January 1979 Volume 16 No. 3

Pugwash Newsletter

issued quarterly by the Council of the Pugwash Conferences on
Science and World Affairs

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

Vol. 16 No. 3 January 1979

Editor : Dr. M.M. Kaplan
9 Great Russell Mansions
60 Great Russell Street
London WC1B 3BF, England

C O N T E N T S

Reports of 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.

ABOUT MID-DECEMBER

It seemed but yesterday that we in the Executive Committee were together in the warm climate of Varna. Reconvened in mid-December, and faced with the chilly rain and sleet of Geneva, we drew benefit at the start from many interesting features of the just completed workshop on Political and Psychological Aspects of Crisis Management and Prevention.

The report of the workshop (p. 62) reflects the substance of the discussions, but some background needs filling in. Our Swiss hosts, led by Christian Dominicé and Jacques Freymond, provided their traditional gracious hospitality. This was the fourth Pugwash workshop in Geneva during the past eight years. The workshop was held at the lakeside chateau housing the Institut Henri Dunant, named after the founder of the International Red Cross, and one session was held at the nearby headquarters of that organization.

Dave Hamburg, who chaired the workshop, steered the discussions with great art through Cuban waters, the Sinai desert, Vietnam highlands and other geographical spots, to push-buttons on consoles in Washington and Moscow. And as in all Pugwash meetings, the opportunity for and the results of private discussions between participants were often as important as what appears in the written report.

The Executive Committee then settled down to its job of reviewing critically where we are, and of charting our near and more distant future. Unanimity was not possible - nor perhaps desirable - on such issues as the relative weight to be given as between economic development of the poor countries (and the consequent contribution to world stability) and arms control and disarmament, or to what degree Pugwash should "go public". The tone of discourse was, as always, passion tempered with respect, and there was agreement to disagree on certain issues until a better resolution might be arrived at by the time of the next session in Vienna in March.

The Executive Committee reviewed the forthcoming meetings during the first six months of 1979 in Vienna, Helsinki and Stockholm (b.cover) and then concentrated on the annual Conference in Mexico City next July. As the letters of invitation show, preparations for the Conference will, we hope, ensure a high quality of background documentation and working papers, so that the discussions of working groups will be more sharply focussed and productive than has been the case in some recent Conferences. Also, the Mexican Pugwash Group are exerting unusual efforts to ensure the participation of leading experts on security problems of developing countries - a major theme of the Mexico Conference - knowing that there will be no lack of individuals knowledgeable on security issues affecting the superpowers and other industrialized countries.

The concern with preparations for the Mexico Conference reflects criticisms which have been levelled at previous Conferences, especially with respect to papers submitted for discussion. Part of the difficulty has been the wide range of topics covered in Conferences, as opposed to the more narrowly focussed symposia and workshops. In discussing this question, the Executive Committee noted that all items, and especially sub-items, of the agenda need not necessarily be covered. Only those topics will be considered for which the necessary expertise of participants is available, and where the views have been adequately set forth in a written submission. Substance, originality and brevity should characterize submissions, rather than long-winded platitudes which often befog the atmosphere of sessions of the United Nations. The Mexico Conference holds great promise for improvement in this respect.

M.M. Kaplan

PUGWASH WORKSHOP ON POLITICAL AND PSYCHOLOGICAL ASPECTS OF CRISIS MANAGEMENT AND PREVENTION

Institut Henri Dunant, Geneva, 13-15 December 1978

Agenda

1. Background of the problem: factors that increase, maintain, or diminish international tension.
2. High-level decision-making. Recent studies of cases bearing on international conflict.
3. Technological and other safeguards on governmental, civilian and military decisions on "command and control" of possible use of nuclear and other weapons of mass destruction.
4. Crisis management:
   a. Effects of stress on decision-making and how to cope with them
   b. Perceptions of the adversary
   c. Communication with the adversary
   d. Assuring adequate consideration of non-violent options.
5. Crisis Prevention.

List of Participants

Dr. H. Afheldt, Max-Planck-Institut, Riemerschmidstrasse 7, D-813 Starnberg, F.R.G.
Prof. G. Allison, Kennedy School of Government, Harvard University, Cambridge, Mass. 02138, U.S.A.
Dr. H. von Arx, Département politique fédéral, Palais fédéral Ouest, 3003 Berne, Switzerland.
Mr. R. Aubrac, Centre de Recherches pour de Développement international, 12 rue de Berri, 75008 Paris, France.
Mr. E. Bauer, Institut National des Sciences et Techniques Nucléaires, B.P. No. 6, 91990 Gif-sur-Yvette, France.
Dr. R. Bogdanov, Institute of the USA and Canada, Academy of Sciences of the USSR, 2/3 Khlebny per, Moscow 121069, U.S.S.R.
Prof. F. Calogero, Istituto di Fisica, Universita di Roma, Piazzale delle Scienze 5, 00185 Roma, Italy.
Mr. J. Cuendet, Département politique fédéral, Palais fédéral Ouest, 3003 Berne, Switzerland.
Prof. C. Dominicé, Institut Universitaire de Hautes Etudes Internationales, 132 rue de Lausanne, 1202 Geneva, Switzerland.
Prof. B.T. Feld, Department of Physics, Massachusetts Institute of Technology, Cambridge, Mass. 02139, U.S.A.
Prof. J.D. Frank, Johns Hopkins University School of Medicine, Johns Hopkins Hospital, Henry Phipps Psychiatric Clinic, 601 N. Broadway, Baltimore, Maryland 21205, U.S.A.
Prof. J. Freymond, Institut Universitaire de Hautes Etudes Internationales, 132 rue de Lausanne, 1202 Geneva, Switzerland.
Prof. E.E. Galal, Pan-African Pugwash Group, 4 Mohamed Mazloum Street, Cairo, Egypt.
Prof. C. Gasteyger, Institut Universitaire de Hautes Etudes Internationales, 132 rue de Lausanne, 1202 Geneva, Switzerland.
Prof. A.L. George, Department of Political Science, Stanford University, Stanford, California 94305, U.S.A.

Prof. D. Hamburg, Institute of Medicine, National Academy of Sciences, 2101 Constitution Avenue, Washington, D.C. 20418, U.S.A.
Dr. J. Handler, Pugwash Conferences, 11A Avenue de la Paix, 1202 Geneva, Switzerland.
Dr. M.M. Kaplan, Pugwash Conferences, 11A Avenue de la Paix, 1202 Geneva, Switzerland.
Prof. H. Marcovich, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France.
Acad. M.A. Markov, Academy of Sciences of the USSR, Leninsky Prospekt 14, Moscow V-71, U.S.S.R.
Prof. M. Nalecz, Palac Kultury i Nauki, p. 2318, 00-901 Warsaw, Poland.
Prof. L. Pastusiak, Instytut Badań Wspolczenych Problemow Kapitalizmu, Al. Jerozolimskie 125/127, 02-017 Warsaw, Poland.
Dr. Rita Rogers, Harbor General Hospital, 1000 West Carson Street, Torrance, Ca.90509, U.S.A.
Prof. J. Rotblat, 8 Asmara Road, London NW2 3ST, U.K.
Dr. N. Sartorius, Division of Mental Health, World Health Organization, 1211 Geneva 27, Switzerland.
Dr. J.D. Singer, Mental Health Research Institute, 205 Washtenaw Pl., Ann Arbor, Mi. 48109, U.S.A.
Prof. V.G. Trukhanovsky, Medvedeva Street 12/6, Flat 31, Moscow K-6, U.S.S.R.

Introduction

The frame of reference for the Workshop was as follows:

"Pugwash has given particular attention to problems of international tensions and conflicts. Recent developments on the international scene are giving rise to great concern, since they threaten peace and attempts at détente and to improved international relations in general. Very serious consequences, perhaps leading to generalized war and the use of nuclear and other weapons of mass destruction, can result unintentionally during acute crises which have developed from a cumulative and often synergistic series of events. The purpose of the Workshop is to examine major factors - political, psychological and technical - that are operative in such crises and to determine relevant steps that could be taken to defuse them, as well as to determine measures for preventing opposing viewpoints from reaching a flash point of armed conflict. The agenda topics are highly complex and cannot be covered adequately in one meeting. The Workshop will attempt to identify critical points and issues in each of the topics. If this is successfully accomplished, a series of Workshops could be envisaged for further in-depth analyses of specific elements."

Report

Is is useful to put contemporary crisis situations in a long time perspective and a broad context of world wide experience. In this way, we can be more objective in our approach to these exceedingly difficult and emotionally charged problems.

The time-scale of evolution highlights a dilemma in the current predicament of human societies. There have been mammals on earth for more than seventy million years. A manlike form has been present for several million years; modern man has been in existence for about 50,000 years, and the industrial revolution occurred about 200 years ago. On an evolutionary time-scale, the world we live in is mainly one that we have made for ourselves very recently.

