

Pugwash

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Missile Defense: At Sea?

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Editors:
 Jeffrey Boutwell and
 George Rathjens

Production Assistant:
 Tracy Sanderson

Design and Layout:
 Anne Read

On the cover:

Aegis Theater Missile Defense

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To the Pugwash Community

As we went to press, the election of a new US President was still undecided. More than a week after 100 million Americans went to the polls, the ultimate margin of victory for either George W. Bush or Al Gore appeared to hinge on several hundred Florida votes. Whoever does take office on January 20, the next American President (and Commander in Chief), the man with ultimate authority over the world's largest nuclear arsenal, will begin his term in office in the most politically tenuous position of any American president in perhaps a century.

What does this all mean for the future of reducing and ultimately eliminating nuclear weapons? The prospects are not good. In addition to having a President who won on the strength (or weakness) of a few hundred votes, the US Congress is likewise evenly divided between Republicans and Democrats, with Republicans holding at best a 51-49 majority in the Senate and about a 10-seat edge in the 435-member House of Representatives. With political power split down the middle, and with rancor and partisanship already characterizing Washington politics, the US government is unlikely to take bold new steps to reverse the deterioration in arms control that was allowed to accelerate during the final few years of the Clinton presidency.

One silver lining in this looming cloud is that neither a Bush nor a Gore administration will have much of a mandate for proceeding full speed ahead with plans for national missile defense. Given public opinion polls showing a majority of Americans opposed to NMD, and with continued opposition to NMD certain to come from Russia, China and even most of America's allies (see the Pugwash workshop report on page 41), the next president will face substantial political obstacles in committing the US to missile defense deployment.

What then to do? Because drift and uncertainty are likely to characterize the next few years, it becomes all the more important for publics and NGOs such as Pugwash to continue to press the case for the abolition of nuclear weapons, and for finding concrete and feasible ways to reach that goal. In addition to its work on missile defenses and nuclear stability, which will continue with a workshop in South Korea in April 2001, Pugwash is also initiating a new study group on the abolition of nuclear weapons, which will meet for the first time in India in March 2001. This concerted effort to examine the fundamental re-orientation of security policies and the progress needed to implement truly cooperative security arrangements will continue for several years, years that could well be marked by increased instability and tension among the world's nuclear powers.

The 50th Pugwash Conference and Beyond

The Jubilee conference held at Queens' College, University of Cambridge, in August 2000 provided a fitting tribute to the convening of 50 Pugwash conferences since 1957. Great appreciation is due the British Pugwash organizing committee for all its efforts in hosting the meeting. Of special note are Jo Rotblat's appreciation of Eugene Rabinowitch (page 50) and the occasion of the first Dorothy Hodgkin Memorial Lecture, in which Amartya Sen convincingly argued that India's testing of nuclear weapons in May 1998 was manifestly counterproductive both politically and militarily (page 57).

During its sessions before and after the 50th Conference, the Pugwash Council discussed various options for improving the format of future annual conferences, the publications program, and especially the effectiveness of Pugwash outreach and dissemination efforts. The Council also welcomed two new members, Luis Masperi and Chen Jifeng, while expressing thanks for their service to two departing members, Julio Carasales and Zhuang Fenggan.

Planning for future Pugwash conferences is well underway, with the 51st Pugwash Conference taking place in Agra, India from 10-16 November 2001 and the Quinquennial 52nd Conference scheduled for 9-14 August 2002 at the University of California, San Diego, in La Jolla, California.

Pugwash Publications

Future issues of the new *Pugwash Occasional Paper* series will include essays from the Como workshop of the Pugwash Study Group on Intervention, Sovereignty and International Security (January 2001); a collection of European perspectives on missile defenses and nuclear stability from the Sigtuna workshop (February 2001); and a Pugwash Policy Brief on new medical treatments and vaccines being developed in Cuba and the implications of the US embargo for preventing the availability of such treatments in the United States (spring 2001). Discerning readers of the Pugwash Newsletter will notice a re-ordering of Pugwash meetings from previous issues. The nuclear consultation meetings in La Jolla and London in early 2000 were indeed consultations, not formal Pugwash workshops, thus subsequent Pugwash workshops and symposia have been re-numbered accordingly.

Appreciation

For their continued support of the Pugwash publications program, we gratefully acknowledge the support of the Cyrus Eaton Foundation, the Italian National Research Council, the German Research Society, the Rockefeller Foundation, and the John D. and Catherine T. MacArthur Foundation.

50th Pugwash Conference *Eliminating the Causes of War*

3–8 August 2000, Cambridge, UK

Communiqué of the Pugwash Council

Tackling one of the most fundamental challenges of the 21st century, “Eliminating the Causes of War,” the 50th Pugwash Conference on Science and World Affairs met at Queens’ College, Cambridge, UK from 3-8 August 2000.

Drawing their inspiration from the Russell-Einstein Manifesto of 1955 – “Shall we put an end to the human race or shall mankind renounce war,” more than 150 participants from 47 countries focused on the proposition that war must cease to exist, especially when the very survival of the human species is called into question by nuclear weapons.

Recent developments, however, including the highly controversial US missile defence program, raise the grim prospect of a renewal of the nuclear arms race. In his closing address, Sir Michael Atiyah, President of Pugwash, noted the threat that missile defences pose to the stability of international relations and the entire structure of nuclear weapons arms control.

Other dangerous developments on the world scene include the failure of the US Senate to ratify the CTBT, certain changes in Russian nuclear

doctrine, further nuclear proliferation, and the latent danger of terrorist use of weapons of mass destruction, including biological and chemical.

Recognising these critical threats to human security, the Pugwash Council calls on all governments to adhere to international agreements to which they are a party, such as the ABM Treaty, the Comprehensive Test Ban, and the Non-Proliferation Treaty, and to the chemical and biological weapons conventions.

.....
***Shall we put an end to the
human race or shall mankind
renounce war?***

But bolder steps are needed. Pugwash calls upon the nuclear powers to implement their “unequivocal undertaking to accomplish the total elimination of their nuclear arsenals” made at the Sixth Review Conference of the Non-Proliferation Treaty in April 2000. As immediate steps toward that goal, Pugwash urges nuclear powers to accelerate the denuclearisation of their nuclear forces, to withdraw tactical nuclear weapons from outside national territory, and to ratify the CTBT and other unfulfilled commitments at the earliest

possible date. More intensive efforts are also needed to strengthen the Biological Weapons Convention with a verification protocol and to broaden implementation of the Chemical Weapons Convention.

Pugwash recognises that weapons of mass destruction are only one manifestation of human conflict, and that internal wars fought with widely available small arms and light weapons are killing and maiming millions of people. In six conference working groups, participants analysed the multiple and inter-related causes of conflict: human nature; political and economic issues; religion and ethnicity; poverty; environmental issues; and the misuse of science. The international community must make a concerted and sustained effort to address all these roots of conflict, through the alleviation of poverty, improved mechanisms for conflict resolution and prevention, and greater tolerance of the differences embodied in our global family.

To end the scourge of war, the Pugwash scientific community stresses the need to broaden democratic norms of governance, to strengthen international institutions and the rule of law, to reduce global inequities that often spark conflict, and above all to work for the application of science for the benefit of humanity.

Statement of the Pugwash Council

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 under-

taking 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

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Understanding the causes of war involves analysing a complex web of precipitating and underlying interdependent factors.

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;
- 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 condi-

tions 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.

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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.
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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. Envi-

ronmental 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 bio-

warfare, 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 minia-

Program Agenda

Pugwash Conference: *Eliminating the Causes of War*

3-8 August 2000, Cambridge, England

1. THE INSTITUTION OF WAR AND HUMAN NATURE

Humans are capable of aggression, and are also capable of pro-social and altruistic behaviour. Both are subject to experiential influences in the course of socialization. What influences can suppress aggressiveness (and especially territoriality) and augment pro-social behaviour? Does aggressiveness contribute to war? What are the forces that maintain war as an acceptable means of solving conflicts?

2. THE INSTITUTION OF WAR: POLITICAL AND ECONOMIC ASPECTS

Past security policies, abetted by the military-industrial-scientific complex, encouraged a culture of violence. Developed countries produce, stockpile and export huge quantities of weapons. Poor countries spend resources on arms instead of improving the standard of living of their people. Can a way be found to escape this impasse? The European Union could provide a model of harmonious co-existence in spite of ethnic, religious and cultural diversity. But could the EU countries cut back their military-industrial complexes, and reduce their military spending, without causing economic problems or diminishing their security? Is there still a need for conscription or for large standing national armed forces within the European Union?

3. RELIGION AND ETHNICITY

These are potent causes of war. The discussion will include documented cases where religious and ethnic prejudices have contributed to conflict, and discuss the extent to which they were primary causes or adjuncts to political or economic issues. Discussion may also focus on ways to minimize the role of such prejudices, and on resolution of conflicts at an early stage.

4. POVERTY

For a number of reasons, including the increasing globalization of the economy, the gap between rich and poor, both within and between countries, is increasing. Poverty, and especially this income gap, is a strong correlate of violence. The discussion may concentrate on the psychological and social processes by which poverty leads to violence, which may well differ between developed and under-developed countries. The main focus should be on how these processes can be inactivated.

5. ENVIRONMENTAL ISSUES

Competition for natural resources, especially oil and water, coupled with the increasing world population, is an increasing cause of strife and may lead to military confrontation. The working group assessed the magnitude of the problem, and discussed both technological and political solutions, involving both local and global issues.

6. MISUSE OF SCIENCE

Science is a dominant factor in modern society and its misapplication may endanger the human species. Conventional wars escalating into a full-scale nuclear exchange are a continuing threat. Other weapons may be developed to provide cheaper and more readily available means of mass destruction. What measures can be taken to minimize the misuse of scientific research?

turisation 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.

The 50th Pugwash Conference on Science and World Affairs was held in Queens' College, University of Cambridge. Chaired by Sebastian Pease, the Conference was organised by the British Pugwash Organising Committee, co-chaired by Robert Hinde and Sir Joseph Rotblat with the invaluable assistance of Tom Milne. Providing additional support were Claudia Vaughn and Mimma de Santis of the international Pugwash office in Rome, and Tracy Sanderson of the Pugwash secretariat in Cambridge, Mass.

Pugwash is grateful to all of the organisations and individuals which provided support for the 50th Pugwash Conference, including the following major contributors: the British Pugwash Trust, the Colleges and University of Cambridge, the Ésmee Fairbairn Charitable Trust, the Joseph Rowntree Charitable Trust, Sir Oliver Scott, and UNESCO.

The Pugwash Council, whose pre-Conference meetings were held in King's College, was entertained by the Provost of that College. The University of Cambridge and Trinity College kindly provided receptions for Conference participants. A splendid concert was given in the Chapel of St. John's College by the Gemini Ensemble under the auspices of Musicians Against Nuclear Arms. We are grateful also to Richenda Huxley, Wendy Hinde, and their colleagues for organising the social events, which included visits to Cavendish Laboratory and Ely Cathedral.

Presidential Address: 8 August 2000

Sir Michael Atiyah

In his address to the Pugwash conference the President has basically two choices of what to talk about. He can talk in general philosophical terms about the aims of Pugwash and its role in the world, with the aim of providing enthusiasm for the grass roots. But to do this after Jo Rotblat would be an anticlimax: no one can hope to emulate Jo at this sort of thing, nor to rival his knowledge and experience of Pugwash. The other choice is to focus on some specific topical problem, close to Pugwash's central interests. The danger here is that this topic is very likely to have been discussed at some length in one of the working groups. Either the President repeats what has already been said or, worse, he disagrees. However I will take the risk. I believe that Pugwash should concentrate on what it does best and in areas where it might actually be effective. Saying the same thing twice or even three times, perhaps with some different nuances, will do no harm and might even give events a push.

Pugwash's central interest has always been with nuclear weapons and the dangers they present. You are all familiar with the general situation at the present time. After the many years of massive nuclear build ups and with world having narrowly escaped disaster sanity began to dawn. Large numbers of treaties were signed, agreements were reached and a rapid decline in nuclear arsenals started. The changing world scene,

following the collapse of Communism in the Soviet Union, made one even more hopeful and plans to get rid of nuclear weapons altogether began to sound less utopian. Progress along this avenue might be painfully slow, and there could be hiccups, such as the India/Pakistani nuclear tests, but it was possible to remain optimistic. Now that the world was converging economically and perhaps politically the insanity of nuclear weapons would become more obvious and, with the encouragement of Pugwash and others, we could perhaps see light at the end of the notorious tunnel.

Now however one major threat to this peaceful scenario has appeared on the near horizon, which has the potential to take us on a backward path, with untold consequences. I refer to the American plans for National Missile Defence sometimes referred to jocularly as "son of star wars," though this is no laughing matter. As many of you will know there is a strong American push to develop a small-scale defence system which could intercept offensive missiles from so-called "rogue states." The argument is that, while the major powers no longer threaten each other, there is an emerging threat from smaller countries and that it is possible technically to develop an effective system that would defend the United States against such potential threats. Several tests have already been carried out and a firm decision by President Clinton is expected shortly. He must decide whether to go ahead with full scale development of the system—though a decision on its eventual deployment would not be made till much later. This is the situation as I write, but the

decision might have been taken by the time I come to address you—so it is certainly topical.

At a superficial level one can understand the attractiveness of the plan. After all who can object to a defence system aimed at protecting innocent civilians from the bandits of this world? In terms of domestic politics it is hard to oppose. As so often before, what is technically possible becomes politically necessary. It is to be regretted that part at least of the scientific community is behind this project. We have been here before.

The trouble lies in the potential clash with the ABM treaty, viewed by many as the cornerstone of world security at the present time. There are those who argue that any system along the lines of the American plans conflicts with the ABM Treaty and poses a threat to the other major powers. The American military have a difficult argument to make. First they have to convince the President and Congress that the system will work (and so get funded). On the other hand they have to persuade the Russians and the Chinese that it does not work too well, otherwise it threatens their nuclear capability. Technically they may be right, but subtle arguments of this kind do not go down well in the political world, where psychology and intention are much more important.

Inside America the argument seems to have been won by the hawks. All the evidence is that the President has little room for manoeuvre, particularly since his term is coming to an end. In the rest of the world the reaction has been hostile. President Putin, flexing his muscles,

has moved quickly to get approval of START II, but has indicated his opposition to the American plans and has indicated his strong support for upholding the ABM Treaty. The Chinese have dropped hints that, if the Americans go ahead, they may feel compelled to upgrade their nuclear arsenal in self-defence. This in turn would worry the Japanese.

In Europe most countries, with the exception of the UK, seem to be opposed to the American plans. The Germans in particular have expressed their concern.

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Hiding behind a Fortress America mentality is totally out of keeping with the new kind of world we are entering in this century.
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The dangers are clear. The relative stability of recent years may be on the verge of disappearing. We may be about to see a new phase of the arms race. Trust will vanish and be replaced by suspicion. The whole international climate may become soured.

To an outsider the world may resemble a short-sighted elephant lumbering slowly towards a cliff. Unable to see what is in front of him, but proceeding inexorably to disaster.

And all for what? To defend America against “rogue states.” Is this really a serious threat and if so are ballistic missile defences the right way to deal with it? Let me now spend a little time examining this in detail.

The list of potential “rogue states” varies with time and even the terminology changes – they are now “states of concern,” but the list has probably included: North Korea, Libya, Iraq, Syria. What do these countries have in common? First they are all a long way from the United States, secondly they are all run by dictatorial regimes, thirdly they are fairly small and their people are poor.

It is very hard to make a convincing case that any of these pose a serious threat to the United States. It would certainly take many years before they could begin to mount a threat. Meanwhile their neighbours are likely to get much more worried than the US, electronic surveillance would expose their plans, and the US could use political, economic or military pressure to handle it. You do not need to be a suspicious Chinese to see the weakness in the American argument, and I doubt if many informed Americans really believe in it either.

But let us turn the problem round. Are there better ways of handling these countries? Is it possible to integrate them into the world community so that they cease to have the appearance of outcasts? Can we not use the carrot instead of the stick?

Already the situation is changing on the ground. North and South Korea have started a constructive dialogue and the omens are promising. Syria, under Assad, started to have peace talks with Israel, and these might resume under the new regime. Libya, ostracized for so long because of the Lockerbie bombing, is coming back into the fold. Only Iraq remains a real difficulty and here it has to be admitted that the US



Defense missile interceptor

(backed by the UK) appears to have no real policy beyond an irregular and uncertain bombing strategy, something which merely perpetuates the present regime.

A political approach, involving dialogue and economic aid, seems much the more sensible policy. The poor inhabitants of these countries would benefit and in due course this might lead to some democratic progress. This would provide much more genuine security for all concerned at a fraction of the financial cost of a ballistic missile defence system. Morality, politics and economics all point in the same direction.

The United States is leading the way in the economic and financial integration of the world. It should be following this up by solving problems politically, using its enormous resources constructively. Hiding behind a Fortress America mentality is totally out of keeping with the new

kind of world we are entering in this century.

It is ironic that democratic government, which we all applaud, and which is slowly winning out in the world, is also the source of our major problems. As I mentioned earlier it is American domestic politics which is driving the NMD. National Defence is always a vote-winner and no political party can afford to appear soft on the issue. For this reason it is usually the hawkish parties that can afford to make deals, since their patriotism is less in question. Unfortunately they only do so occasionally and there is no reason to expect a new President Bush to cancel the NMD.

In the UK we see a similar process. The Labour Party lost many elections, according to one theory, because they were opposed to nuclear weapons. This may not be true but Foreign Policy can lose votes and the Government is afraid of taking strong steps.

It makes much of the special relationship with the US and so has not joined in the criticism of American policy from other European countries.

But, besides the old democracies, we now have new ones, notably Russia. It is already clear that President Putin has to pay attention to nationalist public opinion and that his room for compromise with America is limited. He cannot be pushed too far. In this sense it was easier to deal with the old regime when the rulers could make their own decisions based on their assessment of the political and military situation. Public opinion could effectively be ignored. I should be clear that I am not arguing in favour of dictatorship, but only pointing out the extra difficulties that democracies sometimes present.

