social, environmental and security considerations in making their energy choices. Thus we recommend an immediate initiative to create a "world energy information system" to ensure that all countries, particularly in the developing world, have the benefit of the latest available experience and technical data for the purpose of their national energy planning. This could be based, at least initially, on existing United Nations information systems. Of special importance is the need for all countries to have access to the knowledge obtained by others of their national energy resources. Improving the system for dissemination of knowledge should be accompanied, moreover, by measures to encourage and facilitate its use.

The establishment of new "special purpose" organizations, combining mixes of private and public capital and know-how, offer a practical and promising means of meeting many particular energy needs and should be actively encouraged. Creation of lending consortia of commercial and development banks in particular regions, sharing the technical expertise that lending for energy development requires, is one example. Creation of specialized technical assistance corporations is another.

We are convinced that there are a number of important steps that developing countries themselves can and should take to strengthen their own positions and reduce their dependence on measures requiring prior agreement by industrial countries. These steps include a "compact" between oil-exporting and oil-importing developing countries, providing for extensive cooperation in effective utilization of the oil and capital resources of the exporters, on the one hand, and the agricultural and industrial potential, the markets, and the human

resources of the oil-importing countries, on the other. A Third World bank for energy development and a system of guarantees for foreign investments should also be initiated by collective action of Third World countries themselves.

Undeveloped hydro-electric power, much of it available from river systems that cross international boundaries, can make a significant contribution to meeting the needs of a number of developing countries. A concerted effort to promote the integrated development of international riverbasins would combine the utilization of hydro-electric power resources with a large-scale stimulus to agricultural and industrial development of many developing-country regions. While political difficulties cannot be underestimated, the incentives for doing this, both from the economic-development and regional-security points of view, are sufficiently strong to compel priority attention. Agreements reached by Brazil, Argentina, Uruguay, Paraguay and Bolivia for development of the Rio del Plata basin demonstrate that it can be done, and could serve as an example for other regions.

Finally, recognizing the unique character of nuclear energy and the common interest of all nations in ensuring against the use of its awesome potential for destruction, we call for resumption and intensification of the international dialogue aimed at ultimate internationalization of the nuclear fuel cycle, in line with the recommendations of the Pugwash Council on this subject in their statement to the Second Review Conference of the NPT. We believe that an essential component of this approach would be a policy of complete 'openness' of all operating facilities in the nuclear fuel cycle to international inspection and monitoring.

REPORT OF WORKING GROUP 6

SECURITY IN THE DEVELOPING WORLD

In 1980, the Pugwash working group on Development stated that 'developing countries are devoting an unreasonable proportion of their resources to armaments, in many cases solely for internal purposes, thus diverting resources from development needs'. In 1981, only a year later, the situation has worsened and the arms race, both in the developed and the developing world has taken a swing upward. The breakdown in communication and negotiation between opposing parties has become more profound and has led to a deepening sense of insecurity and the world-wide fear of nuclear war.

It is essential therefore to understand how nation-states perceive security. On the one hand, security is safe borders and territories free from external aggression; it is non-interference in the affairs of one country by another and respect for the right of nations and their peoples to manage their affairs in accordance with national interests. In the long term, security depends upon the implementation of international law and agreements that represent a stable world order. Fundamentally, security means the fulfilment of the human potential including the full enjoyment of basic human rights.

In the world of today, 'security' may become the justification of a ruling group to divert a substantial proportion of national resources under its control to armaments and military forces to the detriment of the development needs of the country.

Perceived insecurities may arise from many factors - national and international, such as economic conditions (poverty, economic stagnation and inflation, corruption, mismanagement, etc.), the competition for strategic resources (oil, phosphates, uranium, etc.), domestic struggles between ethnic and religious groups, the manipulation of the media. The Working Group concentrated on the impact of the US - USSR rivalry on the security perceptions of the developing world as well as on the increasing proportion of the world's resources devoted to the military. Associated with these developments is the accelerating arms trade in the developing world and the concomitant militarization on the one hand, and the fact that the arms trade once initiated generates a need to keep up with one's neighbours on the other. This self-generation is aided and abetted by the world's arms merchants or dominated by the major powers who for political and/or economic reasons encourage the purchase of arms.