Problems that concern us so urgently today are, for example, the enormous population growth, the negative consequences of urbanization, environmental damage and resource depletion, development, the risks of weapons technology, and new patterns of disease. Some of the main features of the contemporary environment are products of recent developments, much of which has taken place within the memory of living adults. Natural selection shaped our ancestors in ways that suited earlier environments over millions of years. We are still learning how to adapt our individual behaviour and social institutions to modern conditions. The most dramatic of all these changes, and the most difficult adaptation, involves the prevention of nuclear war, and the tens or even hundreds of millions of deaths that would ensue - a figure more difficult to grasp by individuals than deaths in a family.

In contemporary societies, conflict between groups is common and varied in content. Yet there are widely shared properties in the form of such antagonisms that may help us to understand some difficulties in the way of improving cooperation among nations. Human societies have a pervasive tendency to make distinctions between people perceived as good and bad, between heroes and villains, between in-groups and out-groups. This tendency is very widespread, readily learned, and susceptible to a harsh dichotomy between positively valued "we" and negatively valued "they".

Hostility between human groups is likely to arise when the groups perceive a conflict of vital interest, an unacceptable difference in status, or a difference of beliefs that jeopardizes self-respect. Such situations tend to evoke sharp in-group out-group distinctions, with drastic depreciation of the out-group by the in-group. Justification for harming out-group members (e.g. other nations) rests on sharp distinctions between "we" and "they", between good people and bad people. Such justification is readily provided by assumptions regarding: (1) the damage they would do to the in-group (the definition of self-defence can become so broad as to justify almost any destructive action), and (2) classification of the out-group as essentially non-human.

A great variety of political, social, and economic ideologies may be mobilized in support of these hostile positions. This view of life based on one's own group has been studied by social scientists and usually referred to as "ethnocentrism". It may be thought of as an extension of "egocentrism". It seems easy for most of us to put ourselves at the centre of the universe, attaching strong positive value to one's self and one's group, while attaching negative value to many other people and their groups. In studies of "ethnocentrism", groups have been specified by religion, race, language, region, tribe, nation, and various political entities. The same principles seem to apply across these various groups. A crucial question is whether groups can achieve internal cohesion and self-respect without promoting hatred and violence towards other groups. A deeper understanding of factors that exacerbate and ameliorate ethnocentrism could have great practical value in resolving inter-group conflicts in the future. These are world-wide problems, probably manifested in some degree in every nation. It is prudent to assume that we all are, to some extent, susceptible to egocentric and ethnocentric tendencies. It is part of common humanity - and it is dangerous.

A common but potentially lethal aspect of inter-group and especially international conflicts is the tendency to blame other groups for the dissatisfactions of one's own, and ultimately (though not necessarily) to justify great harm to them in terms of such blame. This tendency impedes rational analysis and constructive problem-solving. It is essential that crisis management and crisis prevention be analytical rather than polemical.

Various definitions of crisis have been employed. For the purposes of this Workshop,

the most useful one views crisis as an accelerating chain of political and psychological events leading nations to the brink of war. Usually, these events are characterized by a strong threat to important values on both sides and by the perception of a short time available for crucial decisions. Often, though not necessarily, the circumstances also involve surprise for one or both parties. All of these characteristics contribute to a sense of urgency on policy makers.

To give our discussion a more concrete focus, we turned to the prime example of nuclear crisis management in the past 33 years: the Cuban missile crisis. A film made for American TV served as a reminder of the event. It helped the Workshop to address three central questions: (1) Can there develop situations in which leaders of both governments contemplate actions that set in motion events that could lead to "blowing up the world"? (2) In situations where leaders perceive a real chance of nuclear war, can those crises be successfully managed? (3) How can such crises be avoided?

Decision-Making

The Workshop considered decision-making under stress in a variety of contexts, especially leadership in a crisis involving a high risk of escalation toward nuclear war.

Political leaders in a crisis operate under major limitations: (1) incomplete information about the situation; (2) inadequate knowledge of the relation between ends and means - thus the leader cannot predict with confidence the consequences of choosing a given course of action; and (3) difficulty in formulating a single criterion for use in choosing the best available option. In such a setting, strategies for dealing with cognitive complexity become essential. These difficult situations typically pose multiple stakes for the decision maker that cannot readily be reconciled.

A national leader must consider his national interest. He must also often weigh the interests of his political group, various special interest groups, the lives of many unknown individuals, as well as his own family and his sense of worth as a person. The leader can today elicit more relevant information and more potent analytical capabilities than ever before. But as we know from painful experience, these potentialities for effective problem-solving fall short of expectations in actual practice. The Workshop examined some ways in which the potentiality of reasonable, well-informed decision-making can actually be achieved in difficult real-life circumstances.

A major theme in studies of small advisory groups and of the larger organizational context in which leaders make decisions has to do with the strong advantages of explicitly considering a wide range of alternatives, including unpleasant ones, before making a major decision. An important line of enquiry that has practical bearing on leadership decisions is to clarify the factors in small advisory groups and large organizations that tend either to inhibit or to facilitate a consideration of multiple alternatives. But many institutional arrangements and semi-perpetual crisis atmospheres do not foster such rational problem-solving. We must pay attention to organizational interventions that can systematically strengthen a leader's problem-solving capacity. For example, leaders need organizational early warning systems. Because it is so difficult under most stressful circumstances to make anything like an optimal decision, there is an urgent need for monitoring the course of the transaction with the environment in such a way as to detect untoward consequences as they are beginning to appear, but before they are irreversible.

While international crises are caused by a multiplicity of economic, strategic, political

and other factors, psychological issues have traditionally been neglected in analysing such problems. Psychological factors may be useful in practical assessment of crisis situations. Special attention might be given to: emotional vulnerabilities of the parties in conflict; whether the current situation inflames old vulnerabilities, and if so how; major characteristics of the main decision-makers; and appraisal of the situation from the adversary's perspective. The desirability of protecting the self-respect and dignity of leaders and peoples on both sides is noteworthy. Traditional concepts of "victory" are largely obsolete and misleading.

Effects of extreme stress on information processing pertinent to crisis decision-making

I. Reduced span of attention: (1) important dimensions of the situation may escape scrutiny; (2) conflict of values may be overlooked; (3) the range of perceived alternatives is likely to narrow, but not necessarily to the best alternatives; (4) "search" tends to be dominated by past experience, and a tendency to misapply the lessons of past experience.

II. Cognitive rigidity: (1) reduced creativity and impaired ability to improvise; (2) reduced receptivity to new information that challenges existing beliefs; (3) stereotypic thinking; (4) reduced tolerance for ambiguity.

III. Time perspective: (1) shorter time perspective which may result in less attention to longer-range consequences of options and to side-effects of options.

In view of the stabilizing role that an informed public opinion should play, we need to know much more about how information management operates in specific crisis situations. This is important for increasing our understanding of the impact of news on the general public in both developed and developing countries. We therefore encourage research on this subject.

For more immediate purposes, an appropriate Pugwash activity might be to convene a meeting of senior officials of mass media organizations such as major news agencies (Reuters, Agence France Presse, Tass, Associated Press, United Press International etc.), and audio-visual networks. Discussion could centre on information flow during specific crises (escalating to the brink of war) and what could be done to dampen and reverse such crises.

Crisis prevention requires broader considerations than crisis management.* Since the image of the enemy is a major psychological obstacle to world peace, steps toward this distant goal must involve creation of conditions that serve to inhibit the formation of this image or dispel it once it arises. In this connection, it is encouraging that the perceptions that citizens of nations have of each other can change as relations between their nations change. This has been demonstrated by a series of public opinion surveys in the United States over several decades.

Social science and related technology have created two new, potentially powerful, means of inhibiting formation of hostile enemy images: expansion of communication, and international collaboration toward goals that cannot be achieved by the efforts of one side alone. Air travel has enormously facilitated face-to-face communication by different

---

* It should be noted that Article 99 of the UN Charter states: "The Secretary-General may bring to the attention of the Security Council any matter which in his opinion may threaten the maintenance of international peace and security."

nationals. Communication satellites enable the same radio or television message simultaneously to reach all the peoples of the world, even down to inhabitants of small villages. Such media, moreover, overcome the barrier of illiteracy, and have much greater emotional impact than the written word.

But mass electronic communication is only a means; it cannot resolve the genuine conflicts of interest underlying many international disputes. But is has great potential for fostering attitudes that increase chances for peaceful solution of such conflicts. Already the "hot line" and surveillance satellites have helped to reduce tensions between the United States and the Soviet Union by yielding more accurate information as to the intentions and capabilities of each.

