9 August 2000 - The 50th Pugwash Conference on Science and World Affairs met at Queens’ College, Cambridge, UK from 3-8 August 2000. It was attended by 147 scientists, scholars, and policy specialists from 47 countries, as well as 31 members of International Student/ Young Pugwash representing 18 countries who also met in a two-day pre-conference prior to the start of the 50th Conference. As usual, all members of the 50th Conference took part as individuals, not as representatives of any institution or government.

Being the Jubilee meeting, the Conference chose as its theme “Eliminating the Causes of War”, taking up the famous phrase in the Russell-Einstein Manifesto of 1955 - “Shall we put an end to the human race or shall mankind renounce war?” It reminds us that in the nuclear age -- with the potential threat to the very survival of the human species in a nuclear holocaust -- war must cease to exist. The task of the Conference was to examine the potential causes of war and seek means to eliminate them.

Six such causes were identified as subjects for study: human nature; political and economic issues; religion and ethnicity; poverty; environmental issues; and the misuse of science. These topics were discussed in six working groups that met separately; their findings were reported in a plenary session and are summarized below.

The overall theme of the Conference was also the subject of discussion at a public meeting on August 6, the 55th anniversary of the Hiroshima atomic bomb, which was introduced by a statement from Professor Shoji Sawada, a Hiroshima survivor. The main speakers were Sir John Keegan, Professor David Hamburg, and Professor Ana María Cetto. A plenary session was devoted to the nuclear issue, the chief topic on the Pugwash agenda. Under the title “The Impasse in Nuclear Disarmament,” Professor John Holdren, Professor Alexander Nikitin, and Mr Paul Schulte discussed the current situation and prospects for the elimination of nuclear arsenals. Two special lectures – given by Nobel Laureates – marked the end of the conference. The first Dorothy Hodgkin Memorial Lecture, set up to commemorate a past president of Pugwash, was given by Professor Amartya Sen, who spoke eloquently of the negative effects of nuclear developments for the security and welfare of the people of South Asia. And the centenary of the birth of Eugene Rabinowitch, a co-founder of Pugwash, was recalled by Sir Joseph Rotblat, in a review of “Fifty Pugwash Conferences.” During the Conference, there was an
especially moving ceremony of floating candles on the River Cam to honor the memory of the victims of the Hiroshima atomic bomb.

In the final session the President of Pugwash, Sir Michael Atiyah, gave the Presidential Address in which he noted the grim prospect that the US missile defence program could spark a renewal of the nuclear arms race and undermine the stability of international relations.

**Weapons of Mass Destruction and Global Security**

Despite some positive developments regarding the control and elimination of nuclear and other weapons of mass destruction since the 49th Pugwash Conference in Rustenburg, South Africa, major challenges continue to block the ultimate goal of eliminating such weapons entirely.

Most significantly, the five major nuclear weapons states for the first time ever made "an unequivocal undertaking to accomplish the total elimination of their nuclear arsenals" at the Sixth Review Conference of the NPT in April-May 2000. The NPT Conference in addition called for a "diminishing role for nuclear weapons in security policies to minimise the risk that these weapons ever be used and to facilitate the process of their total elimination." Also in April 2000, the Russian Duma voted to ratify the START II Treaty, signed in January 1993.

These positive steps were belied, however, by contradictory policies made by the very governments undertaking these commitments. The Clinton administration, for example, was supporting the development of ballistic missile defences that threaten to undermine the ABM Treaty of 1972 and the entire fabric of strategic arms control, while the United States Senate refused ratification of the Comprehensive Test Ban Treaty. The Russian Duma, meanwhile, attached conditions to its ratification of the START II Treaty that could jeopardise further reductions in offensive nuclear forces. Elsewhere, the threat of further nuclear proliferation remains, as does the possibility of nuclear terrorism.