The investment in arms is non-productive and diverts badly needed resources from a nation's capacity to meet basic human needs. A special, particularly grave, and frightening case of arms escalation is the continuing research and development of new and more sophisticated weapons by the superpowers. These weapons are most likely to be used in the Third World.

The increasing number of nations with the potential to produce nuclear bombs raises another threat to the developing nations. Nuclear war between the superpowers has been deterred by the existence on both sides of secure retaliatory capability. It will be very difficult and expensive for developing nations to acquire such retaliatory capability. A nation armed with limited nuclear weapons may in a period of tension come to think that a first strike would provide a great advantage in a situation in which a credible deterrent is non-existent.

The Group noted that mediation of local regional conflicts by bodies such as the Organization of African Unity (OAU) has been useful in resolving disputes.

The Working Group had an extensive discussion on the recent bombing attack of the reactor in Baghdad by Israel. This action has clearly created an unacceptable and dangerous precedent.

At the same time it was stressed that international measures are required to prevent nuclear proliferation of arms. These should include the following:

1. The nuclear superpowers should demonstrate by their own actions their willingness to reduce their nuclear arsenals and restore detente.
2. The NPT should be signed by all nations of the world.
2. Safeguard measures under the supervision of the International Atomic Energy Agency should be strengthened and other measures aimed at the prevention of diversion.
4. The Nuclear Suppliers should cooperate in implementing all agreed upon safeguard measures to ensure that materials and technological knowhow is not diverted from civilian to military purposes. (This may be especially difficult, since nuclear technology, like practically all technologies is a dual-purpose

technology, and one of the purposes may be difficult to disentangle from the other).

5. Next, the UN and Pugwash should carefully study the proposal that the enrichment, fuel processing and reprocessing plants should be operated internationally under safeguards of an international agency.

6. The collaboration of neighbouring countries in nuclear power programmes could also be a step towards assuring civilian rather than military use of nuclear knowhow.

Militarism, both in developed and less developed countries, should be rejected under its two guises: (1) as military regimes where power is in the hands of soldiers, resulting in the repression of dissenting groups in order to assure that political power remains in the hands of a ruling minority; and (2) in the form of military-industrial complexes and pressure groups whose financial and political interests, even in civilian regimes, are related to the perpetuation of international conflicts.

In conclusion the Working Group on security in the developing world recommends that:

1. The 1982 Working Group receive in advance as background, reports on militarization and development and on the arms trade in the developing world;

2. A Pugwash Symposium be organized on militarization and development. (The richness and breadth of topics discussed in this year's working group inspired the second recommendation. The scope of the proposed symposium should be broad, including economic, social, psychological, political and geographical aspects. The connection and the competition between militarization and development has not yet received adequate attention elsewhere, and seems particularly appropriate to be addressed within the context of Pugwash);

3. The Pugwash working groups which traditionally have dealt with technical and strategic questions of the nuclear arms race should be constantly aware of the impact of these questions upon the development needs of the Third World. Similarly, the development working groups should give high priority to the relationship between weapons and development.

4. It is recommended that a review of what has been written and done by Pugwash thus far on the subject of development be made, in order to provide guidance for future planning of its activities.