The situation in China is of course different, but looking ahead into the future we may have to deal with a more democratic regime and this may be tougher to negotiate with than Russia, since it is more likely to be a significant economic force. We must hope that, by the time all this comes about, the major security questions will have been resolved.

I have deliberately painted a bleak picture. Is this crisis inevitable and is it as bad as I have suggested? Can we do anything about it?

Although the situation in the US seems set, there are two rays of hope. In the first place the administration is aware of the international hostility to its plans and is sensitive on the matter—hence their attempts to get Russia to accept a watered-down interpretation of the ABM Treaty. If the concerns of Russia and China

were also supported strongly by America's allies it is just possible there might be a change of policy. The role of the UK is fairly crucial here. In part this is because of the radar establishment at Fylingdales which is a part of the projected system. But more important is the fact that the UK has been the strongest supporter of US foreign policy in recent years (e.g in Iraq) and opposition by the UK, adding its weight to the concerns expressed by other European countries, might just cause the US to think again. Clearly such a step by Tony Blair's government would take some courage. It would put a strain on the "special relationship," but in the last resort a real friend must be prepared to criticize. Such criticism, though painful, is more likely to be heeded. I hope this will start a serious debate in the country and lead the Government to reconsider its views.

The second ray of hope, not unconnected to the first, is that the introduction of a major new weapons system is a very long process, taking perhaps up to a decade for full implementation. This gives a lot of latitude for discussion, delay and compromise. My analogy with the trundling elephant was not quite accurate. Rather than going for a cliff he is perhaps just sliding down a long slippery slope. The end may be the same but there is more hope of turning back.

So I hope President Clinton, with or without Tony Blair's advice, decides not to go ahead with the NMD at this stage. But if he does, all is not yet lost and the pressure for modification and compromise has to be maintained.

Let me now turn to another matter, also involving nuclear issues, but of more immediate concern to Pugwash. As you know one of the strengths of Pugwash has been that, even in the most difficult times, it has acted as a forum where serious discussions could take place on controversial issues. During the long period of the Cold War, Russian and American scientists were able to meet and deal with very sensitive issues of nuclear weapons. Our ability to arrange such meetings has been an essential part of our mission and the Nobel Peace Prize recognized this fact.

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One would think, that in the much improved international climate of the present time, things would be easier and that there would be no difficulty in getting visas for the participants at our meetings. In the past such difficulties were not unknown. Getting into Eastern Europe was not easy and, during the McCarthy period, the US posed similar barriers. I remind you of all this just to emphasize how surprised we were to find that the British Government has refused a visa to a distinguished Pakistani scientist who wanted to attend this meeting in Cambridge.

He has attended many Pugwash meetings in the past and we would very much have welcomed his presence here. The security situation in Asia continues to cause concern and the views of well-informed Pakistani colleagues would have been valuable.

All of us in the British Pugwash group are embarrassed and perplexed by the action of our own Government. Since there are general issues involved let me explain the situation at greater length.

This audience does not need reminding that two years ago India and Pakistan both conducted nuclear tests and effectively joined the list of acknowledged nuclear powers. This caused shock and consternation round the world and the Pugwash Council, after much deliberation, issued a statement which deplored the India/Pakistan action but which also criticized the main nuclear powers for dragging their feet on steps to reduce nuclear armaments. This failure of the nuclear weapons states to fulfil their obligations under the Non-Proliferation Treaty was certainly a significant contributory factor in the Indian and Pakistani decisions.

The reaction of the 5 nuclear powers continues to be myopic and legalistic. They formed a club, drew up the rules and then objected when some outsiders refused to join on these terms. Instead of recognizing the realities of the new situation and trying to accommodate the views of India and Pakistan they play the role of the aggrieved party. India and Pakistan did not play by our rules, so they have to suffer. In particular the UK Government refuses to allow any

Pakistani nuclear scientist to enter the UK. The grounds for this policy are legalistic and specious. It is claimed that, as a country that has signed up to the NPT, the UK has undertaken not to assist any non-nuclear weapon-state to acquire nuclear weapons. The weakness of this argument is transparent. India and Pakistan already have nuclear weapons, so they do not need UK assistance. Moreover the embargo on nuclear scientists includes attendance at Pugwash conferences, hardly the place where state secrets are on sale. All this is reminiscent of the bad old days of the Soviet Union and McCarthy America. Good legal reasons were always given, but if the basic assumptions are shaky no amount of sound reasoning is convincing.

So, on behalf of the UK Pugwash group, I have to apologize most abjectly for the fact that an important participant was not able to attend this meeting. Next year the Pugwash conference will be in India and I very much hope that the Indian Government will behave in a more civilized and enlightened way.

Since I am the last speaker at this Pugwash Conference let me make a few general comments about what we have achieved and where we go from here.

Every annual conference besides bringing together the old Pugwash hands and enabling them to discuss the familiar issues also acts as an opportunity to attract new members from different backgrounds. As the world changes and presents new challenges so we need to broaden our expertise if we are to respond appropriately. New people and new ideas are needed and one great source of both is of course Student/Young Pugwash. It is always refreshing for those of us, of the older generation, to have the company of the students. Their enthusiasm, commitment and contribution is a significant factor in the success of the conference.

Tomorrow morning, when most of you are on your way home, or enjoying a holiday in this country, the Pugwash Council will meet to consider the outcome of this conference. Ideas and proposals which have emerged during your discussions will provide an input to the Council debate and will help us decide on the best ways of pursuing the Pugwash agenda. In general, we know what we would like to achieve. The real question is: how can we make a real difference? There are long lists of desirable objectives and many methods by which we can try to reach them. Our task is to select those which are most likely to be effective.

As you know Pugwash is an unusual organization. It is not a structured organization with well-defined membership. Anyone who

has attended a Pugwash meeting can consider themselves a “Pugwashite.” We come from many countries and many backgrounds. There is no criterion to identify a “Pugwashite.” In principle we are open to all who are prepared to engage in rational argument. I like to refer to Pugwash as a community rather than as a movement or organization. The term captures the spirit better than other descriptions.

In conclusion let me make some general comments about the future. The world of the 21st century is a more inter-connected world and it is also one of fast political, economic and military change. This makes for uncertainty all round. Democracy may be slowly winning out but, as I have indicated earlier, this does not necessarily make things easier. Science is coming to be ever more dominant and this means that the responsibility of scientists will increase. They will have to use their collective voice internationally to argue for sanity. There are many channels through which this can be done—the more complex world we live in means that authority and power are more diffused. But Pugwash with its distinctive history is certainly an important player and I hope and trust that it can find its proper role in the exciting times ahead.

Working Papers

WORKING GROUP 1

Robert A. Hinde (UK) and Lea Pulkkinen (Finland): *Summary Background Paper for WG1: Human Aggressiveness and War*

Richard Benjamin (UK), J.E. Harris (UK) and N.A. Leadbetter(UK): *Peace Enforcement: Assessing the requirements, (also distributed to WG2)*

Maxwell Bruce (Canada/Malta): *The Culture of Peace*

Orlando Fundora López (Cuba): *Thoughts on the Elimination of War*

Klaus Gottstein (Germany): *Comments on the Background Paper for WG1*

Leonard Johnson (Canada): *Some Thoughts on World Governance*

Youri Matseiko (Ukraine): *Eliminating the Causes of War through a Culture of Peace*

Julius Rajčani (Slovak Republic): *The Causes of War and Aggressive Behavior*

J. Martin Ramirez (Spain): *The Human and Cultural Nature of War*

Shoji Sawada (Japan): *Comments and Some Thoughts*

Jean Pierre Stroot (Belgium/Switzerland): *War and Human Nature*

WORKING GROUP 2

Alexander Nikitin (Russia): *Summary Background Paper for WG2: Political and Economic Causes of War*

Frank Blackaby (UK): *On the Causes of War*

Sarah Bokhari (Pakistan): *Challenges to the C31 in South Asia*

Jonathan Dean (USA) *A Strategy for Ending War*

William Gutteridge (UK): *Armed Forces and Common Security: Cause of war or force for peace?*

Jean-Paul Hébert (France): *The Risk of Increased Dissemination of Armaments*

Jean-Paul Hébert (France): *Empire of Disorder and a New Arms Race*

Masako Ikegami-Andersson (Japan): *Anatomy of the TMD Development Project*

André Landesman (France): *The Importance of the European Union (EU) for Eliminating the Causes of War*

Saideh Lotfian (Iran): *Exploring the Causes of Future Wars in the Middle East*

Robert Neild (UK): *The Economic Causes of War*

Arpit Rajain (India): *Stability through Nuclear and Missile CBMs in South Asia*

Douglas Roche (Canada) *Political and Economic Causes of War*

Background Papers/Documents

William Epstein (Canada/US) *Nuclear Disarmament Commentary, published by the Lawyers' Committee on Nuclear Policy, New York. The NPT Still in Trouble, April 2000, Volume 2, no. 1. The NPT: Where do we go from here?, 9 May 2000, Volume 2, no. 2. The NPT: A positive step forward—but not enough, 24 May 2000, Volume 2, no.*

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Guido den Dekker, Antoinette Hilderling, Kenneth Manusama, and Arthur Petersen (SY Pugwash Netherlands): *From Human Insecurity to International Armed Conflict*

WORKING GROUP 3

Helen Watson (Ireland) and Jack Boag (UK): *Summary Background Paper for WG3: Ethnicity and Religion*

Amina Aitsiselmi (Algeria): *A Portrait of Algeria: The Struggle For Democracy*

Ulrich Albrecht (Germany): *War, Globalization and the State*

Noel Baptist (Australia) *Some Humanist Priorities for the 21st Century in International Affairs*

Hugh Beach (UK): *Ethnicity and Religion as Causes of War*

Branko Cvjetanovic (Croatia): *Kosovo: Epidemiology of Violence*

Hugo Estrella (Argentina) *Comments on the Background Paper for WG3*

Chip Gagnon (USA): [paper prepared for a book and presented here as background material] *The Yugoslav Wars of the 1990s: A critical re-examination of "ethnic conflict"*

Vladimir Knapp (Croatia): *Ethnicity and Religion as Causes of War: Some remarks for discussion*

Edy Korthals Altes (The Netherlands): *Challenge to Religions: From Confrontation to Cooperation*

Luis Masperi (Argentina): *Contribution of Scientists to the Understanding among Religions*

Dzenana E. Rezakovic (Croatia/Bosnia & Herzegovina):

The War in the Former Yugoslavia: The causes, solutions and future perspective of the region

Rouben Zargarian (Russia): *The Principles of Political Settlement of the Conflict between Azerbaijan and Nagorno Karabakh*

WORKING GROUP 4

Morris Miller (Canada): *Summary Background Paper for WG4: Poverty as a Cause of War?*

Noel Baptist (Australia): *Eradication of Poverty in Developing Countries*

Martin Kaplan (USA/Switzerland) *Linkages Between Poverty, Health Status and War*

Deok-Yeong Kim (Korea): *Cause and Prevention of Poverty-related War*

WORKING GROUP 5

Anne H. Ehrlich (USA), Peter Gleick(USA), Ken Conca (USA): *Summary Background Paper for WG5: Resources and Environmental Degradation as Sources of Conflict*

Kirill Babievsky (Russia): *Disposal of Chemical Weapons and the Environment*

Constanze Eisenbart (Germany): *Commentary on the Background Paper of WG5: Organization of Interdisciplinary Research on the Human Environment*

C.R. Hill (UK): *Can Pugwash Make a Difference?*

Lynne Hopkins and Martin Kaplan (USA/Switzerland): *The Underground War: I. An Overview of the Environmental Impact of Landmines and II. Current Anti-mine Technological Research*

Jad Isaac (Israel) *Resource Scarcity and Sustainability of Peace in Israel and Palestine*

Anthony Turton (South Africa): *Water Wars: An Enduring Myth or an Impending Reality?*

Xie Jin (China): *Environmental Problems: Not a Simple and Single Problem*

WORKING GROUP 6

Michael Atiyah (UK), Ralph Benjamin (UK), Ana María Cetto (Mexico), Matthew Meselson (USA), Joseph Rotblat (UK): *Summary Background Paper for WG6: Misuse of Science*

John Avery (Denmark): *Misuse of Science*

Nola Dippenaar (South Africa): *Genetic Engineering and Gene Therapy in Humans*

Joanne Etheridge (Australia/UK): *Military Funding of Scientific Research*

Masako Ikegami-Andersson (Japan): *Will Science and Technology Solve the Security Dilemma? Anatomy of the TMD Development Project*

Liu Gongliang (China) and Tian Jingmei (China): *Commenting on the Background Paper for WG6: Misuse of Science*

Herbert Marcovich (France): *Knowledge but not Science can be Misused*

Peter Markl (Austria): *Science and the Ethos of Scientists in a New Context: Some Comments on the Draft Background Paper of WG6*

George Marx (Hungary): *Scientists in a Democratic Society*

Matthew Meselson (USA): *Averting the Hostile Exploitation of Biotechnology*

M. Srinivasan (India): *Comments on the (Summary) Background Paper for WG 6, "Misuse of Science"*

Background Papers/Documents

by **Sandra Ionno Butcher (USA)** and **Heather Stewart (USA):** *Student Pugwash USA's Pledge as a Step Towards Peace*

The CBW Conventions Bulletin, Issue no. 42, December 1998

Other

Ebrahim Motaghi (Iran): *The Role of Religion in Regional Conflicts*

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Participants

Ambassador (ret.) Ochieng Adala, Peace Advocate and Regional Coordinator, Africa Peace Forum (APFO), Nairobi, Kenya

Ms. Ruth S. Adams, Visiting Scholar, Institute on Global Conflict and Cooperation, University of California, San Diego, CA, USA

Prof. Ulrich Albrecht, Department of Political and Social Sciences, Free University, Berlin, Germany; Member, Pugwash Council

Dr. Jose Altshuler, President, Cuban Society for the History of Science and Technology, Havana, Cuba

Mr. Gothom Arya, Member, Election Commission of Thailand

Prof. Khairallah Assar, retired Professor of Social Psychology, University of Annaba, Algeria

Sir Michael Atiyah, President of Pugwash; Honorary Professor, University of Edinburgh, UK

Ms. Carin Atterling Wedar, Lecturer, History of Religion, Church History and Ethics; Visiting Scholar, The Scandinavian Theological Seminary, Gothenburg; General Secretary, Swedish Initiative for Peace, Security and International Relations (SIPSIR), Stockholm; Board Member, Swedish Pugwash Group

Prof. John Avery, Associate Professor of Theoretical Chemistry, H.C. Ørsted Institute, University of Copenhagen, Denmark

Dr. Prof. Kirill K. Babievsky, Member, Russian Pugwash Committee ; Institute of Organoelement Compounds (INEOS), Russian Academy of Sciences, Moscow, Russian Federation

Prof. Noel Baptist, retired Professor of Biochemistry, Faculty of Medicine, University of Ceylon, Sri Lanka

Prof. Gabriel Baramki, Consultant to the Ministry of Higher Education, Ramallah, Palestine; President, Palestinian Council for Justice and Peace ; Member, Pugwash Council

Dr. Sanjaya Baru, Member, National Security Advisory Board of India; Professor, Indian Council for Research on International Economic Relations, New Delhi

Prof. Patrick Bateson, Professor of Animal Behavior, University of Cambridge, and Provost of King's College, Cambridge, UK; Biological Secretary and Vice-President, Royal Society of London

Sir Hugh Beach, Board Member of VER-TIC and ISIS, London, UK

Mrs. Saïda Bédar, Researcher, Centre Interdisciplinaire de Recherche sur la Paix et d'Etudes Strategiques (CIRPES), Paris, France ; Editor (specializing in defense and geopolitical issues) for the French review *ARABIES*

Prof. Nansen Behar, Member of Parliament, Republic of Bulgaria; Director, Institute for Social and Political Studies (ISPS), Sofia

Prof. Ralph Benjamin, CB, PhD, DSc, DEng, FCGI, FREng, FIEE

Prof. Jack Boag, Emeritus Professor of Physics, Institute of Cancer, University of London, UK

Dr. Jeffrey Boutwell, Associate Executive Officer, American Academy of Arts and Sciences, Cambridge, MA, USA

Prof. Patrick Boyer, Q.C., Chairman, Pugwash Park Commission, Nova Scotia, Canada; Adjunct Professor, University of Guelph; President, Breakout Educational Network; President, Canadian Shield Communications Corp.; Practising Lawyer

Mr. Maxwell Bruce (Canada/Malta), Fellow, Foundation for International Studies, University of Malta, Valletta; President, Malta Pugwash Group

Prof. Francesco Calogero, Professor of Theoretical Physics, University of Rome "La Sapienza," Rome, Italy; Chairman, Pugwash Council

Prof. Ana María Cetto, Chair, Pugwash Executive Committee; Research Professor, Institute of Physics,

Universidad Autonoma de Mexico (UNAM); Member, Council, United Nations University; Member, Scientific Organizing Committee, UNESCO-ICSU World Science Conference

Mr. Chen Jifeng, Secretary General, Chinese People's Association for Peace and Disarmament (CPAPD), Beijing, China

Prof. Branko Cvjetanovic, Professor of Epidemiology, "Andrija Stampar" School of Public Health, University of Zagreb, Croatia

Dr. Marco De Andreis, CEO, Agorà i-content, Rome; former Member of the Cabinet of Commissioner Bonino, European Commission, Brussels, Belgium (1995-99)

Prof. Nola Dippenaar, Associate Professor, Dept. of Physiology, Faculty of Medicine, University of Pretoria, South Africa; Vice-Chair, South African Pugwash Group

Dr. Walter Dorn (Canada), Senior Research Fellow, Einaudi Center for International Studies, Cornell University, Ithaca, NY, USA ; Faculty Member, Pearson Peacekeeping Centre

Dr. Anne Ehrlich, Senior Research Associate and Associate Director for Policy, Center for Conservation Biology, Stanford University, Stanford, CA, USA