In the realm of chemical and biological weapons, a critical juncture approaches as the Ad Hoc Group of States Parties to the Biological Weapons Convention (BWC) negotiates a protocol to strengthen the Convention, including measures for verification. Especially needed are procedures for random inspections of declared facilities, similar to those of the Chemical Weapons Convention, that are so far being resisted by certain states and pharmaceutical trade associations.

The Pugwash Council calls on all states, and most especially the nuclear weapons states, to adhere to international norms of behaviour as spelled out in the NPT, the CTBT, IAEA safeguards, the ABM and other nuclear weapons treaties, and the
chemical and biological weapons conventions. Pugwash also affirms the importance of the Advisory Opinion of the International Court of Justice (ICJ) in 1996 questioning the legality of either threatening to use, or using, nuclear weapons.

Bold steps are needed to reverse this deteriorating situation in the control and elimination of weapons of mass destruction. The nuclear powers should take further steps to de-alert their nuclear forces, to withdraw tactical nuclear weapons from outside their territory, and to ratify the CTBT and other outstanding commitments at the earliest possible moment. In addition to respecting existing nuclear weapons-free zones, the nuclear powers should work with the international community to enlarge such zones and negotiate "restraint regimes" for South Asia and other areas. Operational measures to give teeth to a “no-first-use” commitment are also needed.

Continued failure in the months and years ahead to implement these and other measures will only increase the risk of a catastrophic use of mass destruction weapons, whether by nation states or terrorist groups. To avert this danger to humanity, the Pugwash Council calls on individuals, NGOs and national governments to redouble their efforts to abolish all weapons of mass destruction and eliminate war as a legal, social institution.

Conference Theme: Eliminating the Causes of War

The Pugwash Council wishes to emphasise four main points that emerged from the conference working groups.

First, no single factor is responsible for the outbreak of war. Understanding the causes of war involves analysing a complex web of precipitating and underlying interdependent factors.

Second, as epitomised by the Pugwash tradition, international scientific collaboration is crucial in both understanding and minimising the dangers that face us.

Third, given the widespread social ramifications of developments in science and technology, scientists should elaborate an ethical code that will help prevent the misuse of science.

Fourth, war seldom concerns only those directly involved. In an increasingly interdependent world, conflict and the deprivation it causes is a matter of concern to the entire international community. Accordingly, Pugwash calls for the global
community to strengthen the rule of law, international institutions such as the United Nations, and the application of science to the benefit of humanity.

Conference Working Groups

The following short summaries of the six conference working groups highlight some of the important conclusions that Pugwash believes should be communicated to a wider audience.

1. **Institution of War and Human Nature**

   As organised warfare is characteristic only of the human species, it must depend on human nature. This does not, however, mean that war is an inevitable consequence of human nature. In questioning the supposed inevitable aggressiveness of humans, Working Group 1 analysed a variety of conflicts, from ethnic conflicts common in the 1990s to global warfare as seen in World War II. The group did so at three levels of analysis: from the standpoint of the individual, from dynamics of inter-group aggression, and from the institutional aspects of war.

   At all three levels, efforts must be made to create plural and inclusive identities and to break down the all too common dichotomies between "us" and "them." Education efforts that develop a culture of peace and help eliminate structural violence both within and between societies are sorely needed. Post-conflict development strategies that involve equally both parties to a conflict can promote economic reconstruction and confidence building. Strengthening democracy, an independent media, and international legal norms are all-important components to containing aggressive behaviour and promoting the peaceful resolution of disputes. The continued international trade in weaponry and the easy availability of arms is a further component of the institutional aspects of war that needs to be checked.

   In synthesising its recommendations, the working group stressed five points in particular:

   - the need to further develop and strengthen global norms that constrain state behaviour;
   - the adoption of carefully targeted and selected punitive measures for states which defy such norms;
   - the strengthening of the United Nations through the creation of a standing peace force;
   - the creation of an effective early warning system that is integrated within a broader response system;
o the further development of public international law and international criminal law, as embodied in the International Criminal Court.