PAPERS PRESENTED AT THE CONFERENCE

(Requests for papers to be addressed directly to authors)

- H.M. Agnew *
Leasing, a solution to nuclear proliferation.
- U. Albrecht
The NATO missile modernization programme of 1979 in economic and technological perspective.
- F.S. Arkhurst
Africa: Militarization and the arms trade.
- A. Balevski *
In the name of common good and progress of mankind.
- J. Barnea
The availability of energy resources.
- E. Bauer
"Horrible, most horrible...".
- J.E. Beckman
Institute for Peace Technology (IPT).
- N. Behar
In search of more realistic formulae for International Disarmament Fund for Development.
- R. Bjornerstedt
The United Nations & Disarmament.
- G. von Bonsdorff
The process of disarmament.
- A. Boserup
Deterrence and defence.
- G. Brenciaglia
Energy resources and international security. The future of peaceful nuclear energy.
- M. Bruce & J. Rotblat
A World Energy Organization: its rationale and scope.
- R.B. Byers
Stemming the tide: proposals to cope with nuclear war-fighting doctrines and counterforce capabilities.
- E. Chivian
The assumptions of civil defence plans for nuclear war.
- E. Chivian
The history of International Physicians for the Prevention of War.
- O.R. Davidson
The utilization of alternative energy sources: implications for developing nations.
- F. Homer-Dixon #
Report on Canadian Student Pugwash to the 31st International Pugwash Conference.
- N. Dombey
International agreements on nuclear weapons - why they must be strengthened.
- F. El-Bedewi
Search for nuclear waste storage sites.
- V.S. Emelyanov
On natural resources and international security.
- W. Epstein
Freezing the nuclear arms race: The Canadian 'Strategy of Suffocation' and the CTB.
- W. Epstein
Proposal for a UN Special Session on international security.
- J. Yanney Ewusie
The crucial role of rural development management personnel in Africa - "The Pan-African Institute for Development".
- E. Fawcett
Human rights and international security.
- B.T. Feld
Nuclear proliferation.
- B.T. Feld
Whither arms control?
- S. Freier
Some comments on paper by E. Galal "Israel military and nuclear alternatives to peace".

- M.P. Fry
Measures to defend the ABM Treaty.
- E.E. Galal
Added hindrances to disarmament. A new race of force deployment, and arms sales.
- E.E. Galal
Israel military and nuclear alternatives to peace.
- Evamaria Garcia #
Control of armamentism in Latin America.
- R.L. Garwin
Launch under attack - kill or cure?
- H. Glubrecht
The beloved weapons.
- K. Gottstein
Avoiding conventional war.
- K. Gottstein
What kind of confidence can "Confidence Building Measures" be expected to build?
- W. Gutteridge
Enhancing international security.
- T.A. Halsted
Physicians and nuclear war: A US perspective.
- H.J. Harker *
Some positive thoughts on avoiding a new cold war: from enthusiasm to imposture, the step is perilous and slippery.
- O. Hoffmann-Ostenhof
Could we do more for a peaceful world?
- J.P. Holdren
Energy and international conflict: a working outline of problems and strategies.
- G. Ignatieff
Negotiating arms limitation and disarmament.
- A. Kahane #
Is there a place for airplanes in a UN Satellite Monitoring Agency?
- J. Kamsu Kom
Specific technology or at least "adapted technology" - not "transfer of technology" - a better start for durable peace.
- H.L. Keenleyside
Fear as the greatest obstacle to peace.
- C. Kiuranov
The neutron bomb: "I shall kill you".
- W. Bennett Lewis
How and what to salvage for the peaceful uses of atomic energy.
- Birgitta Linner
Women - Development - Security.
- P. Lock
Biased perceptions and distorted views: the creation of a more peaceful new International Economic Order requires new concepts and more adequate indicators in the social sciences.
- J.V. Luco
Man as the environment.
- S.J. Lundin
Possible use of the concept of verification by challenge for a chemical weapons convention.
- P. Meincke
The effect of technological choice on international stability in the developing world.
- D.L.O. Mendis
Conservation farming.
- J. Nishikawa
An approach to meet world-wide issues - changing nature of the UN system and its implication on international relations.
- I. Ogawa
Aims and experiences of nuclear education at a university.
- S.E. Okoye
World poverty - the ultimate doomsday bomb.