Mr. Inge Eidsvaag, Lecturer and Holder of Free Speech Grant, Lillehammer, Norway

Dr. Constanze Eisenbart, Senior Fellow (ret.), FEST, Heidelberg, Germany

Lt.-General Emmanuel A. Erskine, retired Army General, Accra, Ghana; Member, Pugwash Council; currently representing the Lessons Learned Unit of the UN/Dept. of Peacekeeping Operations in assisting the UN Training Unit in the implementation of the Guidelines for the Collection & Disposal of Small Arms by Peace Keeping Operations, the result of a study on Disarmament, Demobilization and Reintegration (DDR) of ex-combatants in a peacekeeping environment (for which he was consultant)

Dr. Joanne Etheridge (Australia/UK), Royal Society University Research Fellow, University of Cambridge, Dept. of Materials Science & Metallurgy, UK ; College Lecturer and Fellow, Newnham College, Cambridge

Dr. Esmat Ezz, Member, Pugwash Council; Professor, Military Medical Academy, Cairo, Egypt

Prof. Mari Fitzduff (Ireland/UK), Director, Initiative on Conflict Resolution and Ethnicity (INCORE), UNU Centre and the University of Ulster, and Professor of Conflict Studies, DerryLondonderry; Director, Peace Institute, Limerick, Republic of Ireland (1994-); Commission on Pluralism in Ireland, Dublin City University (1995-); Co-chair, Co-Existence Initiative, New York (1989-)

Prof. Richard Friend, Cavendish Professor of Physics, University of Cambridge, UK

Lic. Orlando Fundora Lopez, President of the Cuban Movement for Peace and People's Sovereignty, Havana, Cuba; Co-chairman of the World Peace Council (WPC); Coordinator of the World Peace Council for the American Continent

Prof. V.P. (Chip) Gagnon, Assistant Professor, Dept. of Politics, Ithaca College, Ithaca, NY, USA ; Visiting Research Fellow, Peace Studies Program, Cornell University

Prof. Federico García-Moliner, Professor of Contemporary Science, University "Jaume I," Castellón de la Plana, Spain

Air Marshal Sir Timothy Garden, Defence Editor, *The Source* (www.the-sourcepublishing.co.uk); Ass. Fellow, Royal Institute of International Affairs; Honorary Fellow, St. Catherine's College; Board member, Defence Evaluation & Research Agency Analysis Board; Visiting Fellow, Centre for Defence Studies, King's College London

Prof. Alexander Ginzburg, Member, Russian Pugwash Committee; Research Professor, Institute of Atmospheric Physics, Russian Academy of Sciences; Professor of Climate Change,

International University in Moscow; Director, Development and Environment Foundation; Consultant to Moscow Mayor Department

Dr. Peter H. Gleick, Director, Pacific Institute for Studies in Development, Environment, and Security, Oakland, California, USA

Acad. Vitalii Goldanskii, Member, Pugwash Council and Chair, Russian Pugwash Group; Director General, Joint Institute of Chemical Physics; Advisor of the Russian Academy of Sciences, Moscow, Russia

Prof. Klaus Gottstein, Emeritus Professor, Max Planck Institute for Physics, Munich, Germany

Prof. William F. Gutteridge, Professor Emeritus, Aston University; Director, Research Institute for the Study of Conflict & Terrorism (RISCT), UK

Mr. Ejaz Haider-Bukhari, News Editor, *The Friday Times*, Lahore, Pakistan ; Project Coordinator for Asia-Europe Dialogue (a project of Heinrich Boell Foundation, www.ased.org)

Dr. Karen Hallberg, Research Fellow, National Council of Science and Technology, Argentina; Professor, Balseiro Institute (Bariloche, Argentina)

Mr. Niclas Hällström, Assistant Director, Dag Hammarskjöld Foundation, Uppsala, Sweden; Board Member, Swedish Pugwash Group

Dr. David Hamburg, President Emeritus, Carnegie Corporation of New York, USA; Member, President's Committee of Advisors on Science and Technology (PCAST), The White House

Prof. John (Jack) Harris, Editor, *Interdisciplinary Science Reviews*, UK; Member, British Pugwash Council

Dr. Jean Paul Hébert, Engineer, Ecole des Hautes Etudes en Sciences Sociales (EHES), Paris, France ; Member of Economic Defense Council; Member, National Commission for Antipersonnel Landmines Elimination; Member, Central Council of the Ligue des droits de l'Homme et du citoyen

Prof. Christopher R. (Kit) Hill, Professor Emeritus, Institute of Cancer Research, Royal Marsden Hospital, Surrey, UK; Secretary, British Pugwash Group

Prof. Robert Hinde, former Royal Society Research Professor (now retired)

Prof. John Holdren, Teresa & John Heinz Professor of Environmental Policy & Director, Program in Science, Technology, & Public Policy, Center for Science & International Affairs (CSIA), John F. Kennedy School of Government, and Professor of Environmental Science & Public Policy, Dept. of Earth and Planetary Sciences, Harvard University, Cambridge, Massachusetts, USA; Visiting Distinguished Scientist, Woods Hole Research Center; Chair, Committee on International Security and Arms Control (CISAC), National Academy of Sciences; Chair, Panel on Reactor Options for the Disposition of Excess Weapon Plutonium, National Academy of Sciences; Member, President's Committee of Advisors on Science and Technology (PCAST), The White House

Dr. Masako Ikegami-Andersson, Assistant Professor, Department of Japanese Studies, Stockholm University, Sweden; Senior Lecturer, Center for Pacific Asia Studies, Stockholm University; Research Associate, Foundation for the Advancement of International Sciences, Tsukuba, Japan

Ms. Sandra Ionno Butcher, Executive Director, Student Pugwash USA; Washington, DC

Dr. Saiful Islam, President, International Study Group on Self-Organization, Munich, Germany

Mr. Thomas Johansson, Security Policy Analyst, Swedish Armed Forces Headquarters, Stockholm, Sweden, Executive Secretary; Swedish Pugwash Group

Dr. Venance Journé, Researcher, National Scientific Research Council (CNRS), Paris, France; Member, Pugwash Council

Prof. Serguei Kapitza, Senior Researcher, Institute for Physical Problems, Moscow, Russia

Participants, continued

Dr. Martin Kaplan (USA/Switzerland), Member, Pugwash Council; Director, Pugwash Conferences Geneva Office

Dr. Catherine M. Kelleher (USA/Germany), Director, Aspen Institute Berlin, Germany

Ms. Kaoru Kikuyama, Head, International Cooperation Planning, Japan Atomic Industrial Forum, Inc., Tokyo, Japan

Prof. Deok-Yeong Kim, Professor, and Head of Security Strategy Division, The Research Institute of National Security Affairs, Korea National Defense University (KNDU), Seoul, Korea

Prof. Michal Kleiber, Director, Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw, Poland; Professor, Department of Mathematics & Information Science, Warsaw University of Technology

Dr. Berma Klein Goldewijk, Programme Director, Centre for the Implementation of Economic, Social and Cultural Rights (CEDAR); Senior Researcher and Lecturer Human Rights, Institute of Social Studies, The Hague, The Netherlands

Mr. Johan van Klinken, Groningen Pugwash-Nederland

Prof. Vladimir Knapp, Professor (ret.) of Nuclear Physics and Nuclear Energy, Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia

Prof. Michiji Konuma, Member, Pugwash Council; Professor and Dean, Faculty of Environmental and Information Studies, Musashi Institute of Technology, Yokohama, Japan; Visiting Professor, University of the Air; Professor Emeritus, Keio University; Past-President, Association of Asia Pacific Physical Societies (AAPPS); Honorary Member, Hungarian Academy of Sciences

Drs. Edy Korthals Altes, Honorary President, World Conference of Religion and Peace (WCRP), New York, NY

Prof. Leszek Kuznicki, Professor, Nencki Institute of Experimental Biology, Warsaw, Poland

Dr. André Landesman, retired solid state physicist; Member, French Association “Réalités Internationales”; Member, French political club “Convictions”

Prof. Liu Gongliang, Vice Chief Engineer, Institute of Applied Physics and Computational Mathematics (IAPCM), Beijing, China

Mr. Sverre Lodgaard, Director, Norwegian Institute of International Affairs (NUPI), Norway; Member, Pugwash Council

Prof. Lee Lorch, Department of Mathematics and Statistics, York University, Toronto, Canada

Prof. Saideh Lotfian, Assistant Professor of Political Science, Faculty of Law and Political Science, University of Tehran, Iran; Deputy Director (*since February 1998*) and Senior Research Fellow (*since June 1994*), Center for Middle East Strategic Studies, Tehran

Mr. Dominique Loye, Technical Adviser, International Committee of the Red Cross (ICRC), Geneva, Switzerland

Mrs. Charika Marasinghe, Senior Lecturer, Faculty of Law, University of Colombo, Sri Lanka; Member, National Child Protection Authority; Trustee, Vishva Niketan International Peace Centre; Member, Executive Council, Sarvodaya Movement (largest NGO in Sri Lanka)

Amb. Miguel Marin-Bosch, Consul-General of Mexico in Barcelona, Spain; Visiting professor at the Pompeu Fabra University, Barcelona, graduate course on “Disarmament and International Security”; Member (and Chairman in 2000) of the UN Secretary-General’s Advisory Board on Disarmament Matters

Prof. Peter Markl, Institute of Analytical Chemistry, University of Vienna, Austria; Acting Vice President, Austrian Pugwash Group

Mrs. Pauline Marstrand, former Principal Lecturer (now retired) in Human

Ecology, Huddersfield (1984-87); former Senior Fellow, Science Policy Research Unit, University of Sussex (1969-80), UK

Prof. George Marx, Professor Emeritus, Department of Atomic Physics, Eötvös University, Budapest, Hungary; Physicist (nuclear physics); Honorary President, Hungarian Physical Society

Prof. Luis Masperi, Director, Latin American Centre for Physics, Rio de Janeiro, Brazil; Member, Pugwash Council

Prof. Jiri Matousek, Head, Department of Environmental Chemistry and Technology, Faculty of Chemistry, Brno University of Technology, Brno, Czech Republic

Prof. Yuri Matseiko, Chief Research Fellow, Institute of World Economy & International Relations, Kiev, Ukraine; Professor, Diplomatic Academy of Ukraine

Prof. Amitabh Mattoo, Chairperson & Associate Professor, Centre for International Politics, Organization and Disarmament, School of International Studies, Jawaharlal Nehru University, New Delhi, India; Secretary, Oxford and Cambridge Society of India

Mr. Lucius (D.L.O.) Mendis, Development Consultant, Colombo, Sri Lanka; Secretary/Convenor, Sri Lankan Pugwash Group

Prof. Matthew S. Meselson, Thomas Dudley Cabot Professor of the Natural Sciences, Department of Molecular and Cellular Biology, Harvard University, Cambridge, Massachusetts, USA

Acad. Jorma K. Miettinen, Academician and Emeritus Professor of Radiochemistry, University of Helsinki, Finland

Prof. Morris Miller, Professor and Consultant, University of Ottawa, Canada

Dr. Steven Miller, Director, International Security Program, Center for Science & International Affairs (CSIA), Harvard University, Cambridge, Massachusetts, USA; Editor-in-Chief, *International*

Security; Member, Pugwash Council; Co-Chair, U.S. Pugwash Group

Prof. Ramaranka Anderson Mogotlane, Vice Chancellor and Principal, Medical University of Southern Africa (Medunsa), Pretoria, South Africa; Director, MLS Bank; Professor of Applied Human Anatomy

Dr. Ali Akbar Mohammadi, President, Razi Vaccine and Serum Research Institute, Tehran, Iran

Dr. C. Raja Mohan, Strategic Affairs Editor, *The Hindu*, New Delhi, India; Convenor, Indian Pugwash Society

Dr. Michael Molitor (USA/France), Director, Climate Change Program, IGCC, University of California San Diego, La Jolla, CA, USA; Research Associate, Climate Research Division, Scripps Institution of Oceanography, La Jolla

Mr. Mike Moore, Senior Editor, *The Bulletin of the Atomic Scientists*, Chicago, Illinois, USA

Dr. Ebrahim Motaghi, Assistant Professor, Faculty of Law & Political Science, University of Tehran, Iran; Director of America Study Group, Center for Strategic Studies, Tehran (1999-present)

Prof. Marie Muller, Dean, Faculty of Humanities, University of Pretoria, South Africa; Director, Centre for International Political Studies, University of Pretoria; Chair, Pugwash South Africa; Member, Pugwash Council

Prof. Maciej Nalecz, Director, International Center of Biocybernetics, Polish Academy of Sciences (PAS), Warsaw, Poland; Member, Pugwash Council; Member: Polish Academy of Sciences, International Academy of Biomedical Engineering; Foreign Member, Russian and Georgian Academy of Sciences

Dr. Götz Neuneck, Senior Fellow, IFSH, Hamburg, Germany

Prof. Robert Neild, Emeritus Professor of Economics, University of Cambridge, England, UK

Dr. Alexander Nikitin, Director, Center for Political and International Studies (CPIS), Moscow, Russia; Deputy Chair, Russian Pugwash Committee of Scientists for Disarmament and International Security; Vice-President of the Russian Political Science Association; Professor, Moscow State Institute of International Relations; Member, Pugwash Council

Prof. Hitoshi Ohnishi, Dean, Faculty of Law, Tohoku University, Sendai, Japan

Dr. Hernán Pastoriza, Researcher, Centro Atómico Bariloche, Argentina; Research at CONICET

Dr. Sebastian (Bas) Pease, Member, Pugwash Council; Chairman, British Pugwash Group

Prof. Luiz Pinguelli Rosa, Full Professor and Vice-Director, COPPE-Post Graduate School of Engineering, Federal University of Rio de Janeiro (UFRJ), Brazil; President, Latin American Association of Energy Planning

Dr. Vesselin Popovski, Lecturer, University of Exeter, UK; Part-time Lecturer, King's College, London

Dr. Gwyn Prins, Principal Research Fellow, London School of Economics (LSE); Visiting Senior Fellow, Defence Evaluation & Research Agency (MoD); Senior Fellow, Office of the Special Adviser on Central & Eastern European Affairs, Office of the Secretary-General, NATO

Prof. Lea Pulkkinen, Academy Professor, Department of Psychology, University of Jyväskylä, Finland; Professor of Psychology (on leave)

Dr. Julius Rajcáni, Senior Scientist, Head of Department of Medical Virology and Pathogenesis, Institute of Virology, Slovak Academy of Sciences (SAS), Bratislava, Slovak Republic

Prof. J. Martin Ramirez, Professor of Psychiatry, Universidad Complutense, Madrid, Spain

Prof. Harold Ramkissoon, Professor in Applied Mathematics, The University of the West Indies, St. Augustine, Trinidad, The West Indies; Executive Secretary,

CARISCIENCE; Foreign Secretary, Caribbean Academy of Sciences

Prof. George Rathjens, Secretary-General, Pugwash Conferences on Science and World Affairs; Professor Emeritus, Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, USA

Prof. Martin Rees, Royal Society Research Professor, Cambridge University, UK

Prof. Judith Reppy, Professor, Department of Science & Technology Studies, Cornell University, Ithaca, New York, USA; Associate Director, Peace Studies Program; Co-Chair, U.S. Pugwash Group

Mr. Anthony de Reuck, former Head (now retired) of International Relations Department, University of Surrey, Guildford, England, UK

Prof. Dzenana Rezakovic (Croatia/Bosnia & Herzegovina), Head, CARDIONet Program (international education program in cardiovascular-vascular medicine); Founder of International Truth, Justice and Reconciliation Action 2000

Dr. George Ripka, Senior Physicist, Service de Physique Théorique, Centre d'Etudes de Saclay, France; President, French Pugwash Group

Senator Douglas Roche, O.C., Chairman, Canadian Pugwash Group; Chairman, Middle Powers Initiative; Chairman, Canadian Parliamentarians for Global Action

Dr. Stanislav Rodionov, Senior Scientist, Space Research Institute, Russian Academy of Sciences, Moscow, Russia

Sir Joseph Rotblat (UK), Emeritus Professor of Physics, University of London; 1995 Nobel Peace Prize Laureate; Member, Pugwash Council

Prof. Kalevi Ruhala, Professor, Department of Strategic and Defence Studies, National Defence College, Helsinki, Finland; Docent of International Politics, University of Tampere

Participants, continued

Dr. Roberto Guillermo Russell, Director of Academic Affairs, Institute of the Foreign Service, Ministry of Foreign Affairs, Argentina; Full Professor, University Torcuato di Tella, Buenos Aires

Prof. Shoji Sawada, Emeritus Professor, Department of Physics, Nagoya University, Japan

Dr. Walter Scheuer, now retired, formerly: Senior Project Manager (1989-93), Invap S.E. (a government-owned, advanced technology company); Senior Researcher/Head of Department (1953-1989), Argentine Atomic Energy Commission

Dr. Heinrich Schneider, retired Professor of Political Science, University of Vienna; Deputy Permanent Representative to the OSCE; Chairperson, Academic Board, Institut fuer Europaeische Politik

Prof. Ivo Slaus, Member of the Croatian Parliament, Zagreb

Prof. George Smith, Professor of Materials, Oxford University, UK; Managing Director, Kindbrisk Limited

Mr. Hussein Solomon, Research Manager, African Centre for the Constructive Resolution of Disputes, Umhlanga, South Africa; Council Member, South African Political Science Association; Research Associate, Centre for Defence Studies, University of Zimbabwe; Research Associate, Institute for Security Studies; Visiting Lecturer, University of Durban-Westville

Dr. Malur Srinivasan, Senior Adviser/Consultant, Tamilnadu, India; Member, Consultative Group of Senior Eminent Scientists, Government of India

Prof. Jean-Pierre Stroot (Belgium/Switzerland), retired Physicist, and President of the Board of the Geneva International Peace Research Institute (GIPRI), Geneva, Switzerland

Dr. Mark Byung-Moon Suh (Germany/South Korea), Member, Pugwash Council; Senior Researcher, Free University of Berlin, Berlin, Germany; Member, Advisory Council on

Democratic & Peaceful Unification of Korea

Dr. Olga Sukovic, Consultant, UN Department for Disarmament Affairs, New York; Scientific Adviser, Institute of International Politics and Economics, Belgrade, Yugoslavia