2. **Institution of War: Political and Economic Aspects**

Warfare is a complex phenomenon, emanating from a variety of political, economic, and social causes. *Working Group 2* examined these issues from the perspective of a variety of conflicts, including internal conflicts and civil wars, classical inter-state conflict, and the concept of "just war" as it might be applied to national liberation and revolutionary wars as well as recent examples of international humanitarian intervention.

Methodologically, *Working Group 2* differentiated between objects of war (resources, power, influence), symptoms of war and causes of war. Distinctions were noted especially between underlying political, economic and social roots of war and the precipitating triggers and symptoms of war with a view to better understanding how early warning indicators of conflict can better prevent war.

On the issue of how the international community can more effectively mediate and intervene to prevent and stop conflict, difficult questions were raised as to how the "World Community" can best be represented in the United Nations and how the UN, as well as regional organisations, can become more effective forces for peace. The continued existence of artificially-drawn boundaries, the widespread availability of weapons, the pernicious manipulation of domestic public opinion, and the inability to provide the vast majority of the world's peoples with a stable and productive social fabric in which to live, work and prosper, were cited as endemic problems in need of resolution.

In terms of future Pugwash activities, *Working Group 2* recommended the convening of workshops that could explore the challenges posed by American unilateralism and the need for greater multilateral cooperation, fundamental differences in how security is perceived in the North and South, the feasibility of exporting the European model of regional governance, and current trends in arms production and trade.

3. **Religion and Ethnicity**

Three central arguments are crucial to understanding the role of religion and ethnicity in conflict: religion and ethnicity are socially constructed phenomena; both can be and often are manipulated to heighten divisions between communities; and the successful moderation of such differences in many societies means that religious and ethnic divisions are not an inevitable cause of conflict.
Reviewing a wide range of cases, from South Africa to the Balkans to central Africa, Working Group 3 identified a number of general conditions that often give rise to religious and ethnic conflict. These include: societies marked by significant political and economic inequality; cultural chauvinism and ghettoization; a political leadership which accentuates division; inadequate levels of social capital and networks that could connect peoples across sectarian fault-lines; and the poor socio-economic integration of the male population.

While no one set of corrective measures will be appropriate for all societies, the group was able to identify a number of steps that governments can take to greatly minimise the potential for inter-group friction:

- legal protections for the ethnic, religious and cultural rights of minority groups;
- development of electoral systems that foster new patterns of voting and representation in order to break down political allegiances that follow strict religious and ethnic patterns;
- minimising national economic and social policies that accentuate religious and ethnic divisions;
- avoiding external interference in the affairs of other states that worsen already deteriorating religious and ethnic relations;
- supporting international efforts to strengthen the rule of law through such institutions as the United Nations, International Criminal Court, International Court of Justice, and other bodies.

In looking ahead, Working Group 3 urged international Pugwash to support collaborative action and dialogue, such as is carried out by the World Conference on Religions and Peace in Bosnia and various Truth and Reconciliation forums in South Africa, the former Yugoslavia and elsewhere. National Pugwash Groups are called on to directly address religious and ethnic dimensions of conflict in their own societies and to facilitate meetings of scientists with cultural representatives.

**4. Poverty**

Responding to the question, "if there were no poverty, would there be no war", Working Group 4 concluded that impoverishment produces grievances and stresses that can make conflict more likely, but that additional political and social factors are necessary for sparking conflict. In particular, leaders and elites often manipulate the poorest sectors of societies, using them as little more than tools in precipitating and carrying out conflict.

The challenge, then, is recognising that literacy, an independent and responsible media, judicial protection of human rights, and other means of
strengthening civil society are essential pre-conditions for constraining political manipulation of the poor. Above all, a high priority needs to be accorded to education, particularly at the primary level in the rural areas of developing countries. *Working Group 4* recommended support for international initiatives to provide the requisite technology and teacher skills needed to greatly improve universal access to education, especially for young girls.