Experiments by social psychologists have shown that a powerful means of reducing antagonism between adversaries lies in enlisting their cooperation toward a goal that both sides desire but neither can achieve alone. One such goal is survival itself. All nations are threatened by nuclear weapons. Unfortunately, the human propensity for "denial" minimizes the believability of this threat, and it is difficult so far to assess its utility.

Modern science and technology have created new projects that require international cooperation. An important goal that can be achieved only by international cooperation is the halting of destruction of the biosphere by industrial and nuclear wastes. Exploration of outer space and of the world under the seas also holds promise for fostering international collaboration. Pugwash years ago published proposals for many collaborative international scientific projects that hold potential for gains in human welfare. Such projects might now be re-assessed and updated.

The view was expressed that the more organized is international cooperation and the stronger the trend towards détente, the more the majority of conflicts will tend to become intra-state and intra-society affairs, that is they will be national and not international problems. At present, national conflicts tend to be transformed into international conflicts, and local conflicts tend to draw in nuclear powers. These relations require close examination.

In attempting to assess the dangers of nuclear war, command and control systems were briefly considered. The trend of actions over the years has been towards tighter controls. As the nature of nuclear conflict becomes more awesome, the attention to command and control increases, more constraints are imposed, and more redundancy is created. The possibility exists that this crucial technology should be transferred among nuclear powers. Truly effective command and control systems might help to prevent a nuclear war. The human factors in such systems must be carefully considered and periodically re-assessed.

Multiple mechanisms are needed to manage, let alone prevent crises. There is no single or simple answer. We need to clarify further those factors which are most relevant to the escalation and control of the conflict process, and to suggest some short-run adjustments which might keep such conflict within tolerable bounds. Such activities are a logical outgrowth of Pugwash's previous interests and accomplishments.

The foregoing considerations contribute to specific formulations of crisis prevention and crisis management. In the remainder of this report we undertake a tentative formulation of key factors pertinent to management and prevention, and also offer some specific examples in which these concepts might be useful.

Crisis management: key conditions

Several participants in the Workshop emphasized that effective crisis management requires: (1) appropriate military capabilities and options; (2) effective command and control; and (3) advance planning.

Confrontations involving the USA and USSR create the danger of escalation to nuclear war, as in the Cuban missile crisis, insofar as neither side may wish to back down quickly or completely, and because both sides may mobilize forces and make threatening moves in order to demonstrate resolution and to coerce the other side into backing down.

If escalation is to be avoided under these circumstances both sides, even while engaged in efforts to coerce each other, must also cooperate in crisis management. Analysis of the Cuban missile crisis indicates that both sides did indeed understand the requirements of crisis management and were able and willing to act in accordance with them.

Some of the requirements for crisis management that were evident in this crisis included the following:

1. Above all, top-level civilian control over the selection and timing of military actions, extending even to specific tactical operations that might lead to a clash with the opponent's forces.
2. The deliberate slowing down of the momentum of military movements to provide enough time for exchange of diplomatic communications and to give the opponent adequate time for making decisions.
3. Careful coordination of military movements with political-diplomatic actions.
4. Avoidance of military movements and actions that do not provide clear and appropriate demonstrations of political objectives.
5. Avoidance of military actions that confront the opponent with an urgent requirement for escalation.
6. Choice of military movements and actions that signal a desire to negotiate a way out of the crisis rather than to seek a military solution.
7. Choice of military actions and diplomatic proposals that leave the opponent the option of a way out of the crisis compatible with self-respect.

Further study is needed to refine and elaborate our present understanding of the requirements for crisis management. Other crises should also be studied from this standpoint.

Crisis Prevention (United States and Soviet Union)

It was noted that the USA and USSR have already formally committed themselves to cooperate as necessary to prevent dangerous crises from arising into which they might be drawn. In the "Basic Principles" agreement which Brezhnev and Nixon signed on 29 May 1972, the two sides stated they "attach major importance to preventing the development of situations capable of causing a dangerous exacerbation of their relations. Therefore, they will do their utmost to avoid military confrontations and to prevent the outbreak of nuclear war...". Continuing, Brezhnev and Nixon recognized "that efforts to obtain unilateral advantage at the expense of the other, directly or indirectly, are inconsistent with these objectives", and they further committed themselves "to do everything in their power so that conflicts or situations will not arise which would serve to increase international tensions."

A year later, in the agreement on the Prevention of Nuclear War (signed on 22 June 1973), Brezhnev and Nixon agreed that the USA and USSR "will act in such a manner as to

prevent the development of situations capable of causing a dangerous exacerbation of their relations, as to avoid military confrontations, and as to exclude the outbreak of nuclear war between them...".

They agreed, further, that in the event such potentially dangerous situations seemed to be developing "the United States and the Soviet Union, acting in accordance with the provisions of the agreement, shall immediately enter into urgent consultations with each other and make every effort to avert this risk." The importance of crisis prevention was also emphasized in the Helsinki agreement. It was also emphasized that the most important and urgent step towards the prevention of nuclear war is progress in arms control, in particular the early conclusion of a SALT agreement and its follow-up by effective measures of nuclear disarmament.

The question was raised at the Workshop whether and to what extent the two sides had attempted to implement their general agreement on the necessity for crisis prevention, with specific reference to the onset of the Arab-Israeli war of October 1973 or in other situations. The Workshop also discussed the desirability and feasibility of strengthening the USA-USSR crisis prevention regime, and also the possibility that Pugwash might sponsor some kind of enquiry aimed at identifying ways of strengthening the USA-USSR crisis prevention regime. During the discussion of the proposal Workshop participants called attention to the need to take the interests of other countries into account, and to ensure their participation and cooperation. In this connection it was noted that the Basic Principles agreement attempted to meet this concern by offering various assurances, including the following: "The development of United States-Soviet relations is not directed against third countries and their interests." This assurance should be honoured in any cooperative measures undertaken by the USA and USSR to strengthen and implement their crisis prevention regime.

Pugwash might undertake useful activities in this field.

List of Papers Prepared for the Workshop

G. Allison (USA)	The Missiles of October (a film presentation)
E. Bauer (France)	We Don't Know How War Begins
J.D. Frank (USA)	Determinants and Consequences of the Image of the Enemy
D. Frei (Switzerland)*	Some Questions for Discussion on Agenda Item 4.
E.E. Galal (Egypt)	Information Management and Control in Crisis Management
A.L. George (USA)	Towards a Crisis Prevention Regime in U.S.-S.U. Relations
I. Kende (Hungary)*	Some Factors that Increase and Diminish Tensions of Our Days
G.E. Miller (USA) *	Existing Systems of Command and Control (prepared for the Pugwash Toronto Symposium 1978)
Rita R. Rogers (USA)	Political and Psychological Aspects of Crisis Management and Prevention
J.D. Singer (USA)	Positive Feedback, Negative Feedback and the Escalation of International Conflict.

* Unable to attend meeting.

Requests for copies of papers should be addressed to the author.

PUGWASH GUIDELINES FOR INTERNATIONAL SCIENTIFIC COOPERATION FOR DEVELOPMENT

Note: An interim draft of the Pugwash Guidelines for International Scientific Cooperation for Development was published in the April 1978 issue of the Newsletter. The Pugwash Executive Committee, at its session on 16 and 17 December 1978, discussed and approved a final text which is reproduced below.

Foreword

Work on the text of the Pugwash Guidelines for International Scientific Cooperation for Development was begun at an international Pugwash Workshop on this subject held at Badkal Lake, Haryana, India, 11-14 January 1978. The resulting draft was entrusted to a Steering Committee* to continue work on the document until a final text would be approved by the Pugwash Council or its Executive Committee for submission to the United Nations Conference on Science and Technology for Development (UNCSTD) to be held in Vienna, 20-31 August 1979.

The Badkal draft was reviewed by a Pugwash Workshop on the 1979 UNCSTD held in Rabat, Morocco, 20-22 April 1978, and by a working group at the 28th Pugwash Conference held in Varna, Bulgaria, 1-5 September 1978. Also, comments were received from many individuals of the world scientific community interested in international scientific cooperation, involving in all over 60 scientists from 35 countries. Their suggestions for modifying the draft were received with appreciation by the Steering Committee, and were taken into account in its work. The final text, reproduced in the present document, has been reviewed and approved by the Pugwash Executive Committee for transmission to the Secretary-General of UNCSTD.

December 1978

---

* Members of the Steering Committee:

Prof. E. E. Galal (Egypt)
Dr. M. M. Kaplan (USA)
Prof. C. H. G. Oldham (UK)
Prof. B. M. Udgaonkar (India)
Dr. M. S. Wionczek (Mexico)

1. PREAMBLE

1.1 Science and technology provide the tools to help banish poverty, ignorance and destitution from the face of the earth. This potential could be very significantly enhanced by concrete steps towards disarmament. Thus disarmament and development, the two major concerns of Pugwash, are inextricably linked.