Dr. Mark Tamthai, Department of Philosophy, Faculty of Arts, Chulalongkorn University; Member of the University Council; Consultant to the National Security Council; Advisor to the Forum-Asia on Human Rights, Thailand

Acad. Prof. Albert Tavkheldze, President, Georgian Academy of Sciences, Tbilisi, Georgia

Dr. Giancarlo Tenaglia, voluntary Staff Member, Pugwash Conferences on Science and World Affairs, Rome, Italy; Member, Italian Pugwash Group

Dr. Tian Jingmei, Associate Professor, Institute of Applied Physics and Computational Mathematics (IAPCM), Beijing, China

Dr. Gérard Toulouse, Director of Research (CNRS), Ecole Normale Supérieure, Physics Laboratory, Paris, France; President, Committee for Exact and Natural Sciences (French National Commission for UNESCO); Vice President, French Pugwash Group

Mr. Anthony Turton, Head, African Water Issues Research Unit (AWIRU), Center for International Political Studies (CIPS), Department of Political Sciences, Pretoria University, Pretoria, South Africa; Consultant to Green Cross International in Geneva on water and state sovereignty

Dr. Vladimir Veres, Deputy Director, Independent Center for Strategic Studies, Belgrade, FR Yugoslavia; Member of the Board, Forum for International Relations-European Movement in Serbia

Dr. Antonis Verganelakis, Director of the Graduate School NCSR "Demokritos," Ag. Paraskevi Attiki, Greece

Mr. Tim Walker, Public Affairs Manager, Turner Broadcasting System Europe, London, England, UK

Dr. Mitchel Wallerstein, Vice President, The John D. and Catherine T. MacArthur Foundation, Chicago, Illinois, USA

Dr. Helen Watson (Ireland), Fellow at St. John's College, Cambridge, England; Tutor, Admissions Tutor, Director of Studies in Archaeology and Anthropology, College Lecturer in Social Anthropology

Ms. Harriet Wong, Website Coordinator, Pugwash International, American Academy of Arts and Sciences (AAAS), Cambridge, MA, USA

Dr. Rouben Zargarian, Counsellor, Ministry of Foreign Affairs, Republic of Nagorno Karabakh, Russia; Vice-Coordinator of the Committee of the Republic of Nagorno Karabakh, Helsinki Initiative '92; Head, Department of History, Modern University for the Humanities

STUDENT/YOUNG PARTICIPANTS

Ms. Amina Aitsiselini (Algeria), Student in Medicine, St. Catharine's College, Cambridge, England, UK

Mr. Björn Aust, Student, and Editor of the monthly journal *Anti-militarism Information* (a science-based journal on peace and conflict studies, background information and analysis on current conflicts and news from the German peace movement), Berlin, Germany; Lecturer on "media and war" (*Summer 2000*), Institute for Political Science, Free University of Berlin

Sarah Bokhari (Pakistan)

Mr. Patrick Brannac (USA/UK/Sweden), Undergraduate Student in Biochemistry, Imperial College, London, UK

Mr. Jan Braun (German), PhD Student, Dept. of Medical Microbiology, University of Edinburgh Medical School, Edinburgh, Scotland, UK

Mr. Guido den Dekker, Research Fellow and PhD Candidate, Department of International Law, University of Amsterdam, The Netherlands; Member, Board of Pugwash Netherlands; Affiliate

of the International Association of Lawyers Against Nuclear Arms (IALANA)

Mr. Hugo Estrella Tampieri, Advisor, Córdoba State Senate-Argentina

Mr. David Gomez-Ullate, Assistant Teacher, Department of Theoretical Physics II, Universidad Complutense, Madrid, Spain

Mr. Paul Guinnessy, Online Editor, *Physics Today*, American Institute of Physics, College Park, Maryland, USA ;

Ms. Eva-Jane Haden, President, Swiss Student Pugwash, Geneva, Switzerland

Mr. Tom Borsen Hansen, PhD Student, Royal Danish School of Pharmacy, Dept. of Medicinal Chemistry, Copenhagen, Denmark ; Contact Person for S/Y Pugwash Denmark; Member, Coordination group of “Forum of Philosophical Debate”

Mr. Joacim Jonsson, Undergraduate student in physics, University of Uppsala, Sweden

Ms. Lidija Kos-Stanasic, Research Assistant, Faculty of Political Science, University of Zagreb, Croatia; Secretary, Croatian Pugwash Group; President, Croatian Student Young Pugwash; Secretary, Croatian International Studies Association

Ms. Marina Krommenacker, Student preparing International Baccalaureate (May 2001), International School of Geneva La Chataigneraie

Mr. Vincent Lepage, “Science-po” degree, Post-graduate “Arms control and disarmament studies,” Université de Paris VII, France [formerly: Intern, Geneva Pugwash Office]

Michelle Lewin (UK)

Mr. William Marshall, Final-year undergraduate student, Department of Physics and Astronomy, University of Leicester, UK; UN Space Youth Advisory Council Member and Chair of Sub Forum of Philosophy of Space; Committee Member, UK Students for the Exploration and Development of Space;

Institute of Physics (UK) Student Committee Member

Ms. Audrey K. Nash, National Chapter Coordinator, Student Pugwash USA, Washington, D.C.

Mr. Andreas Østby, Post-graduate Student in Philosophy, Institute of Philosophy, Oslo, Norway

Mr. Maurice Pigaht (Germany), Undergraduate in Mechanical Engineering, Imperial College, London, UK

Mr. Arpit Rajain, PhD Candidate, Centre for International Politics, Organisation and Disarmament, School of International Studies, Jawaharlal Nehru University, New Delhi, India; Research Officer, Institute of Peace and Conflict Studies, New Delhi

Mr. Moritz Riede (Germany), 2nd-year Physics Undergraduate in Physics, St. Catharine’s College, Cambridge, England, UK; President, Cambridge University Student Pugwash

Dr. Carsten Rohr (Germany), Research Assistant, Department of Physics, Imperial College of Science, Technology and Medicine, London, UK; Chair, Student Pugwash, UK

Ms. Gina van Schalkwyk, final year Undergraduate Student, and Part-time Research Assistant, Department of Political Science, University of Pretoria, South Africa

Mr. Adam W. G. Sherrard, President, Canadian Student Pugwash, Montreal

Ms. Nanako Shimizu, Student, Faculty of Environmental & Information Studies, Musashi Institute of Technology, Yokohama-city, Japan

Ms. Heather Stewart, Pledge Program Coordinator, Student Pugwash USA, Washington, D.C.

Ms. Helen Turner, Student, Politics, English Literature, Sociology, Holy Cross College, Bury, England, UK

Mr. Viresh Vallabhbai, Master’s Student, International Relations, University of Witwatersrand,

Johannesburg, South Africa; Diplomatic trainee

Ms. Susan Veres, Senior Associate Director, Student Pugwash USA, Washington, DC

Ms. Xie Jin, Student; Chinese tutor, Kodak Ltd., Xiamen, China

GUESTS OF THE CONFERENCE/OBSERVERS

Ms. Mary Acland Hood, Director, Council for the Protection of Rural England, Somerset Branch

David Cope, POST, UK

Mr. T.K. Mukherjee, Institute for Defence Studies & Analyses (IDSA), New Delhi, India

Dr. Gordon Squires, Department of Physics, University of Cambridge

STAFF

London Pugwash Office—**Tom Milne**

Rome Pugwash Office—**Claudia Vaughn**

Cambridge MA Office—**Tracy Sanderson**

Former Pugwash Staff in the Rome Office—**Mimma De Santis**

Other Conference Staff—**Cliff Collins** and **Alison Wise**

The Future of the Nuclear Weapons Complexes of Russia and the USA

The Status and Prospects of Naval Nuclear Weapons and the Development of the Science-Industry Complex of the Russian Northwest.

28 May–1 June, 2000, St. Petersburg-Petrozavodsk, Russia

Report

by Jeffrey Boutwell

This was the sixth in a series of Pugwash Workshops on the challenges faced by Russia and the United States as the world's two biggest nuclear weapons states seek to manage the large industrial infrastructures underlying their nuclear forces in a time of global transition. More than 40 participants from eight countries attended various workshop meetings, including 30 scientists and policy specialists from numerous Russian research institutes (including the Rubin submarine design bureau) and environmental organizations. The meeting was organized and hosted by the Russian Pugwash Group.

The Current Nuclear Context

The workshop began with discussion of how revolutionary developments in global politics have not led to similar changes in how we think about nuclear weapons. Three recent events in particular help frame the discussion. First, the five traditional nuclear powers have accepted, in the UN Conference on Disarmament, their obligations to move toward elimination of nuclear weapons, in effect

delegitimizing the role of nuclear weapons in international affairs. At the same time, however, and this is the second point, we seem to have come to the end of formal arms control agreements with little thought on how best to proceed in a new era. Third and finally, there is the prospect of nuclear next use, of the chance that small nuclear exchanges will take place as more countries acquire, and seek to acquire, nuclear weapons.

It was noted that negative developments prior to the 6th NPT review conference held out little hope of reaching agreement on a consensus document. Discussion focused on nuclear *haves* vs. *have-nots*, with the New Agenda Coalition (seven nations: Brazil, Mexico, Sweden, New Zealand, Egypt, South Africa, Ireland) injecting a strong demand for moving toward elimination of nuclear weapons. The N-5 did finally produce a joint statement, focusing on additional progress in START while noting the need to “strengthen” the ABM Treaty (though the US gave a somewhat novel interpretation to what is meant by “strengthening” the ABM regime). The statement also contained an “unequivocal undertaking” on the part of nuclear weapons states to eliminating nuclear weapons. Emphasis was also given to the

importance of unilateral measures.

Yet progress in the reduction of nuclear weapons remains difficult. START II was signed in January 1993, yet not ratified by the Russian Duma until April 2000. Moreover, the Russian instrument of ratification contains conditions (e.g., article 9, where the exchange of instruments is conditional on US Senate agreement to both the US-Russian MOU on theater missile defense demarcation, and on Russian successor law). There is also article 2, paragraph 2, which identifies conditions that would allow (indeed, perhaps even require) Russian withdrawal from START II if the US withdraws or infringes on the ABM Treaty and the TMD demarcation agreement. A further complicating factor is the Duma taking a more activist role in overseeing implementation of the treaty. Thus, early entry into force of START II seems unlikely.

Factors influencing START III include a Russian preference for 1,000–1,500 systems compared to a US range of 2,000 (Clinton) to 2,500 (Joint Chiefs of Staff). A statement from Republican presidential nominee George W. Bush has indicated a willingness to go lower than 2,000 systems, but only if supported by the JCS and only if tied to deployment of

national missile defenses. As is well known, the US has already allocated funds under the 1999 NMD Act, and there is interest as well in sea-based missile defenses (e.g., proposals for 600 interceptors on more than 20 surface ships for boost-phase intercept).

It was noted that possible US-Russian compromises on missile defenses have been floated, where mutual agreement on changes to the ABM Treaty could be linked to lower levels of strategic forces in START III, getting rid of the MIRV ban (allowing 3-6 warheads on the Topol-M), and creating firewalls to prevent the deployment of full-blown national missile defenses. Yet such compromises will be difficult for a number of reasons, not least the asymmetry in US and Russian strategic forces (including the increased vulnerability of Russian ballistic missile submarines).

Naval Nuclear Issues

Regarding naval nuclear weapons in particular, significant changes in force deployments are taking place. In Russia, some 287 nuclear-powered

submarines (both attack and ballistic missile), containing more than 500 reactors, were built between 1954 and 1996. Today, at least 183 of these are out of service (and the number may be well above 200). Estimates are that 120 de-commissioned submarines still have fueled reactors in need of disposal.

Even before the sinking of the *Kursk*, the past decades have seen a string of serious naval nuclear accidents, the most notable being the loss at sea of two US and three (now four) Russian nuclear submarines.

In 1989, the *Komsomolets*, powered by a nuclear reactor and carrying two nuclear torpedoes, sank in 1600 meters of water in a heavily-fished area of the Norwegian Sea. Soviet authorities knew that the reactor had shut down, but little else. As with the *Kursk*, raising the *Komsomolets* was not possible because of hull damage. While there was initial concern of leaking plutonium because of hull corrosion, monitoring over the years has detected no radiation. On the other hand, lack of

funds has prevented recent monitoring, and suggestions have been made for on-station buoys that could warn of a change in the situation.

A different issue is that of disposal of nuclear waste and decommissioned nuclear reactors at sea. Although there are estimated to be 17,000 such containers in the Barents Sea, and 43,000 in the Pacific, a European Union program, *Spent Fuel Management in Northwest Russia*, concluded that it was not necessary to raise nuclear material containers from the ocean bottom. There is no evidence of plankton at depths of 1700 meters, thus little risk to the human food chain; plus plutonium spreads far more dangerously through the air than through either food or water.

In 1993, then President Boris Yeltsin ordered an audit of the fissile material problem facing Russian authorities. The result was the Yablokov *White Book*, which detailed a string of storage and handling problems throughout the facilities of the Russian Northern Fleet, at Murmansk and elsewhere.



Visiting the wooden architecture of Kizhi in Karelia.

The workshop reviewed the problems of nuclear pollution circulating throughout Scandanavia and northwest Russia. In addition to radioactive sources in the Barents, radiation has been carried over central Siberia from the Soviet test site in Novaya Zemlya, while radiation in the Irish Sea (from Sellafield) is carried up over northern Norway into the Barents Sea. Even radiation from the Chernobyl nuclear accident was carried into the Baltic where it ultimately made its way out to the North Sea and up around into the Barents.

Tests of caesium-137 in the Kara Sea point to 40 percent derived from nuclear weapons fallout and 55 percent from Sellafield; comparable figures for strontium-90 are 55 percent from nuclear weapons fallout and 30 percent from Sellafield. There are high levels of caesium-137 in fish in the Baltic and Irish Seas, while levels are low in the Barents and North Atlantic (up to 20 Bq/kg in former, less than 2 Bq/kg in latter). Regarding plutonium, nuclear waste from Sellafield (300 kg) into the Atlantic is greater than that from the *Komsomolets* (8.2 kg) or even from previous nuclear weapons tests (30 kg. in the Barents and Kara Seas). Regarding potential danger to humans, caesium is the most worrisome (in the food chain).

Nuclear Waste Repository

Given that current storage areas for solid and liquid fuels don't meet either Russian or international standards, planning is underway for long-term solutions. In the interim, fuel stored in submarines is safer, especially with operating cooling systems, until intermediate storage can be arranged.

The workshop discussed nuclear waste storage on the Kola peninsula, where feasibility studies have been done for granite repositories at depths of 150 to 200 meters, estimated to cost 200 million Euro. Locations on Novaya Zemlya are not feasible, both because of sandstone/ limestone strata and because global warming increases of eight degrees celsius could cause the repository to slide into the sea.

Will high level waste and resultant high temperatures lead to heat load and fracturing of granite? Participants thought not, as the use of barriers will contain temperatures to a maximum of 60 degrees celsius, alleviating the problem. Plus, the seismic situation is quite stable; boring holes 12.5 km deep reveal strata some 3.5 billion years old. Despite these positive indicators, Norway has expressed concern over the repository being close to the border and about the efficiency of the organizational effort and reliability of cost estimates. Several participants mentioned problems inherent in the Russian bureaucracy, where overlapping jurisdiction of the Russian Navy, Minatom, the defense ministry, and local governments collide.

Ocean Disposal of World War II Chemical Weapons

In 1946-47 following the end of World War II, an estimated 300,000 tons of German chemical weapons (mustard, phosgene, prussic acid, sarin) were confiscated and sunk in the Baltic and North seas. The Soviet Union disposed of such weapons, loaded on ships, in the Baltic, while the US and Britain sank German

chemical munitions in the Kattegat and Skagerrak straits between Norway, Sweden and Denmark. CW containers were dumped individually by fishing boats commissioned for the task, or loaded on ships and sunk.

Over the years, six mapping expeditions have identified their location, identified sediments and residues, and gauged their impact on the sea. Given the carcinogenic threat posed by chemical toxins, such sites are monitored even today by international teams, such as the Baltic Environmental Patrol. Sweden in par-

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The military will often downplay the significance of environmental threats (to minimize public interest), while local authorities sometimes over-dramatize the dangers (for purposes of political leverage and funding).
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ticular has been conducting research since 1992 on vessels sunk with chemical weapons.

Strong undercurrents and erosion of the seabed at times unearth weapons that had been buried for years. Given the still existing ecological threat, monitoring concentrates on hydrophysical characteristics (the interchange of waters between the North Sea and Baltic Sea) and on hydrobiological and microbiological analyses. There is the problem as well of fishing boats accidentally catching drums of chemicals in their nets; Polish fishermen have had fish confiscated due to contamination.



Kursk submarine (Photo: Federation of American Scientists)

While estimates differ on the dangers to Baltic fish stocks from these CW, a continuing concern is that of public perceptions, where a “Mad Cow” type scenario could develop, even if concentrations are low. Complicating the situation is the difficulty of government coordination, where different bureaucratic interests often conflict. For example, the military will often downplay the significance of environmental threats (to minimize public interest), while local authorities sometimes overdramatize the dangers (for purposes of political leverage and funding).

Of the chemical compounds involved, lucite (containing arsenic) and ipritus (difficult to dissolve) are considered the most dangerous compounds; others are hydrolyzed and become non-toxic. Micro-organisms tolerant of ipritus can swell to 90 percent of the total population of micro-organisms in particular locales. Self-purification also occurs, with micro-organisms breaking down some compounds. The biggest con-

cern appears to be that of the concentrated release of chemicals from loaded vessels in the Skagerrak. There is also a heavy overload of phosphorus and nitrogen in the Baltic (much from the Neva River) which is a grave concern.

Workshop discussion of CW ocean pollution noted that such problems need to be framed in an appropriate time-scale; actual toxicity is one issue (e.g., chemicals hydrolyze in water, reducing toxicity), while persistence of the problem is another. Risk assessment needs to take these and other considerations into account. There is also the question of comparative risk. Reactors with fission products and actinides pose greater risk than nuclear-armed torpedoes. An even greater risk is that of shipping spent fuel, which is susceptible to both accidents and terrorist action.