- N.A. Plate
Non-military CBMs.
- J.C. Polanyi
An international satellite monitoring system (ISMOS).
- J. Primack
A desirable unilateral arms control: abolition of the US airforce.
- M.H.L. Pryce
Some Canadian proposals for disposal of spent nuclear fuel.
- R.W. Reford
Arms control in the arctic: problems and prospects.
- A. Garcia Robles
The role of the 1982 UN Special Session on Disarmament.
- Rita R. Rogers
Soviet-US relationship under nuclear umbrella - a psychopolitical perspective.
- H. Schneider
Some trivial remarks on what is to be noticed and what is to be done.
- H. Scoville, Jr.
Countersilo weapons - invitations to nuclear war.
- Jane M.O. Sharp
New goals for arms control.
- G.L. Sherry
Enhancing international security - the role of the United Nations.
- L.B. Siemens
Impact of food shortages in the developing countries on international security.
- Ph. B. Smith
Getting the military consequences of overkill across to governments and people.
- F.G. Sommers
The Cold War: A personal experience in a psychiatric perspective.
- I. Susiluoto
Crisis management and crisis in management: elements in superpower contest.
- M.M. Thomson
Creating a constituency for disarmament.
- H.A. Tolhoek
On the development of ideologies in East West: detente or confrontation?
- E.L. Tollefson
Bitumen and heavy oils as alternative fuels that are available in quantity in many countries.
- T. Toyoda
Proposals to the 2nd UN Special Session on Disarmament.
- V.G. Trukhanovsky
The Indian Ocean and the Persian Gulf Area: continued rise of the war danger.
- R. Vukadinovic
Conflicts between non-aligned countries and possible modes of their settlement.
- M. Vuorio
Dangers of possible Ballistic Missile Defence by laser satellites.
- H. Wulf
Economic relations and detente: results and consequences of embargoes.
- T. Wulff
International humanitarian law as a means to promote international peace and security.
- El Sayed Yassin
Can military strength be equated with security? The dilemma of the Israeli political-military doctrine.
-
- * unable to attend
- # student participant

Professor H. Yukawa - An Appreciation

Hideki Yukawa, one of the founders of the Pugwash Movement, died in Kyoto, Japan, on 8 September 1981, at the age of 74 years.

Professor Yukawa was a theoretical physicist of world renown. At the young age of 26 he formulated a theory of the interaction between nucleons via an intermediate particle, the meson. For this work he was awarded the Nobel Prize for Physics in 1949. He made many more contributions to the understanding of fundamental particles and fields of force, as well as creating an important school of theoretical physics, in his posts of Professor of Physics at the University of Kyoto and Director of the Research Institute for Fundamental Physics. He received many honours for his scientific achievements and became one of the most respected figures in Japan.

Professor Yukawa was also respected and admired for his vigorous stand against nuclear weapons and the evils of war in general. In particular, he was convinced that scientists have the moral duty to speak up clearly on these issues. He was largely responsible for organizing the scientific community in Japan in the campaigns against nuclear weapons. For the same reason he responded with alacrity to the invitation to become a signatory of the Russell-Einstein Manifesto. His influence has secured the financial support from Japanese sources which enabled him and two other Japanese scientists to participate in the First Conference in Pugwash in July 1957. He subsequently attended the Kitzbuhel Conference in 1958 and the Cambridge and London Conferences in 1962. Failing health made it difficult for him to attend later Conferences, but he continued to take an active part in the work of the Japanese Pugwash Group. In 1975 he was the host to the 25th Pugwash Symposium in Kyoto, under the title "New Design for Nuclear Disarmament" which has resulted in a Pugwash Monograph.