1.2 When the 1963 UN Conference on Science and Technology for the Benefit of Less Developed Areas was held in Geneva, it was widely believed that a massive transfer of science and technology (S and T) from the developed countries (DCs) would rapidly reduce poverty, hunger and disease in the developing countries (LDCs) of the world. This view has proved to be wrong.

1.3 Access to the technology of the DCs has been found to be much more difficult than was envisaged at that time. Awareness of the constraints arising from a divergence of interests of the parties, whether real or apparent, and from the structural and operational incompatibilities in the international system is now growing. Enormous gaps separate many of the LDCs from the DCs. Most LDCs have no significant scientific and technological infrastructure of their own, and have therefore generally been unable to generate the technologies needed by them. Even more serious has been their difficulty, due to lack of trained and experienced manpower, to assess, select and acquire on equitable terms suitable technologies from the DCs, or to adapt and assimilate these technologies. LDCs note with concern the increasing pressures in the DCs with market economies to put bans on export of technology, materials, and equipment components, and are worried that technology may be used as an instrument of global domination. Unfulfilled expectations and continuing dependence of LDCs on DCs has led to widespread disillusionment among LDC scientists with past efforts at cooperation. The creation within LDCs of capabilities to enable them to face the complexities of international cooperation in S and T on an equal footing with the DCs is now recognized as a prerequisite for successful cooperation between the developing and developed countries.

1.4 Thus, in the closing years of the Second Development Decade, and on the eve of the 1979 UN Conference on Science and Technology for Development (UNCSTD), a consensus is emerging to the effect that the LDCs must build up an autonomous capability for problem solving, decision-making and implementation in all matters relating science and technology to development. This capability, which is the essence of self-reliance, includes the capacity to adapt, generate, utilize and diffuse S and T knowledge relevant to indigenous development objectives. Since the LDCs cover a wide spectrum of countries at various stages of development, and the achievement of self-reliance in S and T at the national level will not be feasible for many of them, such national efforts have to be reinforced by regional and inter-regional cooperation between them for collective self-reliance.

1.5 The DCs can assist this process through genuinely collaborative S and T projects with the LDCs. In the past, such projects have often been fragmentary in character, uncoordinated with other projects, or not integrated with overall socio-economic development efforts or with the S and T priorities of the LDCs concerned. Thus, while such endeavours might have helped to create or to strengthen some S and T institutions in LDCs to train high-level S and T manpower, to generate new knowledge and to apply it with existing knowledge to certain developmental problems, they have not by and large contributed significantly to the strengthening or building of local self-reliance in S and T. At times, these collaborative projects even appear to have benefited the interests of the DCs more than the LDCs, and have also occasionally led to misunderstandings, abuses and conflicts.

1.6 The possibilities of fruitful international S and T cooperation are limited by the fact that an important sector - almost one half - of the scientific and technological manpower in the DCs is involved in research and development (R and D) for the military, or works for transnational corporations (TNCs). LDCs are deeply concerned that their national development objectives could be adversely affected by international collaboration involving scientists and technologists from these sectors; their presence in S and T collaborative projects might distort the conditions under which such cooperation takes place and introduce a strong and unwelcome bias in its results.

2. NEW APPROACHES TO DEVELOPMENT AND INTERNATIONAL S AND T COOPERATION

2.1 International S and T cooperation for development must be based on a proper understanding of the character and objectives of the development process, as well as the serious limitations of international development strategies pursued in recent decades.

Strategies of development should now take into consideration the following concerns:

(a) Economic growth does not by itself lead to social development and increased general welfare which involves the satisfaction of basic human needs (adequate food, shelter, health, education and employment, in particular), especially of the lowest social and economic strata of the population.

(b) Meaningful development involves participation of the people themselves in the shaping of economic and social change. The contribution of women in such a process of change is of particular importance.

(c) As development is not a historically linear process, it should not consist simply of a replication in the LDCs of the structures and policies of the DCs. Many paths to development are possible, including capitalist, socialist and distinctively indigenous "third ways". It is important to ensure that the path chosen respects the cultural heritage and social values of the society concerned.

(d) Industrialization processes in the LDCs should not consist merely of a graft of certain industrial activities from the DCs, whether for exploitation of minerals or for producing wage goods locally or manufacturing for export. Industrialization has to be accompanied by the acquisition of the related technologies.

(e) Mere transfer of technology is not enough. Even if technology is freely available, a nation cannot develop unless it has an S and T infrastructure of manpower, knowledge, skills and innovative and productive capacities to absorb and adapt the imported technology. LDCs must therefore be self-reliant, both individually wherever possible and collectively, so that their slender S and T resources may be pooled to maximum effect.

(f) One cannot have two types of science, one for the LDCs and the other for the DCs. LDCs should not be satisfied with a derived culture in science which is continually dependent on DCs. For this reason, a national capability for basic research is as important for LDCs as for DCs, although the problems dealt with and the criteria of choice will often be different.

2.2 Following these principles, international S and T cooperation for development should:

(i) be based upon the assumption that not only the LDCs but the DCs as well share the responsibility - individually and collectively - for assuring conditions which will enable LDCs to follow a self-reliant strategy in S and T;

(ii) promote values and a career structure conducive to such cooperation and strengthen mutual trust and confidence between DC and LDC scientists and technologists; and

(iii) ensure that the security of the LDCs (political, military, economic and cultural) is not jeopardized by S and T collaborative endeavours.

2.3 The fact that the world community seeks ways to move from a period of confrontation between the DCs and LDCs to a stage of cooperation, with the objective of arriving at a New International Economic Order, increases the likelihood of new collaborative proposals and projects in S and T. In order that such initiatives may contribute in the most effective manner to the fulfilment of the aspirations and developmental objectives of the LDCs and avoid a repetition of the worst of previous misunderstandings, abuses and conflicts, Guidelines for International Scientific Collaboration for Development are needed. The present Guidelines are conceived as complementary to the International Code of Conduct for Transfer of Technology, an earlier Pugwash initiative (1974), under negotiation presently at the intergovernmental level within the framework of UNCTAD. The Guidelines are addressed to DC and LDC governments and funding agencies, international organizations and agencies, and scientists participating in these collaborative ventures.

3. GUIDELINES FOR LDC GOVERNMENTS AND SCIENTISTS AND FOR COOPERATION AMONG LDCs

The success of international S and T cooperation depends as much, if not more, on the LDCs themselves as on the DCs and international organizations. The more that the LDCs are able to identify their own S and T needs and priorities, to build up their S and T capability and hence expand their capacity to assimilate, adapt and improve imported scientific and technological knowledge, the greater will be their returns from international collaboration.

3.1 Guidelines for LDC Governments

(a) In order to achieve an indigenous S and T capability, the highest government policy makers in the LDCs should realize that:

(i) science and technology is decisive for the future of the whole society, and not just one of many sectors of public policy;

(ii) the buildup of such capability is a long-term process, to be nurtured patiently;

(iii) it requires the establishment of effective and durable links among the S and T community, the educational system, the productive system and the political system, which are often missing in LDCs;

(iv) careful construction of a broad-based and viable scientific and technological infrastructure is required, including managerial capability to organize and use it. This cannot be achieved only by training academic manpower and establishing research centres at random, or by uncoordinated use of technical assistance programmes;

(v) it involves the preparation of a long-term S and T plan as an integral component of the general socio-economic plan, as well as mechanisms for its

implementation; and that

(vi) it is unrealistic and counter-productive to base development strategies on massive foreign aid, whether financial, scientific or technological. Local resources, skills, and mechanisms must be committed to ensure an integrated and balanced development through an S and T plan linked with the socio-economic plan.

(b) The scientific community, higher education institutions and major S and T users in both the public and private sectors should be actively involved with government policy makers in constructing national socio-economic policies in general and the S and T plan in particular.

(c) This plan should define S and T tasks in each socio-economic sector, and general domestic priorities and options. It should also indicate appropriate areas for international collaboration and possible DC inputs consistent with the priorities of the overall plan.

(d) The plan should include S and T inputs to diversify the country's economy to avoid future dependences on a few primary products (agricultural or mineral).

(e) The S and T planning process should also confront conflicts between the proposed S and T policies and existing economic and social policies (e.g. fiscal, industrial, labour, agricultural, foreign investment, technology import) at the highest political level, before the decision is taken to strengthen an indigenous S and T capability as a major national objective.

(f) Proposals for S and T cooperation should be scrutinized to ensure that LDC dependence is not perpetuated. The object should always be to strengthen indigenous capabilities and self-reliance. Such proposals should not promote participation of foreign experts or advisers, but should rather give preference to national advisers and experts alone or in conjunction with temporarily needed foreign counterparts. Exceptions would, however, have to be made in respect of areas where although an LDC requires new knowledge it may not want to invest its scarce resources in building up local capability.