The Role of NGOs

International NGOs, such as the Bellona Foundation of Norway, are playing an ever increasing role in

highlighting major military environmental threats. In the UK, NGOs were especially important in highlighting the problems surrounding the Sellafield nuclear reprocessing plant.

Risk assessment depends on both scientific data and informed public debate being able to decide on priorities for action, which Pugwash is trying to do with different threats posed by varying types of radioactive and chemical materials, and which other international NGOs do regarding a wide variety of nuclear, biological, and chemical activities, information on which governments seek to keep limited.

For example, International Physicians for the Prevention of Nuclear War (IPPNW) has a program “Nukes are Not Enough” that includes joint programs with Sweden and Germany and Physicians for Social Responsibility in the US, as well as cooperation with the media to bring information about nuclear activities to the public. The publication in 1992 of *Atom Ohne geheimniß* (in German and Russian) showing, among other things, the location of nuclear sites on the Kola Peninsula, helped prompt Yeltsin to set up the Yablokov committee.

In light of the continuing case of former Russian Navy captain Alexander Nikitin, now with the Bellona Foundation, discussion turned to the extent to which information on nuclear issues is currently available in Russia. While the St. Petersburg city court ultimately dismissed the Nikitin case (after five years), and the Russian supreme court has so far upheld that ruling, changes in Russian law have now



made explicitly illegal the type of environmental research and writing engaged in by Nikitin. Moreover, the St. Petersburg prosecutor is seeking to re-open the case against Nikitin. Similar cases are now pending, and the situation today is less open than during the Gorbachev years.

In the Soviet era, public organizations were of course tightly controlled by the government. Today, there are 5,000 NGOs registered in Russia, with 500 of them very active. Yet several participants asked, where is the nuclear policy debate in Russia? There isn't much of one. Have Russian

NGOs been effective in forging links with members of the Duma, as this is one of the strongest ways to educate and influence policymakers?

As in other countries, there is also the issue of how the scientific community deals with public opinion that has lost faith in scientific data or the ability of scientists to be objective. NGOs in this regard play both a positive and negative role, both helping to inform the public about complex scientific issues but at times overly politicizing issues. For example, NGOs are often tempted to rush to the media too quickly with news

that could be easily sensationalized. Mention was made of France, where a good job has been done to educate the public on technology issues, such as civilian nuclear power. NGOs need to break out of their closed circle and talk to the wider scientific community.

As is true of Pugwash, Russian NGOs need to evaluate their particular strengths across a wide range of options, including: 1) providing information to the public; 2) ensuring and provoking serious debate on the issues; 3) influencing public opinion; 4) evaluating public policies; and 5) influencing policy.

EDITOR'S NOTE: The Alexander Nikitin case came to an end on 13 September 2000 when the Presidium of the Russian Supreme Court rejected an appeal from the State Prosecutor's office in St. Petersburg to re-open the case. Nikitin was originally charged in 1995 with high treason for allegedly revealing sensitive

information about Russian naval nuclear issues. Although acquitted in early 2000, Nikitin faced having his case re-opened and being charged under new statutes that were enacted in 1997 that brought federal law on state secrets into conformity with the Russian Constitution while at the same time expanding the definition of

such "state secrets." In a ruling that is final and permits no appeal, the Presidium of the Russian Supreme Court rejected arguments made by the State Prosecutor's office and brought the Nikitin case to an end. For more information, visit the website of the Bellona Foundation at www.bellona.no.

Participants

RUSSIAN PARTICIPANTS

Mr. Dmitri V. Bazegsky, Head of Department of the Ministry of the International Relations of the Republic of Karelia; *Petrozavodsk*

Rear-Admiral Tengiz N. Borisov, Deputy Head of the Department of the Military and Industrial Complexes of the Ministry of State Property of the Russian Federation; *Moscow*

Dr. Vera N. Brovkina, Chairman of the St. Petersburg Peace Council; *St. Petersburg*

Mr. Alexander I. Buchnev, Consultant of the Russian Federation Peace Committee; *Moscow*

Ms. Ane T. Bunde, Ph.D. Student (Political Science) University of Oslo, Norway; *Petrozavodsk*

Mr. Sergei I. Denisov, Advisor to the Chairman of the Government–Head of Republic of Karelia; *Petrozavodsk*

Mr. Valentina I. Eliseeva, Member of the Chamber (Regional Legislature) of Republic of Karelia, Deputy Chairman of Chamber's Committee of the Natural Resources, Ecology and Tourism; *Petrozavodsk*

Mr. Alexander F. Emelyanov, Program Director of the Russian Committee of the International Physicians for Prevention of Nuclear War–IPPNW–Russia, (formerly: Member of the Russian Parliament); *Moscow*

Prof. Georgy N. Fursey, Head of Section of the St. Petersburg Telecommunication University; Vice President of the Russian Academy of Natural Sciences; *St. Petersburg*

Dr. Igor V. Gonnov, Director of the Obninsk Business and Innovation Center; Advisor to the Chairman of the Scientific and Cultural Committee of the Council of Federation of the Federal Assembly of the Russian Federation; Secretary of the Obninsk Branch of the Russian Pugwash Committee; *Obninsk, Kaluga Region*

Prof. Eugeny A. Gorigledzhan, General Designer of the of the Central Designer Bureau of the Marine Techniques “Rubin”; *St. Petersburg*

Ms. Ninel T. Hakkarainen, Member of the Social and Ecological Union; *Petrozavodsk*

Prof. Kim I. Heiskanen, Acting Director of the Institute of Geology of the Karelia Scientific Center of the Russian Academy of Sciences; *Petrozavodsk*

Prof. Yevgeny P. Ieshko, Vice Chairman of the Presidium of the Karelia Scientific Center of the Russian Academy of Sciences; *Petrozavodsk*

Prof. Mikhail B. Ignatiev, Head of Section of the St. Petersburg State University for Aerospace Engineering; Chairman of the St. Petersburg Branch of the Russian Pugwash Committee; *St. Petersburg*

Mr. Jorgen H. Jergensen, Official Representative of the Council of Ministries of North States in Republic of Karelia; *Petrozavodsk*

Dr. Yuri A. Korenkov, Chairman of the State Committee of the Natural Resources of Republic of Karelia; *Petrozavodsk*

Dr. Lyubov M. Kulakova, Research Scientist of the Institute of Economy of the Karelia Scientific Center of the Russian Academy of Sciences; *Petrozavodsk*

Dr. Valeri V. Kuzick, Senior Scientists of the I.M. Sechenov Institute of the Evolution Physiology and Biochemistry of the Russian Academy of Sciences; *St. Petersburg*

Mr. Mikhail A. Lebedev, Executive Secretary of the Russian Pugwash Committee; Chairman of the Board of the Russian Student Pugwash; Russian Academy of Sciences, *Moscow*

Igor Leshukov, Research Director, Center for Integration Research and Programs, *St. Petersburg*

Prof. Nadezhda G. Medvedeva, Head of the Laboratory of Microbiology of the St.

Petersburg Scientific and Research Center for Ecological Security of the Russian Academy of Sciences; *St. Petersburg*

Dr. Tatiana V. Morozova, Head of the Department of the Social and Political Research of the Institute of Economy of the Karelia Scientific Center of the Russian Academy of Sciences; *Petrozavodsk*

Academician Nikolay N. Melnikov, Director of the Mining Institute of the Kola Scientific Center of the Russian Academy of Sciences; Member of the Presidium of the Kola Scientific Center of the Russian Academy of Sciences; *Apatity, Murmansk Region*

Ms. Ludmila B. Nefedova, Advisor to the Member of the State Duma of the Russian Federation; *St. Petersburg*

Dr. Alexander I. Nikitin, Deputy Chairman of the Russian Pugwash Committee; Director of the Center for Political and International Studies; Professor of the Moscow State Institute of International Relations; Vice President of the Russian Association of Political Science; Member of the Pugwash Council; *Moscow*

Mr. Dmitri S. Rybakov, Coordinator of the Karelian GreenPeace Association; *Petrozavodsk*

Prof. Anatoly I. Shishkin, Director of the Institute of Economy of the Karelia Scientific Center of the Russian Academy of Sciences; *Petrozavodsk*

Mr. Valery A. Shlyamin, Minister of International Relations of the Republic of Karelia; *Petrozavodsk*

Dr. Alexander I. Slabunov, Chief Scientific Secretary of the Presidium of the Karelia Scientific Center of the Russian Academy of Sciences; *Petrozavodsk*

Academician Igor D. Spassky, General Designer–Director of the Central Designer Bureau of the Marine Techniques “Rubin”; *St. Petersburg*

Participants

Mr. Andrey M. Spiridonov, Representative of Ministry of Foreign Affairs of Russian Federation in Republic of Karelia; *Petrozavodsk*

Prof. Mikhail A. Spiridonov, Head of Department of the A.P.Karpinsky All-Russian Scientific and Research Institute of Geology of the Ministry of Natural Resources of the Russian Federation and Russian Academy of Sciences; *St. Petersburg*

Dr. Mikhail V. Sukharev, Research Scientist of the Institute of Economy of the Karelia Scientific Center of the Russian Academy of Sciences; *Petrozavodsk*

Prof. Alexander Yu. Sungurov, President of the Center for Social and Political Research "Strategiya"; *St. Petersburg*

Ambassador Roland M. Timerbaev, Chairman of the Expert Council of the PIR-Center for Political Studies in Russia; (Formerly: Arms Control Negotiator (ABM Treaty, NPT, CTBT), Soviet / Russian Ambassador to IAEA and other international organization in Vienna); *Moscow*

Prof. Serguei M. Vakulovsky, Deputy Director of the Institute of the Experimental Meteorology; *Obninsk, Kaluga Region*

Prof. Rafael M. Yusupov, Director of the St. Petersburg Institute of the Information and Automation of the Russian Academy of Sciences; *St. Petersburg*

NON-RUSSIAN PARTICIPANTS

Dr. Sonia Ben Ouagrham, Senior Research Associate, Monterey Institute of International Studies, Center for Nonproliferation Studies, NIS Representative Office, Almaty, Kazakhstan

Mr. Ronny Bergman, Director of Research, FOA, Department of NBC Defence, Umeå, Sweden; Member of Research Committee (appointed by the Ministry of Environment), Swedish Radiation Protection Institute (January 1999-December 2001)

Dr. (Fredrik) Mikael Björnberg, Research Scientist, Technical Research Centre of Finland (VTT); Board Member, Myllykoski Oyj (international industrial company [forest industry])

Dr. Jeffrey Boutwell, Director of Programs, American Academy of Arts and Sciences, Cambridge, MA, USA

Prof. Francesco Calogero, Professor of Theoretical Physics, University of Rome "La Sapienza," Rome, Italy; Chairman, Pugwash Council

Dr. Renee de Nevers, Program Officer, The John D. and Catherine T. MacArthur Foundation, Chicago, Illinois, USA

Dr. Lassi Heininen, Senior Scientist, University of Lapland, Rovaniemi, Finland

Mr. Tore Killingland, Adviser for the Liberal Party, Norwegian Parliament; Assistant General Secretary, Friends of the Earth, Norway

Dr. Steven Miller, Director, International Security Program, Center for Science & International Affairs (CSIA), Harvard University, Cambridge, Massachusetts, USA; Editor-in-Chief, *International Security*; Member, Pugwash Council; Co-Chair, U.S. Pugwash Group

Dr. Gwyn Prins, Senior Research Fellow, Royal Institute of International Affairs (RIIA), Chatham House, London, UK; Visiting Senior Fellow, Defence Evaluation & Research Agency (MoD); Senior Fellow, Office of the Special Adviser on Central & Eastern European Affairs, Office of the Secretary-General, NATO

Prof. George Rathjens, Secretary-General, Pugwash Conferences on Science and World Affairs; Professor Emeritus, Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, USA

Rear-Admiral (Rtd.) Camille Sellier, Policy Adviser, Commissariat à l'Énergie Atomique, Bruyeres Le Chatel, France

Dr. Jorn Siljeholm, Visiting Scholar, Security Studies Program, MIT Center for International Studies, Cambridge, MA, USA

Commander (ret.) Harri Tielinen, Technical Energy Center of Finland (VTT) Energy consultant

Working Papers

Sonia Ben Ouagrham (Kazakhstan): Regional Aspects of Conversion in Russia

Mikael Björnberg (Finland): Initiatives for Mitigating Nuclear Risks in North-Western Russia

Lassi Heininen (Finland): International Negotiations and Aims to Reduce Nuclear Risks in the Barents Sea Region

Igor Gonnov (Russia), Oleg Luksha (Russia): Development of Innovative Infrastructure and High-Technology Small Firms in Obninsk: The first officially recognized science city of Russia

Igor Gonnov (Russia): The Experience and the Perspectives of the International Science and Technology Cooperation of the Russian Scientific and Research Centres

Roland Timerbaev (Russia): 2000 NPT Review Conference: Would it contribute to the strengthening of the nuclear non-proliferation regime?

2nd Pugwash Workshop on Intervention, Sovereignty and International Security

28–30 September 2000, Como, Italy

Report

by Jeffrey Boutwell

The second meeting of the Pugwash study group on *Intervention, Sovereignty and International Security* took place in Como, Italy, from 28–30 September 2000 and was attended by 24 participants from 19 countries. Pugwash gratefully acknowledges the support of the Municipality of Como and the Landau Network–Centro Volta in hosting the meeting, and the Rockefeller Foundation for providing travel and publication support.

Following welcoming remarks from the Mayor of Como, dott. Alberto Botta, and from Maurizio Martellini, Secretary General of the Landau Network-Centro Volta, the opening session began with a review of the major issues inherent in any discussion of the tensions existing between humanitarian intervention and national sovereignty, including historical and legal precedents, sovereignty v. individual rights, and whether a new regime in international affairs is evolving.

Changing Landscape of Humanitarian Intervention

Since the study group's first meeting (Venice, December 1999), several



Lake Como

events have further shaped the debate over humanitarian intervention: the ongoing crisis in Sierra Leone (most notably the arrival and failure of the UN intervention force); the 17 August publication of the Brahimi report; UN Secretary General Kofi Annan's call at the Millennium Summit for an extended UN role in the protection of human rights; and continued post-conflict tensions in Kosovo.

For some, the implications of these events are that international legal case law is reinforced for humanitarian intervention and that the success of the UK's Operation Palliser in Sierra Leone demonstrates a need to think more expansively of how to conduct military interventions (e.g., strategic raids that can

change the political equation on the ground without necessarily having to achieve victory). On the political side, however, the recommendations of the Brahimi report are caught in a vice, with there being no means to implement them. It seems clear that the UN is incapable of commanding and conducting the type of military intervention (deploying quick reaction forces) that could be effective in reversing a deteriorating situation.

Within the UN, Cuba and North Korea have blocked efforts at giving the Department of Peacekeeping Operations (DPKO) greater military competence (e.g., by appointing seconded officers). Combined with the UN's bureaucratic nature and the absence of strong US involvement,



the Kofi Annan initiative at the Millennium Summit raises more questions than answers regarding the UN's ability to be an effective command operation.

Accordingly, many in the group felt that the "franchising" of military operations will be necessary if the international community is to have the resources it needs for timely and effective intervention; more thought is needed on how to efficiently subcontract military operations, especially to deal with perceptions of double standards when it comes to committing troops. One problem of many with subcontracting, however, is that those who provide peacekeepers often expect to reap the economic benefits of reconstruction (a form of neocolonialism). In the case of Sierra Leone, for example, there is the problem of British troops providing training to local troops who are led by a former warlord.

In a discussion of how concepts of state sovereignty and individual human rights are evolving, one participant noted that both have been integrated since their origins in the 12th century, and that what is new is

the concept of international security, beginning with League of Nations in 1919, and evolving through the 20th century. What China, Cuba, North Korea, and others defend is a concept of absolute sovereignty, but sovereignty has never been absolute. In western countries, sovereignty is maligned by stressing its negative connotations, but sovereignty is a positive concept when grounded in equality (extending to both territory and the individual). Human rights in both international law and the UN charter have now become a "major legal net" of rules, procedures, statutes, albeit of a different character than the body of international law surrounding sovereignty. Another view stressed that the right of rebellion and self-determination, as epitomized by the American Revolution, is based on universal rights; in a similar way, the spirit of the UN Charter is in its preamble.

Problems arise with the tendency of powerful states to export their values, however worthy, through illegitimate means (e.g., the messianism of the French Revolution in exporting democracy). Comparisons today

would be countries exporting free-market and democratic values through trading policies (globalization) or through military means; noteworthy ends not always implemented by legitimate means.

How far can states go in acting without official UN sanction? The use of force in international affairs was not prohibited until the creation of the UN Charter (article 2), so there was a tradition of humanitarian intervention that evolved prior to 1945 that did not need the official sanction of a body like the UN. Some argue for a concept of legitimate countermeasures that can be considered lawful in counteracting blatant abuses of human rights and violations of humanitarian law; the corollary is that the actions of Russia and China in blocking effective action to deal with a situation such as Kosovo were illegitimate.

Other participants agreed that there are no absolutes regarding concepts of human rights, sovereignty, and intervention; the problem is one where western countries are seeking to impose their will on the majority. Moreover, the consequences of mili-



tary interventions often end up making the situation worse.

The United Nations

What measures could in fact strengthen UN humanitarian action? Changing the Security Council veto process was thought unrealistic, as was allowing the General Assembly to substitute itself for the Security Council (e.g., the 1950s Dean Acheson proposal). More feasible would be strengthening the UN's early warning and conflict prevention mechanisms. Some suggested a more active Secretary General (a la article 99) who acts as the conscience of the Security Council. In response, it was noted that Kofi Annan has been encouraged by the Security Council to act according to article 99, but is then reminded to be more of a Secretary and less of a General. In addition, as was evident during the Kosovo crisis, there is a fundamental split in the UN between the legal and political departments (anti-intervention) and humanitarian affairs (pro).