In terms of global economics, the group stressed the need for more truly co-operative agreements on trade and investment that reduce the crushing debt burden of developing countries and ameliorate the most discriminating effects of globalisation. The wealthier nations of the world must be ready to sacrifice those elements of their sovereignty that stand in the way of a more equitable sharing of global resources, possibly through the implementation of the so-called Tobin Tax on financial transfers or through taxes on the exploitation of under-priced global commons resources. More intensive efforts are also needed to make available adequate funds for development, environmental management, the diffusion of appropriate technology, and other measures that can empower the world's poorest people to defend their own interests and be less subject to manipulation by those who would lead them to war.

5. **Environmental Issues**

Competition over resources, environmental degradation, population growth, and mass migrations of people are among the inter-related factors that interact with poverty and marginalisation to cause conflicts between groups and nations. Environmental resources in particular may serve as military or political goals, as instruments of conflict, and as targets of conflict. Accordingly, equitable collaboration between nations and groups in matters of resource scarcity and environmental degradation is essential.

*Working Group 5* analysed specific cases, from local conflicts over natural resources to the global phenomenon of climate change, to pinpoint how resource and environmental issues can be both progenitors of conflict and stimulants to greater co-operation. The discussion ranged across a wide range of environmental goods and services, from freshwater resources to energy to food. Specific recommendations were made on the urgent need to increase efficient use of energy and reduce carbon and greenhouse gas emissions. National and international efforts to incorporate environmental variables into economic planning are sorely needed. Greater diffusion of appropriate technologies to developing countries, multilateral regulatory standards, economic stimulants that promote efficient use of resources, and improved conflict resolution mechanisms can all promote a more equitable use of the world's resources.
In anticipating future problems and opportunities, Working Group 5 stressed the importance of improved education and access to information concerning environmental scarcities, the inevitable erosion of national sovereignty if trans-national environmental challenges are to be managed co-operatively, and timely attention to emerging environmental dangers posed by new developments in biowarfare, nanotechnology, and other scientific advances.

6. Misuse of Science

The misuse of science was not thought generally to be a direct cause of war, yet science has certainly played a major role in shaping political decisions to go to war, and on the conduct and destructiveness of conflict itself. On the other hand, scientists have made important contributions to the avoidance of war, both through the development of technologies (e.g., for monitoring and verifying arms control agreements) and through the establishment of international communities, like Pugwash, that foster non-partisan co-operation and understanding.

Most worrisome are the weapons of mass destruction (nuclear, chemical, biological) arising from scientific advances that now have the potential for ending human life as we know it. Despite global conventions banning chemical and biological weapons, and modest reductions in nuclear stockpiles, the world still faces threats of unparalleled magnitude. The scientific community more than any other has a responsibility for working to mitigate such dangers and to bring these threats to the attention of the world community.

Working Group 6 also highlighted emerging concerns regarding the global growth of the internet and information technologies, such as the vulnerability of computer networks, inequality of access exacerbated by proprietary information, and threats to privacy. In the field of robotics and nanotechnology, greatly increased computational power and the miniaturisation of components holds out the promise of far more efficient use of resources in manufacturing and energy generation as well as the application of minute sensors for weapons treaty verification.

The field of biotechnology illustrates more than any other the promise and pitfalls of the use and misuse of science. The ability to manipulate all life processes - from cognition and development to reproduction and heredity - can be used to greatly enhance the quality of life all over the world, or to introduce pathogens and biological agents with disastrous long-term consequences.

A growing concern also is that of space activities, and particularly the threat of an increased militarization of space in connection with the development
of national missile defences. Working Group 6 stressed the dangers of countries seeking to dominate space for military activities, which could provoke other states to develop counter-measures (e.g., anti-satellite weapons) that might well lead to actual conflict.

In anticipating such an uncertain future, the social responsibility of scientists becomes more important than ever. The pledge adopted by the international Student/Young Pugwash groups is an important means of bringing such issues to public attention. In this field above all, Pugwash occupies a unique role for developing instruments that can provide early warning of dangerous applications of scientific developments and for establishing norms of ethical conduct that enhance the contributions of the scientific community to a more peaceful and equitable world.

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