(g) In any collaborative undertaking, formulation of the project should be done jointly by the DC and LDC partners. Domestic S and T personnel should be charged with the decision-taking, managerial and evaluation functions in all collaborative undertakings carried out in the LDC. When this is not immediately possible, the collaborative project should have as an objective the building up of that capacity.

(h) Cooperative projects should not be conceived as replacements for indigenous endeavours. If such endeavours are inadequate in scope or quality, collaboration should be directed towards strengthening rather than eliminating them.

(i) LDC governments should also consider the implications for their policies and actions of the Guidelines suggested for DC governments and international agencies (section 4), and should establish suitable nodal groups to scrutinize collaborative projects.

(j) S and T policy formulation and implementation must be supported by an appropriate educational and training system (including the training of technicians), by high quality R and D institutions serving the needs of a developing society, and by an adequate information and documentation system. Where this cannot be done nationally, a

regional approach could be adopted.

(k) Non-governmental scientific bodies should be adequately supported to enable them to play an effective role in building an S and T community.

3.2 Guidelines for LDC Scientists and Technologists

To prepare themselves for the challenges of development and for fruitful participation in cooperative projects, scientists and technologists from LDCs should:

(i) organize themselves into an effective national scientific community, to determine their own standards of relevance and excellence, and to be known and respected for these standards;

(ii) engage in scientific research and communication, and also in efforts to ensure national support for science as a sustained public policy;

(iii) emphasize the intellectual challenge in applying existing knowledge to neglected areas of development, and recognize outstanding work of this nature when considering appointments, career advancement and awards;

(iv) accept direct service to society and the economy as an essential professional activity and as a social obligation;

(v) take responsibility, individually and collectively, to promote self-reliant development;

(vi) participate in public debate on development issues in general, and the role of S and T in particular, to build up credibility for S and T as an instrument for national development;

(vii) press national policy makers to prepare an S and T plan as an integral part of the plan for socio-economic development, and work toward mobilization of human, technical, natural and financial resources for a sustained attack on problems of development;

(viii) be alert to possible social, economic and political implications of advances in S and T, and assess these implications for their own societies; and

(ix) take an active interest in improving the human condition in their own and other countries, and in the dangers inherent in the global energy situation and the rapid depletion of the world's non-renewable resources.

3.3 Guidelines for Collaboration among LDCs

The LDCs cover a wide spectrum of development needs and S and T infrastructure and capabilities. With the necessary political will, LDCs can learn much from each other's experience in applying S and T to development. To enhance their S and T cooperation, LDCs should:

(i) promote mutual consultation and systematic exchange of information concerning their experience in science policy and planning, building S and T infrastructure, and the acquisition, development and application of S and T knowledge;

(ii) establish machinery for dissemination and exchange of S and T knowledge and experience originating in the LDCs so that the comparative advantages and special-

izations of various countries or sectors can be fully utilized;

(iii) arrange for the training and exchange of S and T personnel;

(iv) establish associations of research councils and joint R and D centres in areas of common interest, and machinery for exchange of recently developed S and T knowledge;

(v) promote S and T projects among LDCs with similarities in natural and social factor endowments; and

(vi) pool their S and T resources and capabilities for collective self-reliance in S and T for development.

Focal points specifically charged with facilitating such actions should be established within LDC governments and international agencies.

3.4 Cooperation Arrangements between LDCs and Transnational Corporations

3.4.1 The presence of transnational corporations (TNCs) in today's world is as real as the presence of national states. Not only is the economic, scientific and technological capacity of many TNCs much greater than that of most LDCs, but TNCs also control large sectors of modern technology and thus represent a major potential channel for technology transfer. LDCs must search for ways to meet the challenge of TNCs and to use these corporations as effectively as possible to increase the indigenous, scientific and technological capability of the LDCs. The traditional mechanism through which technical knowledge is transferred from a parent TNC in a DC to its subsidiary in an LDC does not necessarily increase the S and T capability of the LDC. It can even inhibit the LDC's S and T growth by attracting to the TNC subsidiary the best local scientific, technological and managerial talents and using them to further the global objectives of the TNC, which often conflict with the objectives of the nation states, particularly LDCs.

3.4.2 The existence of government mechanisms for regulating the activities of TNCs, particularly their technological activities in the host country, is essential to ensure that S and T collaboration between an LDC and a TNC contributes to national development objectives. Such arrangements should aim specifically at increasing: (a) the affiliates' contributions to indigenous scientific and technological skills; (b) the technological capacity of domestic firms to produce intermediate inputs for the affiliates' final products; and (c) technological knowledge of local distributors and users of the capital goods and major consumer durable products manufactured locally by TNC affiliates. These objectives are not achieved by the routine TNC training of LDC personnel. LDC governments should therefore consider requiring TNC affiliates to:

(i) contract a part of their own R and D needs with local R and D centres;

(ii) permit their personnel to engage in part-time R and D work in local higher-level educational and research institutions;

(iii) make available their own R and D facilities for training of scientists and technologists from outside the affiliates; and

(iv) organize technical training programmes for personnel of local sub-contracting firms and local distributors of their products.

Any such contribution of TNC affiliates to local R and D or training programmes in

the host country should, however, be consistent with the self-reliant S and T of the LDC concerned, and should not distort national S and T priorities embodied in the country's S and T plan. Many considerations regarding cooperation between LDCs and DCs (section 4) apply equally to cooperation between LDCs and TNCs.

4. GUIDELINES FOR DEVELOPED COUNTRY GOVERNMENTS, FUNDING AGENCIES AND SCIENTISTS

4.1 Collaboration between a DC and an LDC may generate new knowledge relevant to development, increase LDC scientific and technological capabilities, or lead to applying existing knowledge to development objectives. Guidelines for commercial technological transactions are excluded below as they are covered by the Code of Conduct for Transfer of Technology being negotiated in UNCTAD.

4.2 Guidelines to Governments and Funding Agencies

(a) Research funding agencies in DCs should devote more resources to the solution of problems relevant for LDCs, and to cooperative projects between LDCs and DCs.

(b) Priority should be given to those projects which contribute the most to strengthening LDC scientific and technological capabilities.

(c) The choice and mode of implementing collaborative projects should accord with the development priorities determined by the LDCs themselves and reflected in the commitment of their own resources. DC governments and agencies should therefore channel their funds for cooperative projects through the national authorities of LDCs, with exceptions kept in mind with respect to countries in which there is political suppression of scientists.

(d) Training programmes for LDC nationals should be provided in those areas and disciplines for which there is a clear need in the LDCs as determined by LDCs themselves.

(e) The leader of a project undertaken in an LDC should be a national of that country who should be responsible for its management and technical control. When this is not immediately possible, the first phase of the project should include the training of managerial and technical directors.

(f) The choice of any foreign consultat required by the LDC partner in the collaboration should be made by the country itself, and should not be imposed by the DC partner.

(g) Sponsoring agencies in DCs should accept that any S and T cooperative project in an LDC should be undertaken jointly with local institutions where they exist.

(h) Collaborative projects conducted in DC laboratories or institutions should involve scientists from the participating LDC, and the results of such projects should flow to and be applied in the LDC concerned on a preferential basis.

(i) When the results of collaborative research can be commercially exploited, the LDC partner should have priority in the patenting and use of these results.

(j) In cases where the raw data collected in the course of a collaborative project is considered by the LDC partner to be sensitive from the security or economic point of view, the decision to release such data or information should be at the discretion of the LDC partner. Publication of analyses and conclusions should be a joint undertaking.

(k) A collaborative project should be integrated in a long-term development programme as defined by the LDC. Collaborative programmes should not be used to exploit LDCs as testing grounds for new scientific concepts or technical innovations.

(l) Whenever a collaborative project involves research in drugs, chemosterilants, pesticides, etc., in an LDC, it should conform not only to the current regulations and ethical requirements in the LDC but also to the regulations of the DC as well as those accepted internationally (unless an explicit decision to the contrary is taken by the LDC partner).

(m) Identification and assessment of the ecological implications of collaborative programmes should be a part of the programme itself. Collaborative research conducted in an LDC should conform not only to the LDC's own environmental standards, but to international environmental standards as well.

(n) Collaborative programmes should allow for combinations other than the "expert-equipment-training" package, especially when the "expert" component is unnecessary.

(o) S and T cooperation should not be used to impose any particular political or economic system on an LDC.