Regarding the *Millennium Report*, one should turn the question around, asking those with doubts

about intervention – just how should the international community respond to Rwanda, Srebrenica, etc.? One problem in forging an international consensus is that support for interventions among developing countries is not helped by the fact that the Balkans receive a majority share of UN post-reconstruction funds. Plus, the UN will never support interventions against the major regional powers, much less against the P-5. And, despite the moral imperative cited by Annan, the logistics difficulties of intervening in a country like the Democratic Republic of Congo (where seven different militaries are currently operating) will block that prospect. Oftentimes, the UN's problem in calling upon member states is that the willing are not able, and the able are not willing. Taking but the most recent example, India joins what it thinks is a peacekeeping force, not an intervention force, its relations with Nigeria sour, so it leaves Sierra Leone.

Where does the UN go from here? As noted in the Brahimi report, interventions/peacekeeping must be based on a well-defined mandate and

backed by appropriate resources, or they shouldn't be undertaken. The notion of an all-volunteer UN force is a non-starter; the G-77 won't agree to it, because they say it will be used against them, and the US won't agree because it will have to bear the cost. So, there will continue to be problems in getting timely authorization to use standby forces.

Looking at the larger picture, the UN has not even done proper reviews of how to conduct successful preventive diplomacy (only one success cited, between Iran and Afghanistan) and post-conflict reconstruction. Sentiments were expressed that humanitarian intervention does not have to be military intervention; a wide range of options and agencies are available, and early warning can be more effective than it has been.

Regarding US attitudes towards the UN, one participant expressed understanding for the criticisms of American exceptionalism, but thought that Americans should turn the question around – why is the US so often called in at the last minute to resolve problems that have been festering for years? Only through more

effective UN mechanisms for conflict prevention and collective intervention will the US not be the 'force of last resort.'

Another participant asked if groups like Pugwash could help the process by defining the criteria for intervention, which could then make humanitarian interventions more timely, more of an automatic process, and of a nature that targets those responsible rather than injures innocent civilians. One response was that the Security Council would never agree on "rules of the road" beforehand, but perhaps could reach agreement on general principles. The primary problem is that the number of UN mandates is increasing, but not the resources to carry them out. A particular problem is that, although the US is willing to pay 25% of the costs of authorized peacekeeping operations, it is billed by the UN for 30%, thus increasing the US debt and locking in an incentive for the US not to join peacekeeping efforts.

Politically, humanitarian interventions seem to be focusing at present on protecting ethnic minorities (and in a selective manner), rather than on protecting individual human rights (as in Somalia), which undermines the possibility of reaching consensus.

The point was made that the essential failure of the League of Nations was that it was asked to do more than it could; we should avoid the same problem with the UN. The UN and the Secretary General should be "norm setters." Sovereignty is about both power and legitimacy. The UN focus should be on peace-building, not continuing to fight

battles over where and when to intervene. This means less focus on chapters 6 and 7, and more on chapter 12. And wouldn't this be the best way to re-engage Russia, China and others in a collective UN effort?

Russia

The commissioned paper by Vladimir Baranovsky, "Humanitarian Intervention: Russia's Approaches," noted a diversity of Russian views on these issues, but stressed that criticisms of such interventions are similar to those found in other countries, particularly in regard to normative, messianic strains of humanitarian intervention "making the world safe for human rights" (ironically recalling how the Soviet Union imposed its values on others in the past). Feeling insecure and relatively weak, Russia will remain wary of humanitarian intervention. While Russia's approach to humanitarian intervention is evolving, its course will be largely determined by how self-confident Russia feels about itself.

The discussion that followed noted how the intervention/sovereignty debate is becoming one of "the West vs. the Rest", the rest including both countries who are intervened against, and the other great powers (the dissident great powers) who disagree with western concepts. The problem thus becomes one of: where do we disagree, why do we disagree, and what do we do about it?

To a large extent, the problem isn't one of humanitarian intervention per se, but of peace building and state building, and that a consensus is forming among the great powers on

these issues. Humanitarian intervention confuses and confounds the issues of human rights, democratization, etc., of the west imposing its values on others, which issues really come into play in post-conflict reconstruction.

Why do we disagree? There are four reasons: (1) the impact of history (and the Soviet legacy), which makes the Russians neuralgic about Western interventions once seen as the tool of "imperialism" and which de-sensitizes them to the implications of their own interventions in nearby states. The latter then opens them to the charge of hypocrisy and clumsy double-standards. (2) Self-interested fears, that NATO unilateralism might be applied to Russia, or in Russia's immediate vicinity, something which, while utterly implausible to most Western observers, figures easily in Russia's prevalent worst-case analysis. (3) Humanitarian interventions and the reasons for them tend to be a low priority among Russian politicians and the elite, given the scale of problems with which they are wrestling at home and in their own neighborhood. (4) While the first three factors have parallels for China and India as well, the fourth factor is unique to the Russian case: Russian disaffection with the West and the United States' approach to humanitarian intervention owes in part to the steady deterioration in the overall relationship with the West and the United States. General frustration finds expression in tangible cases like Kosovo.

What then to do? One needs to surmount the problem of great power irresponsibility in the first decade of

the post-Cold War era. That is, one needs to overcome the unwillingness of the great powers – whether the US, Japan, China, Russia or major European states – to make major sacrifices and run substantial risks to address the underlying problems at the root of what become crises requiring “humanitarian intervention.” In short, the great powers have done far too little to aid with the formidable state building and rebuilding tasks that, when beyond the wit and resources of societies caught in their grip, serve as the single most important threat to international peace and stability. As for the case of humanitarian intervention itself, there should be a basis for consensus between the West and the “dissident major powers.” Provided the West is prepared to respect their concern over procedure and agency, they are likely to accept the legitimacy of forceful intervention to stop massive violations of fundamental human rights, including genocide.

Discussion of Russia noted its attributes as both a superpower and a super problem (with the former deriving in part from the latter). Russia is a critical actor in a critical region (the post-Soviet space). This, along with two other attributes (its UN veto, nuclear weapons) makes Russia a great power. Russian (and other) criticism of the US is that the US is being a superpower on the cheap, engaging in unilateralism when and where it wants. A second can of worms is that the high threshold of genocide and ethnic cleansing on which you might get agreement beforehand doesn’t cover all the cases of peace and state building on which

the great powers and the UN should devote their resources (the post-Soviet space among many others). We have an extraordinary moment where the absence of strategic rivalry makes possible new dynamics of great power relations for peace building. Strategic rivalry is reappearing, however, especially in the post-Soviet space.

The discussion noted how NATO’s Kosovo operation was one of several reasons why Russia used more force in the second Chechen war. Also, Moscow could point to human rights abuses in Chechnya between the first and second conflicts as a legitimate pretext for Russia intervening. For most Russians, Kosovo did little to promote the validity of humanitarian intervention.

There is also the downside of overloading the concept of humanitarian intervention, of trying to have it do too much. While one can sympathize with the normative values

underlying the concept of humanitarian intervention, one should be equally cautious about wreaking too much collateral damage (to civilians, to the international system) in carrying out such interventions. We should adhere to the medical edict of “do no harm,” and more rigorously analyze concepts of the “legitimate use of force.” To the two current variants permitted by the UN Charter (in self-defense and to ensure international peace), a third variant is needed that better defines and circumscribes the use of force for humanitarian aims. One should be especially cautious of defining modes of humanitarian intervention as a means of fighting terrorism. In short, cooperation, responsibility, and accountability need to be essential components of humanitarian interventions.

The Post-Soviet Space

Discussion of the conflict between Georgia and Abkhazia focused on the



Kosovar refugees (UN Photo #202465)

relationship of conflicts and secession, and the need for conflict prevention on the part of international community. History is the story of nations and empires changing, being created, dissolving; yet many still believe sovereignty should have a clear priority over self-determination. It was especially ironic that the administrative borders within the old Soviet Union (itself an unusual creation) automatically became national borders following the dissolution of the USSR. Georgia then voided the legal relationship it had with Abkhazia (an autonomous republic within Georgia) to incorporate it, leading to armed conflict.

A different view held that the particular name or status of a territory is of less importance than the fact that this territory protects the individual human rights of its citizens. Clearly, the international community did not give enough thought to the consequences of the break-up of the Soviet Union. Georgia was upset over Russian intervention to help Abkhazia, and Abkhazia in turn voiced the possibility of asking for NATO's help. Parties to a conflict naturally turn to external sources of help – i.e., intervention. Humanitarian intervention can not be applied subjectively to aid one side or the another in a particular dispute of sovereignty vs. self-determination. The UN needs to be restructured to be more flexible and responsive to such cases, before they lead to armed conflict.

Widening the discussion, it was noted that there is a fundamental paradox that intervention won't happen without self-interest, but inter-

vention based on self-interest is often one-sided. What about Somalia, though, where the US had no special interests? Other participants disagreed, saying the US role was not totally dis-interested, as American domestic politics played a large role in prompting President Bush to send US troops. Much the same was true in Australia taking the lead on East Timor. It used to be that the UN didn't want neighboring countries or others with direct interests to provide peacekeepers, but as peacekeeping has become more dangerous, only those countries with definite interests will be motivated enough to provide troops.

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Regarding the post-Soviet space, international interventions are very unlikely, so it is up to national authorities, NGOs and other actors to engage in conflict prevention and resolution. The track record of such efforts is not very encouraging; e.g., there has been an OSCE Minsk group on Nagorno-Karabakh in existence for years, but it's not very successful.

Kosovo clearly symbolized Russian and Chinese sensitivities about secession and self-determination. One participant cited the Ted Robert Gurr article in *Foreign Affairs* about the dwindling number of conflicts due to secession because nation

states have been more willing to grant autonomy to minority populations. Others demurred, saying that latent conflicts in the post-Soviet space stemming from self-determination are not resolved, and Gurr may be missing these. Multilateral institutions could have played a more direct role with Russia in managing the break-up of the USSR, at least until 1993. Russia must be accountable in the role it plays; it should work with organizations like the OSCE and the UN; actors such as Ukraine and others who have regional interests should also be involved.

China and East Asia

The commissioned paper by Chu Shulong, "China, Asia and Issues of Sovereignty and Intervention," described three categories of attitudes on intervention and sovereignty in the region: a non-traditional group of countries (Japan, South Korea) that is more integrated in the international system and that supports some concepts of intervention; a middle group (ASEAN countries) that has shifted in recent years to accepting notions of interdependence and the need at times for intervention; and the traditional group (China, North Korea, Burma, Vietnam) that strongly defends the principal of non-interference in internal affairs.

In noting the different characteristics of the three categories of East Asian states, the traditional group consists of states that are totalitarian, one-party, with poor records on human rights, but with a desire for incorporation into the world economy, and (in the case of China) to be in the G-8. Non-traditional states are

democratic, pluralistic, and are integrated into the world economy (they are part of the G-8 or are taken account of by the G-8). The middle group are transitional democracies, single-party hegemons with fragile economies, ambivalent on human rights, and semi-peripheral and ambivalent about their place in the world economy.

China's attitude is based on historical experience (19th and 20th century imperial incursions into China) and its multi-national composition (56 nationalities, with many minorities living in border areas). Demands for independence for Tibet, Xingjiang and other areas heighten Chinese sensitivity to issues of intervention and sovereignty. While neighboring India accepts that Tibet is an autonomous region of China, for example, many in India protest Chinese policy in Tibet.

Above all, there is the issue of Taiwan, which is *sine qua non* considered an internal Chinese affair. Taiwan remains the most important and sensitive issue to be resolved, and the one that could most easily spark conflict in East Asia. And, China's stand on Taiwan influences its positions on other matters, as when China blocked Macedonia's request for the stationing of UN troops during the Kosovo crisis (to which one participant wondered whether the Chinese veto itself wasn't a denial of Macedonia's sovereign right to self-defense).

Despite China's sensitivities on Tibet, Taiwan and other issues, it was thought that processes of globalization and of China becoming integrated into the international econ-

omy are leading to changes in Chinese policy and attitudes regarding modalities of intervention. Others noted that the international community has a vested interest in facilitating Chinese integration into the world community, and of demonstrating that the security interests of the Middle Kingdom are best served by enhancing human security in the rest of the world. China is evaluating different types of conflicts on their own merits and making decisions as to the legitimacy of its involvement in international actions.

While China has legitimate concerns about intervention, stemming from its historical experience and humiliation, these concerns are less valid regarding anxieties that other countries will interfere in its internal affairs. There is a need to think of intervention in the context of enhancing individual and human security more broadly, not in legalistic terms of humanitarian intervention. Yet Kofi Annan's emphasis on human security (as opposed to borders, territorial integrity, etc.) was not well received by the G-77. While there is a need for a UN human security report (similar to its human development report), G-77 sensitivities are too great. In this vein, several participants took issue with the premise that the West can somehow "help" China move toward a greater acceptance of humanitarian intervention. It was noted that the concept of human security will be slow to take root in China, given less emphasis on the individual in Chinese society.

In terms of regional dynamics, opinions were expressed that ASEAN/ARF is a particularly ineffec-

tive institution on security issues (cases cited were Indonesia, the South China Sea, the Koreas).

South Asia

The commissioned paper by Radha Kumar, "Sovereignty and Intervention: Opinions in South Asia," noted that, while attitudes regarding intervention and sovereignty in South Asia are changing, such notions are still largely defined within the context of de-colonization. Positions taken on international issues have been rather formal and not deeply felt, unlike sentiments regarding regional South Asia issues that are of interest to the international community. Two prime examples are Bangladesh (East Pakistan) and Sri Lanka (and lessons learned in the latter are seen as applicable to Bosnia and Kosovo). When peacekeeping turns to kingmaking, however, disaster happens. Following its experience in Sri Lanka, India has gradually withdrawn from the international peacekeeping arena, the latest example being the removal of Indian troops from Sierra Leone.

In Pakistan, a previous emphasis given to alliances over unilateralism and sovereignty is changing due to the experience over Afghanistan. This is also seen in a Pakistani shift over Kashmir from advocating international involvement to stressing that Kashmir is more a bilateral issue with India. Within South Asia, Sri Lanka is the most open to international mediation.

The notion of exceptionalism is fading, that conflicts in South Asia are unique, though the consequences of this are more for notions of sover-



Pakistani peacekeeper in Haiti (UN Photo # 187339)

eighty (i.e., greater acceptance for devolution of political power to defuse internal conflicts) than support for intervention.

Comments included the point that South Asia has no regional forum or architecture in which to try and resolve regional problems. Pakistan and India have both engaged in unilateral acts which have exacerbated problems between them (Bangladesh, Jammu/Kashmir). India's fear that Sri Lanka might gravitate to the west led to interventions in that country, which worsened the situation and helped contribute to the defeat of the Indian peacekeeping measure.

A new element is the nuclear factor and the introduction of delivery vehicles and advanced conventional weapons. India's acquisition from Russia of conventional weapons that Pakistan sees as excessive and which Pakistan can't match, increases its reliance on nuclear deterrence. For this reason, one participant hoped

that Pakistan and India might be more willing to accept international initiatives on Kashmir, and possibly on nuclear stability as well. Yet how does the nuclear factor affect Indian and Pakistani perceptions of intervention and sovereignty? Would India joining the Security Council make it more, or less, willing to support peace enforcement? Given resentment over western intervention to prevent Pakistan and India from acquiring nuclear weapons, and the feeling of many in the subcontinent that the acquisition of nuclear weapons is the supreme expression of the sovereign right to self-defense, the nuclear factor only complicates the picture.

Participants thought it difficult to imagine any kind of regional security arrangement for South Asia. This is an important point regarding Afghanistan, where Pakistani dependence on the Taliban is becoming increasingly worrisome, given terrorism in Pakistan, possible mischief

against China, and the Taliban exporting its ideology to central Asia. Pakistan is conferring with Russia on Afghanistan, while some in Russia are calling for intervention to deal with the Taliban. The point was made here that support for terrorist groups can often come back to bite the hand of the supporter (Iraq-Iran; Israeli support to Hamas).

It was noted that Indian policy is one of strong support for sovereignty as a cornerstone of the UN, while also actively involved in UN peace-keeping missions, as well as unilateral peacekeeping with the concurrence of the target state (Nepal –1950; Sri Lanka-1971 and 1987; Maldives-1988). While mistakes were made in Sri Lanka, the intervention was requested by the Sri Lanka government, and India's aim was to maintain Sri Lanka as a unitary state. Mention was also made of cases of Indian intervention without consent; Junagadh (1947), Hyderabad (1948), Goa (1968), East Pakistan (1971), which some saw as illegitimate.

Recently, India has become very uneasy with mission creep in UN operations that verge more on peace enforcement than consensual peace-keeping. Yet if the UN can only undertake peacekeeping with the consent of the target country, how can it respond to a situation like Rwanda?

Africa

The commissioned paper by Adekeye Adebajo and Chris Landsberg, "The Heirs of Nkrumah: Africa's New Interventionists," noted how, with Africa just emerging from its colonial past, the founders of the Organization

of African Unity in 1963 put a premium on consolidating sovereignty, even at the expense of freezing colonial borders. Strongly emphasizing the principles of sovereignty and non-intervention, the OAU Charter permitted exceptions only for support of national liberation movements. Interventions even partially related to the defense of human rights, such as that by Tanzania to topple Idi Amin, were rare indeed.

Today, the situation is very different. First came the end of the Cold War, with its legacy of superpower and post-colonial interventions. There has also been the breakdown of two post-colonial taboos: the inviolability of borders and secessions through the use of force (Eritrea, 1993). While the continent is still grappling with the legacy of artificial borders, a combination of moral imperatives (decolonisation, apartheid, genocide) and strategic aims (economic, political) is propelling the case for interventions, by Africans, in Africa.

Accordingly, in recent years the OAU has been reviewing the need for military capabilities, reviving the 1960s dream of Kwame Nkrumah that the OAU set up an African high command. OAU conflict management and early warning capabilities are being developed, along with the increased use of electoral observer missions, and even small military observer missions (though with mixed results), in Rwanda, Burundi, and the Comoro Islands. At the subregional level, ECOWAS and SADC are likewise seeking to develop conflict mediation and prevention mechanisms.