Yukawa held very strong views about the necessity to aim at general and complete disarmament and about the folly of becoming preoccupied with the small steps of arms control. He challenged the whole concept of nuclear deterrence, which, he believed, was an obstacle to nuclear disarmament. In a paper presented at the Kyoto Symposium he argued that if the superpowers based their policy on the concept of nuclear deterrence then "both will constantly receive a positive feedback, which means that the nuclear armament of both sides is directed towards infinity. This is the complete opposite of nuclear disarmament, which is in principle directed towards zero,... (and is) a process of repeated negative feedback". He continued this theme in the last message which he sent to the Pugwash Conference in Breukelen on the occasion of the 25th Anniversary of the Russell-Einstein Manifesto: "One of the fundamental causes for the present awful situation of the arms race... is that we have rejected as unrealistic the original idea of Bertrand Russell that nuclear weapons are an absolute evil and must be eliminated... I appeal to all of you as Pugwashites to make a fresh start based on the original idea of the Russell-Einstein Manifesto, and cooperate to implement it however difficult it may be".

In all spheres of his activities Professor Yukawa's personality shone with gentleness and consideration for others. His death deprived the world of an eminent scientist, a great humanitarian and a staunch campaigner for peace.

J.R.

CALENDAR OF FUTURE MEETINGS

1981

11-12 December
Geneva, Switzerland.

Fifth Workshop on SALT and Nuclear Forces in Europe.

Agenda:

1. Specific steps for stopping and reversing deployment of nuclear forces in Europe.
2. Linkage of item 1 with the SALT process.

12-13 December
Geneva, Switzerland.

Second Workshop on Averting Nuclear War: the Role of the Media,

Agenda:

1. The accelerating arms race in Europe.
2. The Middle East and other crisis situations in the Third World.
3. The spread of nuclear weapons beyond present nuclear powers.
4. The role of the media in crisis prevention and crisis management.

1982

19-23 February
Corsica, France.

Symposium, in Collaboration with UNESCO, on Scientists, the Arms Race and Disarmament.

12-14 March
Prague, Czechoslovakia.

Ninth Workshop on Chemical Warfare.

May/June (tentative)
Oslo, Norway.

Symposium on a Nuclear Free Zone for Northern Europe.

26-31 August
Warsaw, Poland

32nd Pugwash Conference.
(Agenda on p.96)

1983

August
Sri Lanka.

33rd Pugwash Conference.

32nd Pugwash Conference, Warsaw, 26-31 August 1982

Topic Headings of Working Groups

1. Problems and Prospects of Soviet-American Nuclear Arms Control
 2. Contemporary Issues in European Security
 3. Controlling Specific Destabilizing Weapons Technologies
 4. Nuclear Proliferation
 5. Energy and Security for Industrially Advanced and Less Developed Countries
 6. Arms Acquisition and Economic Development in Less Developed Countries
 7. Current Conflicts
 8. The Role of Scientists in Defence Industries, Arms Control and Disarmament.
-

RECENT PUBLICATIONS

Contemporary Terror - Studies in Sub-state violence. Edited by: David Carlton and Carlo Schaerf. MacMillan Press 1981. Price £20.00.

This is the first volume of the papers presented at the International School on Disarmament and Research on Conflicts (ISODARCO), held in Ariccia, in August 1978. The second Volume under the title: "The Hazards of the International Energy Crisis" is to be published shortly.

The Final Epidemic - Physicians and scientists on the medical and environmental consequences of nuclear war. This book is published by the Bulletin of the Atomic Scientists and costs \$4.95. It contains a collection of articles on the ultimate medical emergency - nuclear war. The contributors include: Herbert L. Abrams, Helen M. Caldicott, Eugene I. Chazov, John D. Constable, Bernard T. Feld, Stuart C. Finch, Roger Fisher, John Kenneth Galbraith, H. Jack Geiger, Howard H. Hiatt, John D. Isaacs, Peter G. Joseph, George B. Kistiakowski, Robert Jay Lifton, Patricia J. Lindop, Bernard Lown, John E. Mack, J. Carson Mark, Joseph Rotblat, Herbert Scoville, Jr., Victor W. Sidel, and Kosta Tsipis.

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