4.3 Guidelines for Scientists and Technologists from Developed Countries.

Scientists and technologists from DCs who participate in collaborative projects in LDCs should:

(i) ensure that their work is for the benefit of the LDCs and not for other purposes conflicting with that goal;

(ii) do their utmost to contribute to strengthening LDC scientific and technological capabilities so that LDCs may conduct their own programmes as soon as possible without foreign inputs;

(iii) draw the attention of LDC agencies or governments to local expertise in the speciality of the DC scientists of which the agencies may not be aware;

(iv) refrain from using LDC scientists to collect data and conduct surveys primarily for the benefit of DC research, rather than for that of the LDCs; and

(v) be alert to the possible social, economic and political implications for LDCs of advances in S and T, and undertake detailed assessments of such implications in collaboration with LDC scientists.

5. GUIDELINES FOR INTERNATIONAL COOPERATION UNDER THE AUSPICES OF INTERNATIONAL AND REGIONAL ORGANIZATIONS

5.1 The role of international organizations in scientific cooperation for development is being debated. The UN system and other international organizations dealing with S and T cooperation for development urgently need to be restructured to meet the requirements of the New International Economic Order.

5.2 The success of all international scientific cooperation should be judged by the extent to which the indigenous scientific and technological capabilities of LDCs have been enhanced and expanded.

5.3 To achieve this end, the following Guidelines are suggested for S and T cooperation under the auspices of the UN and other international organizations, which complement the recommendations for DC scientists and governments in section 4.

5.4 International Agencies

(a) Cooperative projects undertaken with international agencies should be derived from the national plans and priorities of the LDCs, and should provide for flexibility in responding to changing conditions.

(b) Cooperation with the UN and other international organizations should ensure upgrading of LDC policy-making and managerial capabilities and the infrastructure necessary for the proper growth of S and T.

(c) Such projects should enhance internal S and T capabilities and self-reliance of LDCs, and should reduce their technological dependence on foreign entities.

(d) Inputs of UN organizations should be coordinated to increase their impact on LDC development programmes, vertically with other projects of the same organization, and horizontally with other UN organizations.

(e) International organizations should support the aim of local scientific personnel taking over responsibility as soon as possible for continued functioning of projects launched through international cooperation.

(f) Greater use should be made by international organizations of the expertise in LDCs, including consultancy organizations of all kinds.

(g) Choice of experts should take account of the dynamically changing needs of LDCs, and those countries themselves should be encouraged to make the choice of experts.

(h) Training is best accomplished within LDCs themselves. Where outside S and T training is needed, regional facilities and capabilities should be exploited first. In the case of training in DCs, adequate steps should be taken to ensure that the scientist returns to his own country, unless political persecution would be involved.

(i) S and T programmes of international organizations should not lend themselves to the commercial promotion of industrial products or processes.

(j) International organizations should not depend on TNCs for major funding of any of their activities. Any TNC contribution should be entirely without strings, and the nature and scope of the contribution should be made public.

(k) International organizations should not act as proxy for research projects at the instance of a third party, unless complete information about the interest of the third party is made freely available.

5.5 Regional and Inter-regional Organizations

Exchange of experience and cooperative projects between and among LDCs should be encouraged to build up collective self-reliance. Regional centres are valuable instruments for pooling resources, talents and facilities and for working out problems of mutual regional interest through a network of collaborating institutions from all participating countries. This is particularly pertinent where facilities would prove to be expensive and difficult to establish in a single country.

* * * *

The issues relating to development are essentially global ones, affecting the well-being of all humanity. The efforts of scientists, peoples and governments to develop cooperation in the fields of science and technology will contribute to the reinforcement of peace and security in the world. International cooperation in these fields would promote economic and social progress and the improvement of the conditions of life of people everywhere. Meaningful international cooperation in meeting the challenges of development necessitates a rational and collaborative approach, and appeals to the social responsibility of scientists; it calls for scientific humanism of a high order. The Guidelines presented here should, if applied, help to strengthen international scientific cooperation, and to surmount the problems of poverty and dependence of the LDCs; they would also help to build bridges between societies with different social, economic and political systems.

PROFILES OF PUGWASH OFFICERS AND COUNCIL

At the Munich Conference it was suggested that profiles of the members of Pugwash Council should be published in the Newsletter. Members of the Council were asked to answer a questionnaire seeking information on the following items:

1. Field of work
2. Date of birth
3. Education and academic degrees
4. Present position
5. Relevant past positions
6. Professional associations
7. Honours, awards
8. Main line of research
9. Publications.

The following include the answers to these points:

ACADEMICIAN ANGEL TONCHEV BALEVSKI

1. Engineering.
2. 15 April 1910.
3. Mech. Engineering, Brno 1934.
   Doctor of Science.
4. President, Bulgarian Academy of Sciences since 1968.
5. Professor and Rector, Higher Institute of Mechanical and Electrical Engineering.
   Director, Institute of Metals and Technology of Metal.
6. Member Bulgarian Academy of Sciences since 1952.
   Member State Council of the People's Republic of Bulgaria since 1971.
7. Order of Georgi Dimitrov: Lomonosov Medal of USSR Academy of Sciences.
   Hon. D. Eng. Ilmenau.
   Hon. Member of Academies of Science of Hungary, USSR, Poland, Czechoslovakia, GDR, Mongolia, Athens.
8. Structure and properties of metals. Pig iron production and casting under counter pressure.
9. Numerous papers in scientific journals and monographs.

PROFESSOR FRANCESCO CALOGERO

1. Theoretical and Mathematical Physics.
2. 6 February 1935.
3. "Leaurea in Fisica", University of Rome 1958.
4. Professor of Theoretical Physics, University of Rome.
5. Harkness Fellow, Berkeley and Princeton, U.S.A.
   Visiting Scientist, ITEF, Moscow, USSR.
6. American Physical Society.
   Societa Italiana di Fisica.
   Association of Mathematical Physics.
   Arms Control Association.
   Federation of American Scientists.
8. Scattering Theory, Nuclear Many-Body Problem, Exactly Solvable Dynamical Systems, Non-linear Evolution Equations.
9. About 130 scientific papers, author of 1 book and editor of 2 books; about 20 papers on "Science and Society".

PROFESSOR ABRAM CHAYES

1. Law.
2. 18 July 1922.
3. A.B. Harvard 1943.
   L.L.B. Harvard 1949.
4. Professor of Law, Harvard Law School since 1958.
5. Law clerk to Mr. Justice Frankfurter.
   The Legal Adviser, U.S. Department of State.
   Member Nuclear Energy Policy Study Group.
6. Fellow, American Academy of Arts and Sciences.
   Member: American Law Institute; American Society of International Law; Association of the Bar of the City of New York.
8. International Law, Arms Control.
9. Numerous scientific papers and 4 books.

PROFESSOR BERNARD T. FELD

1. Theoretical Physics.
2. 21 December 1919.
3. B.S. City College of New York 1939.
   Ph.D. Columbia 1945.
4. Professor of Physics, M.I.T.
   Head of Division of Nuclear and High Energy Physics.
5. Visiting Professor of Theoretical Physics at Imperial College of Science and Technology, London; also at Ecole Polytechnique, Paris and University of Rome; Visiting Senior Scientist, CERN, Geneva.
6. Vice-President American Academy of Arts and Sciences, 1972-1975.

Fellow American Association for the Advancement of Science.
President of the Council for a Livable World, 1964-73.
Editor-in-Chief Bulletin of Atomic Scientists.
Secretary-General of Pugwash 1973-1977.

7. Leo Szilard Award of the American Physical Society, 1975.
Public Service Award, Federation American Scientists, 1975.
8. Low and High Energy Nuclear Physics.
9. Many papers in professional journals and 2 books.

PROFESSOR SIR CHARLES FRANK

1. Physics.
2. 6 March 1911.
3. B.Sc. Oxford 1933.
D. Phil. Oxford 1937.
4. Professor Emeritus.
5. Professor of Physics at University of Bristol 1954-1976.
6. Fellow Royal Society (Vice-President 1967-69).
Fellow of the Institute of Physics.
7. Order of the British Empire 1946.
Knight Bachelor 1977.
Hon. D.Sc. Universities of Ghent, Bath and Surrey.
8. Physics of the Solid State.
9. Many publications in scientific journals.

MR. SHALHEVETH FREIER

1. Physics.
2. 16 July 1920.
3. M.Sc. Physics
4. Research Fellow, Dept. of Nuclear Physics, Weizmann Institute of Science.
5. Deputy Director-General Weizmann Institute of Science, 1967-1970.
Director-General Israel Atomic Energy Commission, 1971-1976.
6. Chairman, Presidential Committee for Science Policy.
8. Gravitational Waves, Mossbauer Effect, Science Policy, Industrial Research.

DR. ESSAM ELDIN GALAL

1. Medicine,
2. 23 September 1921.
3. M.B., B.Ch. Cairo, 1946.
Ph.D. Edinburgh, 1954.
4. Counsellor Ministry of Health.
5. Drug Research and Control Centre.
Head of Dept. of Pharmacology, Azhar University, Cairo.