Yet the current situation in Africa is that small states are more willing to intervene, but lack the necessary resources. Among the larger states, South Africa for most of the 1990s was unwilling to support and/or participate in interventions because of its apartheid past (e.g., Mandela resisted US pressure to commit South African forces in the Great Lakes). Only recently has South Africa, aided by the emergence of a legitimate Nigeria, become more proactive in the role it plays throughout the continent. Some participants cautioned, though, about overstating South Africa's ability, resources, leverage, and influence. President Mbeki's diplomacy is grounded in the fact that other African states aren't going to automatically respond to South Africa's wishes or lead.

For its part, Nigeria's main aim in West Africa has been to limit regional instability from Liberian conflict (750,000 refugees spilling outside borders), though its role did fuel regional concerns over Nigerian hegemony, especially during the period when Gen. Sani Abacha was essentially blackmailing the international community in return for Nigeria's role in West Africa.

Elsewhere, Lesotho was cited as an example of a benign intervention (legitimate, but not effectively carried out), where Zaire/DRC is a malignant intervention, essentially becoming Africa's first 'world war.'

Discussion focused on how Africa has attempted to deal with problems requiring intervention, most often on its own, with limited resources and without the help of international community. In addition

to ECOWAS and SADC, there is a third sub-regional organization, IGAD, comprised of seven East African countries. Though the IGAD emphasis was originally on drought and desertification, the organization has developed conflict resolution mechanisms and sought to apply them to Somalia and Sudan.

Several participants noted that the UN Security Council has not interpreted African conflicts in the same way that Kosovo was defined, as threats to international peace and security requiring UN action. For others, the sad reality is that the P-5 doesn't see a need for African involvement, as no national interests are at stake. For the US, a Somalia syndrome has replaced the Vietnam syndrome. Impartial peacekeepers may be preferred, but in the case of Africa, many UN Security Council members are so impartial that they have no vested interest in providing needed capabilities.

For most participants, then, the solution for effective intervention would appear to be a mixed model of direct involvement by regional organizations, supported by international resources. While interventions under a UN mandate are to be preferred, subregional capacity will have to be strengthened as the UN and international community can not always be counted on.

A final point was that human rights is hardly a Eurocentric concept, especially with Africa's experience of colonialism. In the end, however, the definition of terms is not as important as having a clearer understanding of what we want the concepts to convey and how to act on them. One

participant cited the four criteria for intervention listed in the study group's Venice workshop report as a useful starting point for seeking greater international consensus. The question remains, however, what happens after the intervention in terms of political reconstruction?

General Discussion

Intervention is often necessary, but not often successful. Yet how should the international community respond when criminals hijack the state? Participants cited the duty of the entire international community to become involved; through international organizations, legal channels, the media, NGOs, trans-national companies, and the scientific community.

The toughest issue will remain that of intervention, with military force, carried out against the will of the target. One participant listed three main criteria for such interventions: (1) clear threats to international peace and security; (2) gross violations of human rights; while it will be difficult to develop hard and fast criteria (and these can be manipulated for political reasons), general principles can be adumbrated; and (3) legitimacy (to what extent does international humanitarian law transcend the UN Charter?).

Customary law recognizes that the world evolves, and differing perspectives need to be aired if consensus is to be reached. The political objectives necessary for peace-building need to be clarified, as the military's main role is but to create the conditions for successful peace-building. This is a critical period in which

to show support for the UN and implement the Brahimi report. While the veto will continue to be a factor in Security Council deliberations, the question is how to minimize its use and maximize consensus.

When it comes to intrastate conflict, intervention is a case of the international community putting itself between the problem and the solution. In terms of the work of the study group, there is a need to focus on the three Ps: principles, publics, and process. One participant cautioned about moving too quickly to process issues (e.g., modalities of intervention), without having fully explored principles and publics. Regarding the latter, there is a vital need for developing arguments that can persuade politicians and public opinion as to why interventions serve both national and international security interests.

Also useful could be further analysis of the distinction between constructive intervention (conflict mediation) and coercive intervention (whether military or economic), and the differing stages of a crisis/conflict in which these can be applied. The work of Bruce Jentleson was cited regarding how an early resort to coercive preventive diplomacy might have been highly effective in preventing widespread misery in Rwanda, Kosovo, and East Timor.

Participants also noted that it is important to broaden our notions of what constitutes the "international community" and of how different actors (the private sector, civil society, the media) can help contribute to long-term success.

The problem should not be seen

as one of intervention per se, but of continued tension between sovereignty and intervention and the fact that intervention only takes place in countries where state structures are eroding; i.e., in developing countries, in precisely those countries that need sovereignty the most. What is needed are steps to support the state-building process. Intervention should be seen as a rare contingency; the less it's used, the more successful and stable the international community. Stable states are important as well because the very decision to intervene is a sovereign decision (in terms of contributing troops and funds to peace-keeping missions).

A more pointed criticism of sovereignty, however, is the "Westfailure" descriptor of Susan Strange, where the social contract inherent in state sovereignty has (1) failed to prevent governments from killing its own citizens (democide); (2) failed to equitably manage the international economy; and (3) failed to care for the global commons. There is an inherent conditionality of sovereignty that must be recognized.

In reviewing the workshop discussion and thinking of the future work of the Pugwash study group, four levels can be discerned:

The *descriptive*, of explicating differing national/regional views of intervention and sovereignty, which this workshop focused on;

The *conceptual*, of more sharply defining concepts of sovereignty, intervention, international security, and the international community;

The *operational*, of setting principles and criteria for when intervention is called for; devising

mechanisms for increasing the legitimacy of intervention (changes to the Security Council); proposing ways for intervention to be more timely and effective (UN volunteer force, standby forces, regional forces); non-military means of intervention (pre-conflict engagement, targeted economic sanctions, etc.);

Larger issues of international peace and security, of recognizing that intervention is an admission of failure, of a breakdown in security that was not solved by diplomatic and political means between the disputants themselves. Thus there is a need to go beyond intervention to think of structures and mechanisms that promote peacebuilding, collective security, and global governance (especially given our current window of opportunity to do something about this during an absence of strategic rivalry). In this regard there is a link between this intervention and sovereignty study group and Pugwash efforts to analyze the political and security requirements (security guarantees, conflict resolution mechanisms, and modalities of collective security) that would facilitate the transition to a non-nuclear world.

Thus caution is warranted about moving too quickly to issues of process and policy, when more work is needed on conceptual issues and for ways of thinking less in terms of intervention per se than in thinking of strategies for peace and state building. It is these types of issues that many thought should form the agenda for the next meeting of the study group, in Castellón de la Plana, Spain, in May 2001.

Participants

Ambassador (Ret.) Ochieng Adala, Africa Peace Forum (APFO), Nairobi, Kenya

Dr. Adekeye Adebajo (Nigeria), Senior Associate, International Peace Academy, New York, NY, USA; Co-editor, *International Peacekeeping*

Dr. Tanvir Ahmad Khan, Chairman, Institute of Strategic Studies, Islamabad, Pakistan

Prof. Gabriel Baramki, Consultant to the Palestinian Ministry of Higher Education, Jerusalem; President, Palestinian Council for Justice and Peace ; Member, Pugwash Council

Prof. Vladimir Baranovski, Deputy Director, Institute of World Economy and International Relations (IMEMO), Moscow, Russia

Dr. Jeffrey Boutwell, Associate Executive Officer, American Academy of Arts and Sciences, Cambridge, MA, USA

Prof. Francesco Calogero, Professor of Theoretical Physics, University of Rome "La Sapienza", Rome, Italy; Chairman, Pugwash Council

Dr. Chu Shulong, Senior Research Fellow, China Institute of Contemporary International Relations (CICIR), Beijing, China; Professor, Beijing University of International Relations

Dr. Kevin Clements, Secretary General, International Alert, London, UK; Professor, George Mason University, Fairfax, Virginia, USA

Prof. Paolo Cotta-Ramusino, Professor of Mathematical Physics, University of Milan, Italy; Secretary General, Union of Italian Scientists for Disarmament (USPID); Director, Program on Disarmament and International Security, Landau Network – Centro Volta, Como, Italy

Mrs. Nana Devdariani, Public Defender, Office of the Public Defender of Georgia, Tbilisi

Dr. Radha Kumar (India), Fellow, Peace and Conflict Studies, Council on Foreign Relations, New York, NY, USA

Mr. Christopher Landsberg, Lecturer, Department of International Relations, University of the Witwatersrand, South Africa

Prof. Robert Legvold, Professor of Political Science, The Harriman Institute, Columbia University, New York, NY, USA

Prof. Andrew Mack (UK/Australia), Director, Strategic Planning, Executive Office of the Secretary-General, United Nations, New York, NY, USA

Prof. Maurizio Martellini, Secretary General, Landau Network-Centro Volta (LNCV), Como, Italy; Professor of Physics, University of Insubria, Como, Italy

Prof. Alain Pellet, Professor at the University of Paris X-Nanterre, France; Member and former Chairman, International Law Commission of the United Nations

Dr. Gwyn Prins, Principal Research Fellow, The European Institute, London School of Economics, UK; Visiting Senior Fellow, Defence Evaluation & Research Agency (MoD); Senior Fellow, Office of the Special Adviser on Central & Eastern European Affairs, Office of the Secretary-General, NATO

Prof. George Rathjens, Secretary-General, Pugwash Conferences on Science and World Affairs; Professor Emeritus, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA

Dr. Jorge Rodriguez-Grillo, Political Officer, Cuban Peace Movement, Habana, Cuba; Professor, Methods of Investigation and Chancellor of the International Association of Educators for World Peace

Prof. Sergei Shamba, Professor at Abkhaz State University, Sukhum, Abkhazia

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Air Cmde. Jasjit Singh, Director, Institute for Defence Studies & Analyses (IDSA), New Delhi, India; Member, Pugwash Executive Committee

Prof. Ivo Slaus, Member of the Croatian Parliament, Zagreb

Dr. Gevorg Ter-Gabrielyan, Eurasia Programme Manager, International Alert, London, UK

Colonel Fiona Walthall, Assistant Director Peace Support Operations, Joint Doctrine and Concepts Centre, Ministry of Defence, Shrivenham, Swindon, UK

Interpreter:

Mrs. Nina Iskandarian, Interpreter, Moscow, Russia

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Papers
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COMMISSIONED PAPERS

Adekeye Adebajo (Nigeria) and Chris Landsberg (South Africa): *The Heirs of Nkrumah: Africa's New Interventionists*

Vladimir Baranovsky (Russia): *Humanitarian Intervention: Russia's Approaches*

Chu Shulong (China): *China, Asia and Issues of Sovereignty and Intervention*

Radha Kumar (India): *Sovereignty and Intervention: Opinions in South Asia*

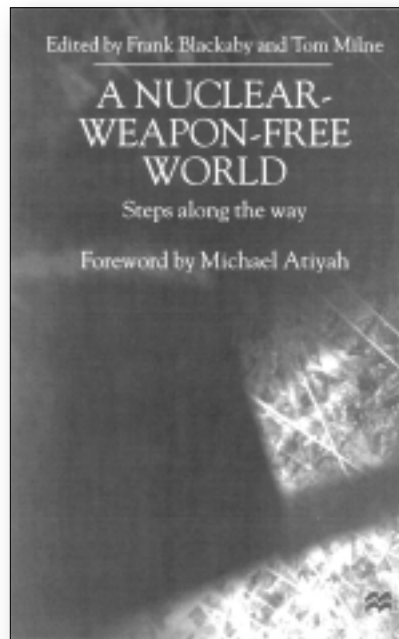
PROFFERED PAPERS

Corneliu Manole (Moldava): *Some Implications of the NATO Actions in Kosovo Conflict Concerning International Law: Rethinking the Sovereignty Concept*

Jorge Rodriguez Grillo (Cuba): *Intervention, Sovereignty and International Security*

Ivo Slaus (Croatia): *The Duty to Interfere and the Peril of Intervention*

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Pugwash Workshop on *Nuclear Stability and Missile Defense*

Sigtuna, Sweden, 26–28 October 2000

Report

by Jeffrey Boutwell

The Pugwash workshop on *Nuclear Stability and Missile Defense* was held Sigtuna, Sweden from 26-28 October. Hosted by the Swedish Pugwash Group, the meeting was convened at the Sigtuna Foundation, with support provided by the Swedish Ministry of Foreign Affairs and the Swedish Defense Research Establishment. The meeting was attended by 26 participants from 13 countries, all in their individual capacity.

The meeting opened with welcoming remarks from Bengt Gustafsson, chair of Swedish Pugwash and director of the Sigtuna Foundation, and Jan Prawitz, organizer of the workshop. The main address was given by Annika Markovic, director of disarmament affairs of the Swedish Ministry of Foreign Affairs. There was also a dinner for conference participants hosted by Director General Sture Ericson of the Swedish Agency for Civil Emergency Planning.

United States

The first session reviewed the history of American plans for national missile defense (NMD), which under

President Clinton called for deployment of 100 interceptors in Alaska by 2005 to counter emerging ballistic missile threats from so-called “states of concern” like North Korea, Iran, and Iraq. Following two of three unsuccessful program tests and significant opposition to NMD from Russia, China, and many European allies, President Clinton deferred a deployment decision on NMD in August 2000, leaving the issue open for the next administration.

An overview of the NMD plan stressed that is based on components (ground-based interceptors, early warning radars, X-band radars, etc.), many of which are well along in

development and which could be reconfigured in various schemes. The X-band radar sited in the Aleutians will be oriented towards Northeast Asia, while proposed upgrades to early warning radars in Massachusetts, Greenland, and the UK are designed to provide coverage of the Middle East. Ultimately, a third stage of NMD deployment calls for additional X-band radars (9), space-based IR radars (SBIRS), and a second deployment site in the continental US.

In the weeks before the US Presidential election on November 7, Al Gore voiced support for Clinton’s deferral decision, adding that ultimate NMD deployment must be techno-



logically viable, while not upsetting strategic stability or sparking a new arms race with Russia and China. George W. Bush criticized the Clinton NMD plan as too cautious, saying as President he would develop a more expansive system, including both naval and space-based assets.

Upcoming tests in February, 2001 shortly after the new President takes office, will be important (symbolically as much as technologically) in determining momentum toward a deployment decision. The attitude in early 2001 of America's allies, Russian policy, prospects for the ABM Treaty, are all additional important factors.

Clinton's delay of an NMD decision has spurred interest in other NMD options, especially in the Bush camp for sea-based and space-based assets. Yet the Clinton plan is the only feasible one for timely (i.e., 2005) deployment, and these other options (sea-based, boost-phase, TMD) should rather be seen as future complements to a land-based NMD. An early decision that President Bush could take is to increase the number of interceptors and deployment sites (e.g., in the northeast US).

Regarding the Thule (Greenland) and Fylingdales (UK) radars, there are alternatives if Britain and Denmark/Greenland say no to upgrading the radars; these include forward deployment of X-band radars on ships, or (less attractive), accelerating development of the SBIRS-Low missile tracking system. In any event, the Thule and Fylingdales radars are constrained by geography in providing any TMD capability; for this radars are needed in southern Europe to deal with the-

ater missile threats from the Middle East and northern Africa.

Claims by the Heritage Foundation and others that the US could quickly (2003) and cheaply (\$2-3 billion) deploy sea-based midcourse missile defense, based on Navy Aegis capabilities, are wrong. Over the longer-term, such sea-based systems could be a supplement to land-based NMD. While sea-based systems would still be dependent on land-based sensor systems, they could represent a way to expand coverage to US allies.

Boost-phase defenses, such as those proposed by Richard Garwin and Ted Postol, have their own inherent problems. One such is the call for joint US-Russian defenses based on Russian territory and the attendant difficulties of joint operational control. Moreover, the rapid response time and limited range of such interceptors will limit coverage to smaller countries like North Korea. A joint US-Israeli study on airborne laser systems for boost-phase defense is likewise years away from validation and development.

Finally, discussion of theater missile defenses (TMD) stressed the point that, for countries like Japan and Israel, TMD is in effect national missile defense for strategic defense of the homeland.

Russia

Russian attitudes on NMD stem from concern with the importance of strategic stability and the effect of NMD on additional substantial reductions of strategic forces, rather than any early threat that NMD could pose to the deterrent power of Russian nuclear forces. Moscow does

feel that the US is exaggerating the missile threat from "states of concern," and that long-term prospects of an expanded American NMD threaten the viability of the Russian deterrent.

Expert sentiment in Russia believes that Russia will not withdraw from arms control, even if the US proceeds with missile defense. Russia needs arms control constraints on US nuclear forces, as Russia will only have 800-1500 deployed warheads by end of decade. Yet, even if NMD did not exist, START III prospects are poor (in part because Senate and Duma ratification pre-conditions). Russia will wait for the US new administration to formulate its responses, so the re-emergence of the NMD debate probably won't come until summer or fall of 2001. In the meantime, however, Russia may continue to stress TMD plans involving Europe, and a global monitoring system derived from the US-Russia joint missile surveillance system, as alternatives to NMD.

In short, Russian policy is in flux, with Moscow feeling it has gotten short-changed in bilateral agreements but not wanting to totally do away with the constraints those treaties do impose on US forces. Russia has little leeway in expanding its strategic forces over the next decade (even with re-MIRVING). Substantively, then, in terms of constraints on strategic forces, the ABM Treaty is less important for the security it provides to Russia than as a debating point against the US.

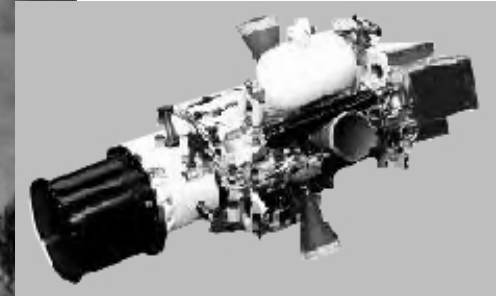
United Kingdom

The main British concerns expressed about NMD focus on issues of strate-

gic stability and the UK role in missile defense schemes. Since 1963, the Fylingdales radar has provided early warning capabilities and was upgraded in the early 1990s to a phased-array radar for 360 degree coverage. For NMD missions, Fylingdales would need software and informational technology upgrades. The RAF Menwith Hill facility would process data from space-based IR sensors (the SBIRS system will replace DPS for boost-phase early warning), but specific UK consent would be required. Phase two of the NMD program calls for three additional X-band radars, one of which could be in the UK which would also require UK permission (both at the national and local planning levels).