Chairman Conjoint Research Board Ministry of Health.
Member of Board of Directors of Nutrition Research Institute.

6. President Egyptian Society of Pharmacology and Experimental Therapeutics.
Chairman National Committee of Pharmacology of the Egyptian Academy of Science and Technology.
Secretary-General Egyptian Society of Endocrinology, Metabolism and Diabetes.
UN Consultant on S & T Policy.
WHO Temporary Adviser on Drug Policy.
Member of Advisory Committee on Science and Technology of UN ACAST.
Member of Protein and Calories Advisory Group of UN (PAG).
8. Mechanisms of action of Hormones, Drug Evaluation, Science and Technology Policy.
9. 175 published papers in medical journals, monograms, textbooks and UN publications.

PROFESSOR HELLMUT GLUBRECHT

1. Biophysics.
2. 9 July 1917.
3. Hannover and Göttingen Diploma in Physics 1939.
D. Ing. Hannover 1943.
Docent of Biophysics 1951.
4. Director Institute of Biophysics, Technical University of Hannover since 1959.
Director Institute for Radiation Botany Munich.
Professor of Biophysics since 1959.
5. Deputy Director-General IAEA 1973-1977.
6. Chairman German Biophysical Society until 1973.
Hon. Chairman European Society of Nuclear Methods in Agriculture.
Chairman of Commission of Environmental and Radiation Biophysics of IUPAB.
Member of German Physics Society and others.
7. "Hermann Mahr-Preis" 1973.
Bundesverdienstkreuz 1977.
8. Environmental Biophysics & Radiobiology. Radioisotopes in biology, agriculture and horticulture.
9. About 80 publications in scientific journals and 1 book.

PROFESSOR LAMECK KAZEMBE HAZA GOMA

1. Zoology.
2. 4 August 1930.
3. B.Sc. Rhodes 1952.
B.A. Cambridge 1955.
M.A. Cambridge 1959.
Ph.D. London 1962.
4. Minister of Education, Republic of Zambia.
5. Professor of Zoology, University of Zambia in Lusaka.
Vice-Chancellor University of Zambia in Lusaka.

6. National Council for Scientific Research, Zambia.
   International Centre of Insect Physiology and Ecology, Nairobi, Kenya.
   Scientific Council of Africa, OAU.
7. D.Sc. (Honoris Causa), University of Ghana, Legon, Accra 1974.
8. Physiological Ecology of Insects (particularly mosquitoes).
9. Numerous research papers and 2 books.

PROFESSOR WILLIAM FRANK GUTTERIDGE

1. International Relations.
2. 21 September 1919.
3. M.A. Dip.Ed.
   Hertford College, Oxford 1946-9.
   Nuffield Foundation Home Civil Service.
4. Professor of International Studies, University of Aston in Birmingham.
5. Head of Department of Languages and Modern Studies, Lanchester Polytechnic, Coventry.
6. Member of Council for National Academic Awards (CNAA).
   Chairman CNAA Committee for Arts and Social Studies.
   Chairman CNAA Political Studies Board.
7. Member of the Order of the British Empire.
8. Arms Trade; the role of military in politics; Southern Africa.
9. 4 books and a number of articles.

PROFESSOR DOROTHY CROWFOOT HODGKIN

1. X-ray crystallography.
2. 12 May 1910.
3. Somerville College Oxford.
4. Chancellor of University of Bristol.
   President Pugwash Conferences on Science and World Affairs.
5. Wolfson Research Professor of the Royal Society Oxford 1960-1977.
   President International Union of Crystallography 1972-1975.
6. Fellow Royal Society since 1947.
   Foreign Member Royal Netherlands Academy of Science and Letters 1956.
   Foreign Member American Academy of Arts and Sciences 1958.
   Fellow Australian Academy of Sciences 1958.
   Foreign Member USSR Academy of Sciences 1976.
7. Nobel Prize for Chemistry 1964.
   Order of Merit 1965.
   Royal and Copley Medals of the Royal Society.
   Numerous Honorary Degrees of D.Sc.
8. Structure of molecules.
9. Numerous papers in scientific journals.

(Further profiles will be contained in the April Newsletter).

REPORT OF A ROUND TABLE DISCUSSION ON MEDICAL PROTECTION AGAINST ORGANOPHOSPHOROUS POISONS WITH SPECIAL REFERENCE TO NERVE GASES

Dubrovnik (Yugoslavia), 27 September 1978

Participants

Z. Binenfeld (Yugoslavia)
B. Boskovic (Yugoslavia)
V. Deljac (Yugoslavia)
A. Granov (Yugoslavia)
O. Hänninen (Finland)
E. Heilbronn (Sweden)
F. Hobbiger (UK)
H. Hoffmann (FRG)
P. Holland (UK)
K.H. Lohs (GDR)
M. Maksimovic (Yugoslavia)
M. Milosevic (Yugoslavia)
D. Minic (Yugoslavia)
M. Nenner (FRG)
H. Oldiges (FRG)
B. Pejuskovic (Yugoslavia)
E. Reiner (Yugoslavia)
N. Rosic (Yugoslavia)
L. Rosival (Czechoslovakia)
K. Schöne (FRG)
V. Simeon (Yugoslavia)
M. Skrinjaric-Spoljar (Yugoslavia)
B. Tokovic (Yugoslavia)
H. Vainio (Finland)
S. Vitorovic (Yugoslavia)
V. Vojvodic (Yugoslavia)
K. Wilhelm (Yugoslavia)
O.L. Wolthius (Netherlands)

In view of the relatively small number of scientific workers engaged in such work, and their relative isolation from each other, Pugwash in the past has encouraged informal meetings of such workers from different countries in order to encourage exchange of information and experience, e.g. the meetings in Herceg Novi in 1974, Helsinki 1975, and Mühlhausen 1976. Such meetings should be continued, and efforts should be stimulated to improve the dissemination of information relating to organophosphorous poisoning and therapy, and also with respect to protective equipment.

The participants of the round table discussion reviewed developments in the field of medical protection only insofar as they are related to mass casualty situations from the employment of highly toxic phosphorous-containing chemical weapons (CW) agents. Discussions centred on the present situation with respect to progress in preventive and therapeutic measures in poisoning by organophosphorous compounds (particularly "nerve gases").

According to published data in the last three years in the field of protection against organophosphorous poisoning, essential progress has been achieved only in the field of technical protection: introduction of new detectors, better protective clothing, and more improved respirators (masks).

New approaches in medical protection, such as immunization, enzymatic induction, synthesis of new type of antidotes, etc., have disappeared from scientific literature mainly because results have not justified expectations.

In the field of biopharmaceutical investigations very little has been done, especially concerning prolonged action of antidotes in the body. Of the therapeutic measures, only one exists in practice. This is the use of the cholinolytic drug atropine with or without a reactivator of the oxime type, of which three are used: pralidoxime, obidoxime and trimedoxime. Recent achievements include the introduction of a mixture of atropine, oxime (TMB-4) and benactyzine (by means of autoinjectors) as a basic measure for first aid therapy against organophosphorous poisoning under field conditions.

In the past two years there have been some interesting scientific developments, though not as yet applied practically, with respect to improved antidotes, There is now, for example, a definite possibility of developing new potent oximes of low toxicity that are capable of penetrating the bloodbrain barrier considerably better than the existing ones.

Although the results of present investigations in medical protection against nerve gas poisoning are insufficient, a steady experimental advance is evident even in protection against soman poisoning which was, until now, almost negligible. If this trend continues it can be expected that medicine and chemistry may produce effective protective means against nerve gas poisonings. This would greatly reduce the attractiveness of their use, and would promote endeavours to bring about an international ban on the use of CW.

Although there are differences in achievements, many similar problems are approached in different countries in the same way. If the problem of medical protection against nerve gas poisoning could be internationalized in the frame of a UN Agency, unnecessary double work could be avoided, and a better resolution of the problem would probably result. Meetings like this one are the only practical way to internationalize such investigations. It would be useful to continue such meetings and combine them with other organizations, e.g. SIPRI and WHO.

Scientists working on these problems should be able to communicate their results to each other, exchange substances, etc. For this communication to be optimally effective, an agreed set of standardized procedures for measuring, calculating and quoting results would be extremely useful. For the moment the Pugwash Movement represents the unique possibility to bring together scientists working on this very complex problem.

Z. Binenfeld

GHANA PUGWASH COMMITTEE

A Ghana Pugwash Committee was established in October 1978. The Interim Executive consists of Dr. R.K.A. Gardiner, Chairman, Professor F.G. Torto, Member, and Professor J. Yanney Ewusie, Secretary. The initial membership is twelve persons. Dr. Gardiner was for many years director of the UN Economic Commission for Africa (Addis Ababa) and subsequently the Minister of Economic Planning in Ghana; Professor Torto, Professor of Chemistry in the University of Ghana, served on the Pugwash Council from 1971-76; Professor Yanney Ewusie, a distinguished botanist and Vice-Chancellor of the University of Cape Coast, was responsible for the excellent organization of the Pan-African Symposium on Feeding Africa held in Cape Coast in June 1978 (see Newsletter, July 1978, p.14).

Letter on Vietnam (1967)

The following letter sent to me refers to a regrettable error printed in the brochure "The Pugwash Movement at Twenty One", sent with the October 1978 issue of the Newsletter. The letter refers to a mission on behalf of Pugwash to Hanoi in 1967, undertaken by Raymond Aubrac and Herbert Marcovich which, understandably, was kept extremely confidential at the time. In the April 1976 issue of the Newsletter (p. 203) Marcovich, a molecular biologist at the Pasteur Institute in Paris, described certain aspects of the mission, but a full account has still not been published. This was given verbally by Aubrac and Marcovich as one of the case studies in the recent Workshop on Political and Psychological Aspects of Crisis Management (see p. 62 of this issue). We are glad to publish this letter not only to set the record straight, but also because of its historical importance with respect to a Pugwash initiative that is not well known. Aubrac had access to President Ho Chi Minh because of a long standing friendship dating from 1946 when Ho Chi Minh stayed at Aubrac's home near Paris for several weeks and became the godfather of Aubrac's daughter. Aubrac, a distinguished participant in the French resistance movement during the second World War, earned the gratitude of the Vietnamese by arranging the release and care of Vietnam nationals who had been held in forced-labour camps in southern France during the war. Aubrac has served as special adviser to Kurt Waldheim on Vietnamese questions.

M. M. K.

23 November 1978

Dear Martin,

We have just received the recent pamphlet "The Pugwash Movement at Twenty One" issued by Pugwash, 1978. Thank you for sending it.

> We must however object to the wording of the paragraph related to Viet Nam (p. 7): "Not generally known is the fact that the start of the official negotiations between the USA and North Vietnam in the spring of 1968 was helped by a mission of French Pugwash scientists, sent from Paris in 1967, that conveyed to Hanoi the USA terms for terminating the war."

What we had to convey to Hanoi was "a formula to stop the escalation of the war". That was not "USA terms", but a Pugwash proposal, that is a proposal which had been agreed upon by Pugwash scientists from the USA, USSR, UK and France. Henry Kissinger was one of the two US members. At that time he was also a consultant to the US President, and he may well have previously ensured that the formula was acceptable to the highest US authorities. Still what we carried to the Vietnamese President and Prime Minister was a Pugwash proposal and could not be anything else.

That proposal was aimed not at terminating the war but at putting an end to the then very dangerous escalation.

It is a fact that the Vietnamese accepted to use the Pugwash channel, and that the exchange of messages which was organized as a result of this Pugwash initiative resulted in a better definition of the conditions which were needed to open negotiations, and this clarification turned out to become very useful some months later.

We hope that you will find ways to correct this unfortunate statement.

Yours sincerely,
Herbert Marcovich Raymond Aubrac

OBITUARY - VISHNU TRIVEDI (1916-1978)

Born in Gujerat on 12 February 1916, Vishnu Trivedi read English literature and language at the Gujerat College, Ahmedabad of Bombay University, and then went to Cambridge University, UK. Returning to India he became a lecturer at the Gujerat College and later Sydeham College of Commerce and Economics in Bombay.

Joining the Government of India in 1944-45, his association with the United Nations work dates back to the early sixties when he was the Joint Secretary in charge of the UN Division in the Ministry of External Affairs, dealing with nuclear policy with special emphasis on nuclear disarmament. He was chosen in 1964 to be India's first Ambassador to Switzerland, and later on was India's Ambassador to Austria where he served concurrently as the Indian representative on the Board of Governors of the IAEA (1967 to 1972).

Trivedi was one of India's leading policy makers and negotiators on nuclear issues ranging from weapons and disarmament to safeguards, power and safety. He was a keen Pugwashite. He attended the Udaipur Conference held in India in 1964, and more recently the Madras (1976) and Munich (1977) Conferences.

We regret to announce the death of Dr. Margaret Mead of the USA. An obituary will be published in the next Newsletter.

The communication below was received in Varna from Mrs. Trivedi.
It is addressed especially to Trivedi's friends and colleagues in Pugwash.

I have been approached by the President of the Municipality of Vishnu's home town and hundreds of his friends in India and around the world to organize a "Vishnu Trivedi Educational and Charitable Memorial Trust Fund". Many of the countries he served in are helping me with scholarships and contributions towards this project.

The aims and objects of this Trust Fund will be as follows:

(a) To give scholarships to young people who cannot afford higher studies.
(b) Subjects would be specially in Disarmament, Arms Control, the Non-Proliferation Treaty, and Science subjects.
(c) A school building at Kapadwanj Vishnu's hometown for senior students, with a laboratory and where science will be taught as a special subject.

Contributions can be sent to me by personal cheque in the name of "Vishnu Trivedi Memorial Trust Fund".

Thanking you for all your warm love and friendship over all these years to both of us. With kind regards,

Yours in sorrow,

Mrs. V.C. Trivedi
C-I/12 Lodi Gardens
Southend Road
New Delhi-110003, India.

CALENDAR OF FUTURE MEETINGS

(please note revised dates)

1979

21-23 March	Workshop on Disarmament and Development, Vienna.
24-25 March	Executive Committee meeting, Vienna.
19-21 April	Symposium on Impact of Current Political and Arms Control Developments on Security in Europe, Helsinki. (for agenda see p. 58, October 1978 issue of Newsletter).
13-17 June	7th Pugwash Workshop on Chemical Warfare, to be held jointly with SIPRI, Stockholm. (for agenda see p. 58, October 1978 issue of Newsletter).
18-23 July	29th Pugwash Conference, Mexico City (The Council will meet on 16, 17, and 24 July). (for agenda see p. 59, October 1978 issue of Newsletter).
1-7 December (tentative)	Symposium on the Nuclear Situation in the South Pacific, New Zealand.

1980

February	8th Pugwash Workshop on Chemical Warfare, G.D.R.
March (tentative)	Pan-African Symposium on Review and Actions Arising from the 1979 UN Conference on Science and Technology for Development, Khartoum.
Spring	Symposium on New Directions in Disarmament, Wingspread, Wisconsin.
20-25 August	30th Pugwash Conference, Netherlands.
September (tentative)	Symposium on New Weapons Systems and Criteria for Evaluating their Dangers, U.K.

PUGWASH CONFERENCES ON SCIENCE AND WORLD AFFAIRS

President : Professor Dorothy Hodgkin
Director-General : Dr. Martin M. Kaplan

PUGWASH COUNCIL

Chairman :	Professor M. Nalecz	(Poland)
Members :	Academician A.T. Balevski	(Bulgaria)
	Professor F. Calogero	(Italy)
	Professor A. Chayes	(USA)
	Professor B.T. Feld	(USA)
	Professor Sir Charles Frank	(UK)
	Mr. S. Freier	(Israel)
	Professor E.E. Galal	(Egypt)
	Professor H. Glubrecht	(FRG)
	Professor L.K.H. Goma	(Zambia)
	Professor W.F. Gutteridge	(UK)
	Professor G.B. Kistiakowsky	(USA)
	Professor E. Leibnitz	(GDR)
	Academician M.A. Markov	(USSR)
	Professor J.K. Miettinen	(Finland)
	Mr. A. Parthasarathi	(India)
	Academician O.A. Reutov	(USSR)
	Professor A. Rich	(USA)
	Professor M. Roche	(Venezuela)
	Professor J. Rotblat	(UK)
	Professor T. Toyoda	(Japan)
	Professor V.G. Trukhanovsky	(USSR)
	Dr. M.S. Wionczek	(Mexico)

PUGWASH EXECUTIVE COMMITTEE

Chairman : Professor B.T. Feld
Members : Professor F. Calogero
Professor A. Chayes
Professor E.E. Galal
Dr. M.M. Kaplan
Academician M.A. Markov
Professor M. Nalecz
Professor J. Rotblat
Dr. M.S. Wionczek

CENTRAL OFFICE

9 Great Russell Mansions
60 Great Russell Street
London WC1B 3BE
Telephone: (01) 405 6661
Telegraph: PUGWASH LONDON

EXECUTIVE OFFICE

11A Avenue de la Paix
1202 Geneva, Switzerland
Telephone: (022) 33 11 80
Telex: PEACE 28 167 CH
Telegraph: PUGWASH GENEVA

Printed by Taylor & Francis (Printers) Ltd., Rankine Road, Basingstoke