In the absence of a firm US decision to proceed, the UK government has remained non-committal, saying the ABM Treaty is a matter for the US and Russia. The Blair government has stressed the value of the treaty for strategic stability and wishes to see it preserved, but adds that the Fylingdales radar upgrade is unlikely to be the step that breaches the treaty. The Conservative Party has come out in favor of NMD, while the Liberal Democratic shadow Foreign Secretary, Menzies Campbell, has said that NMD would be “profoundly destabilizing” and could provoke “a new nuclear arms race.”

In a July 2000 report, the Foreign Affairs Committee of the House of Commons noted that a US request to upgrade the Fylingdales radar, having given notice to withdraw from the ABM Treaty, would present the UK government with an “acute dilemma,” and that a UK refusal would have



NMD booster (left) and kill vehicle (right). Photo: BMDO, US Department of Defense

“profound consequences.” In September, the Blair government responded by noting how allied concerns over NMD had been one of the factors in President Clinton’s deferral of an NMD decision. The next elections in the UK are likely in the spring of 2001, with the Labour Party likely to be returned to power.

Germany

There is widespread skepticism in Germany about American NMD efforts, both as a symbol of increasing American tendencies toward unilateralism and for the effect of missile defenses on east-west relations and nuclear stability. A particular fear in Germany is Russia responding with enhanced theater nuclear weapons that could increase German and European vulnerability. Or, emerging nuclear states could blackmail European countries. Germany is seeking to promote a common

European position and supports bilateral US-Russian agreement on what to do about the ABM Treaty. Should the ABM Treaty be voided, however, there are concerns that Russia might repudiate the CFE and INF Treaties.

While Germany favors a more pro-active policy regarding Iran, similar to that being pursued with North Korea, there is far more that Europe as a whole could do, including: new proliferation initiatives (missile free zones, disengagement zones, notification of launches), greater involvement in helping Russia dismantle nuclear warheads, and diplomatic initiatives focusing on the “states of concern,” all of which could help create the conditions for a global prohibition of nuclear weapons.

France

From Europe, there is a feeling that much has been made of the ramifica-

tions of NMD for Russia and China, with little analysis on how it ultimately involves US allies (both European and other). While many Europeans feel their concerns played a part in Clinton's deferral, there is ultimately no common European position.

Why are the Europeans important? Several reasons include: (1) the US needs their political support, both at home and abroad (and this is understood by Russia, as well); (2) technological dimension, including radar upgrades, and (3) as partners in coalition interventions. Other considerations include: what are the benefits of NMD to the Europeans? Thule and Fylingdales are of no use for TMD; radars would have to be based in southern Europe. Also, these radars are convenient political targets for Russia and domestic opposition. By contrast, the US argument about a lack of European support consists of: a lack of support will weaken defense cooperation; US-European interests will diverge; and European vulnerability will compromise their support for coalition interventions.

Does Europe need TMD? The answer is not clear, compared to more cogent rationales for TMD in the Middle East (for military reasons) and perhaps in East Asia (for insurance and political coupling). European TMD programs like the French ASTER are currently in limbo.

For one participant, issues of decoupling are beside the point (Europe has always been more vulnerable), as is the effect on deterrence. It's more difficult to say how NMD will affect arms control. The biggest impact of all would be the nature of changes on the international system if we truly

move to a defense-dominant world.

Tactically, one question is how to use the period before next summer or autumn to prevent Europe from being squeezed between US unilateralism and Russian pique. France and Europe need to encourage US-Russian talks on ABM renegotiation and to become more proactive on missile and CBW proliferation (especially in the Middle East and East Asia). Also helpful would be European work on surveillance, monitoring and intelligence assets related to weapons of mass destruction.

Sweden

Swedish concerns with NMD are similar to those voiced elsewhere: impact on strategic stability, undermining the ABM treaty, increased Russian deployment of theater nuclear weapons, and keeping the US coupled to Europe. The point was made that countries like Sweden can't have it both ways – trusting the US to ensure European security but not trusting the US to take decisions on its own security. There does seem to be increased European interest in theater missile defenses, and a connection was made between TMD and protecting international (including Swedish) troops in peacekeeping missions abroad. While Swedish government criticism of NMD would complicate Sweden becoming a member of NATO, it would not probably kill it.

Greenland

An overview was given of the domestic impact of the NMD debate in Greenland, particularly the difficulty of obtaining information about NMD and the reality that ultimate

decisions on upgrading the Thule radar will be made in Copenhagen. As a Danish colony until 1978, when it received home-rule powers, Greenland was subject to the US-Danish agreements in WWII (1941) giving the US air base rights, which were renewed in 1951. Despite the 1978 referendum on home rule, foreign affairs responsibility remains with Denmark, although Greenland's parliament (the Landsting) and government do have a role in debating foreign policy issues.

The three main political parties in Greenland are the Siumut (Social Democrats), Atassut (Liberals), and the Inuit Ataqatigiit. Though there are differences of opinion among the parties, sentiment in general (and especially among the majority Inuit population) on NMD is negative. For example, the Inuit party has called for the renegotiation of the 1951 military bases agreement, with the participation of the Landsting. Inuit issues also include compensation for loss of land at the US bases and the crash of a nuclear-armed aircraft near Thule in 1968. Debate on such issues is also shaped by the Inuit Circumpolar Conference (ICC), an international NGO representing the 160,000 Inuit peoples living in Greenland, Canada, Alaska and Siberia. These and other concerns are part of a wider sentiment in Greenland for increased self-rule and more representation in Danish delegations to international bodies.

The Danish government is keeping a low profile on NMD, wanting to defer any debate over the issue until the US takes a firm decision. There is some public sentiment in

Denmark for a demilitarized zone in the Arctic and for having the European parliament debate the NMD issue. Some in Denmark are also concerned about the Thule issue generating increased tensions with Greenland. On the particular question of how Greenland could affect the debate in Denmark (with only two members from Greenland in the Danish parliament), the ICC is seeking to mobilize Danish public opinion on the Thule issue.

Norway

The Norwegian government maintains that the Vardø radar is for research and tracking space debris, having nothing to do with NMD. Nonetheless, doubts remain, in part because the Vardø radar was tested in California in an ABM-mode before being moved to Norway, and because of previous government disinformation on sensitive military installations in Norway. That being said, Norway is on record opposing NMD, in part for its effect in blocking further cuts in nuclear forces.

As a neighbor, Norway is naturally sensitive to relations with Russia. In 2001, should the issues of NMD and NATO enlargement (there are nine candidates) come up simultaneously and should they be decided essentially unilaterally by the US, the effect on Russia would be formidable. One participant queried whether tradeoffs are possible between the two issues, for example by reaching an agreed amendment to the ABM Treaty while strictly limiting further NATO enlargement (Slovenia, Slovakia, and no others)? In the main, though, concern was expressed

that we may be seeing the re-emergence of east-west strategic rivalry.

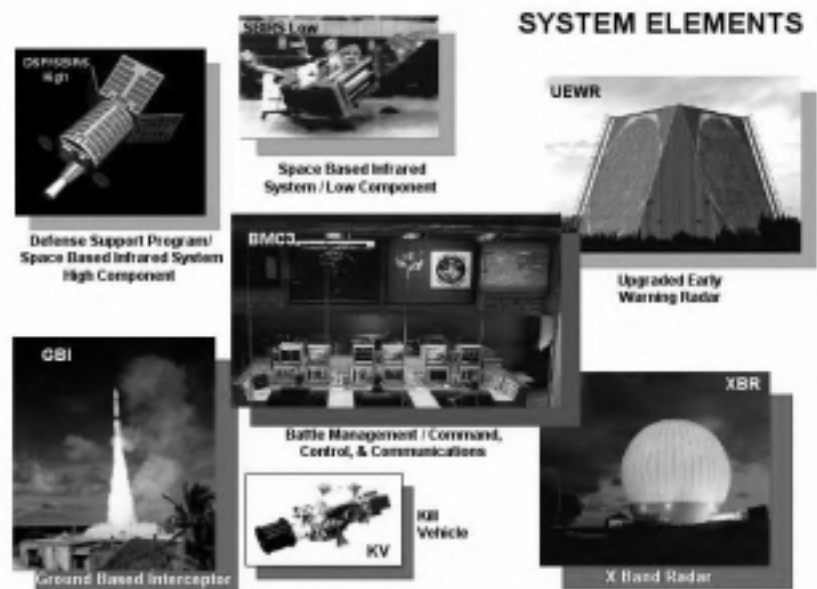
The US, Europe and Missile Defenses

One participant thought that Europe needs to anticipate a different debate by mid-2001, one much broader in scope than the Clinton NMD plan. Such issues could include: expanding missile defense to the allies (Richard Armitage and Allied Missile Defense) and even re-evaluating the relevance of the ABM Treaty and traditional arms control. Along these lines, a fundamental re-thinking of deterrence and MAD is necessary among the global nuclear powers (e.g., the George W. Bush call for deep cuts and expanded missile defenses).

Another view held that, while a unified European position on NMD would be ideal, this is unlikely to come about given various dividing lines between the European countries

(NATO/non-NATO, nuclear weapons/no nuclear weapons, those hosting radars/those not, and differing sensitivities to ballistic missile threats).

Perhaps the primary issue for the European states is, how willing are they are to risk rupture with the US over the NMD issue (in effect telling the Americans not to defend themselves). Europeans need to help the US find other solutions to problems posed by proliferation, and to which NMD is seen as a response (with Iran a particularly relevant example). Germany's relationship with Iran was mentioned in this regard, both positive (independent German intelligence on Iran helped publicize Russian-Iranian nuclear cooperation) and negative (the role of German firms in the past in supplying technology to Iran). Another issue of importance is the possible terrorist use of nuclear weapons, and here Europe could do far more to provide funds



NMD System Elements Photo: BMDO, US Department of Defense

with which to soak up excess enriched uranium in Russia.

In the end, the key question is: how would Europe react if it was clearly shown that a country like Iran was engaged in missile and nuclear warhead development? Would it do little or nothing?

Middle East

An overview was presented of the growing missile threat in the region. In addition to Israeli missile and nuclear weapons capabilities, countries acquiring advanced ballistic missiles (and the ability to produce them) include Iran, Egypt, Syria, Libya, and Iraq. Systems such as the Shihab-3 (Iran) and al-Hussein (Iraq) can reach Israel and Turkey, and it is estimated that there will be 2,500 to 3,000 ballistic missiles in the region by the year 2010. The possible emergence of additional nuclear powers in the region in the next 5-7 years is likely to produce a balance of terror in the Middle East that could well increase the likelihood of nuclear pre-emption in a crisis and a nuclear conflict.

It is in this context that theater missile defenses (TMD) are specially relevant, and there was much discussion of the Israeli Arrow system. Some views held that, given Israel's small size and the short warning times involved, Arrow will never be able to provide an effective defense against nuclear-armed ballistic missiles. Indeed, it was posited that, by stimulating a false sense of security, the deployment of Arrow could increase the chance of a nuclear conflict by reducing perceptions of a swift and assured Israeli nuclear response to a nuclear attack. Others

disagreed, saying that, at the least, Arrow would permit Israel to avoid having to rely on launch on warning and launch under attack strategies, particularly as it strengthens its second-strike capability.

Another view is that what is needed is a radical change of opinion in Israel, to the effect that the acquisition of nuclear weapons by others would be a disaster for Israel. Instead of concentrating on Arrow TMD and second strike capability, Israel should work strenuously for the creation of a Middle East free of nuclear weapons as well as chemical and biological weapons.

East Asia

Changes in strategic relations to a post-Cold War environment characterized by asymmetric confrontations, various actors with different objectives, regional rather than ideological disputes, and above all proliferation of weapons of mass destruction, has produced greater interest in ballistic missile defense. If traditional deterrence is indeed eroding, what role could there be for ballistic missile defense, especially in facilitating a transition from mutual assured destruction to mutual assured security?

In the context of East Asia, the US military wants TMD to protect forward-deployed forces, while Taiwan is interested in USN area defenses and Pac2/Pac3. For both these reasons, as well as because of NMD, China is extremely negative. South Korea, for both economic and political reasons, has little current interest in theater missile defenses.

Japan's involvement with missile defenses goes back to SDI collabora-

tion with US in the 1980s, and extends up to work on NTW Block II interceptor (four components). In addition to this being a way of retaining close ties with the US, Japan was primarily motivated by the "defensive nature" of the weapons, to the program's emphasis on R&D and as a way of sustaining Japan's defense technology infrastructure, and by the fact that NMD is a long-term program with potential broad applicability.

There was much sentiment in favor of the proposition that North Korea poses little in the way of a missile threat to the US in the near, or even medium-term. Regionally, reducing offensive military capabilities and developing regional security frameworks could be positive moves.

North Korea

An overview of North Korea emphasized that the Pyongyang regime feels that it is still in a state of war, that the national goal of liberating South Korea remains. This underlies current North Korean policy towards the US, of placating Washington on issues of missile and nuclear technology and thus maneuvering the US out of Korea affairs.

North Korea has gained both economic and political benefits from the export of its missile technology (\$600m a year) to Syria, Iran, Egypt, Libya, Sudan (for Iraq) and Pakistan. Given this "export of instability" to the Middle East, western countries now establishing contacts with Pyongyang have a special responsibility to take action on this issue. In particular, European countries were urged to consult among themselves and develop a common policy, or at least strategy, for pressuring North

Korea on its missile exports.

Recent events were summarized regarding North Korean missile development and attempts to acquire nuclear warheads, the 1998 missile test over Japan, and the attitudes of countries like China and the US. It was emphasized that North Korea achieved with its 1998 missile test what it couldn't through negotiation – high-level recognition by the United States, culminating recently in the visit of Secretary of State Madeleine Albright to Pyongyang. A by-product of this, worrisome to South Koreans, is that North Korea has frozen the reconciliation process with Seoul. Because the road to economic reconstruction runs through Washington, North Korea may well stop the export and testing of ballistic missiles as a means of being taken off the American list of states sponsoring terrorism in order to ultimately gain admission to the World Bank and IMF.

In terms of the military threat it presents, one participant said that North Korean missiles only threaten South Korea (500 short-range Scuds, of 300-500 km). North Korea is using its longer-range missiles as a bargaining chip and presents little in the way of a long-term threat to either Japan or the United States (and in any event is having difficulty with re-entry technology). In that sense, American NMD efforts that posit a North Korean threat are misplaced.

Tactical Nuclear Weapons

From the security perspective of small and medium-sized states, theater nuclear forces are more immediately relevant than the strategic forces that currently dominate the focus of

arms control and missile defense debates. Despite the accomplishment of the unilateral withdrawals of US and Russian theater nuclear forces by Presidents Bush and Gorbachev in 1991, more recent trends are worrisome, including renewed emphasis in Russian military doctrine on TNF to make up for shortfalls in its conventional forces and the development and deployment of Indian and Pakistani nuclear forces. In addition, the existence of large stockpiles of

shells, ADMs, anti-aircraft and anti-missile warheads);

- design and installation of improved permissive action links (PALs) for remaining TNF weapons (gravity bombs, missile warheads);
- greater transparency on current stockpiles and deployment of theater nuclear weapons;
- restrictions on TNF deployment, to a minimum of highly protected centralized storage sites;
- improved physical protection of



NMD Groundbased Radar Photo: BMDO, US Department of Defense

smaller TNF munitions, such as artillery shells and atomic demolition munitions (ADM), which are particularly vulnerable to theft and use by terrorists, should stimulate efforts to eliminate them entirely.

Accordingly, a range of proposed options for dealing with TNF would include:

- codification of the 1991 US and Russian unilateral actions and the verified elimination of several classes of TNF weapons (artillery

warheads (both in storage and in transportation) and separation of warheads and delivery vehicles.

An additional concern is the development of new tactical nuclear weapons, including those with low-yield warheads, that would be viewed as more suitable for actual use in conflict. There is thus an urgent need to conclude agreements prohibiting the development of new types of TNF, while simultaneously working to freeze and ultimately eliminate all

current TNF stockpiles.

There were several calls for the unilateral removal of the remaining American TNF from Europe, as some thought worries about decoupling are anachronistic in the post-Cold War period. Conversely, it was argued that de-nuclearizing NATO Europe could well lead to increased American unilateralism and perceptions of unequal burden sharing.

Conclusions

Is traditional arms control now at a dead end? Should we be thinking of new approaches that can deal with the security and proliferation challenges that give rise to interest in missile defenses in the first place? In the same vein, policies of denial to deal with nuclear proliferation have not worked, they have only slowed the rate at which new countries join the nuclear club. And they are unlikely to work, if a country has the motivation to acquire such weapons. Thus, to what extent do we need to be thinking of positive inducements – such as concrete security guarantees – that could reduce nuclear aspirations?

There is little question that wider counter-proliferation measures are needed, given declining confidence in verification and monitoring measures (Iraq and others), globalizing technologies, the uncertain role of Russia, and “states of concern” who opt out of international norms. Traditional arms control is beneficial for the vast majority of participating states, but doesn’t ensure compliance on the part of outlier states.

While recognizing the need to discuss the future utility of negotiated arms control, opinions were voiced

that it is also important not to prematurely dismiss the future benefits of such efforts. For example, it was proposed that the US-Russian ban on INF systems be expanded worldwide, though in response, it was noted that for smaller countries, INF systems are strategic, not theater, missiles. It was also pointed out that a ban on missiles would make the world safe for manned aircraft and those who excel at them. Opinions were also expressed that more could have been done to strengthen the missile technology control regime.

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On NMD itself, has enough thought been given to constructing a limited NMD for small country threats which wasn’t inherently expandable against Russia and China and thus did not undermine strategic stability and block deep cuts in offensive forces?

Whatever the appropriate mix of diplomatic, security and arms control measures needed to counter the proliferation threat, there was widespread sentiment at the workshop that a far more pro-active policy by European countries, whether individually or in concert, is needed to curtail the aspirations of those countries seeking nuclear and other weapons of mass destruction.

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Participants
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Dr. Gunnar Arbman, Director of Research, Swedish National Defence Research Establishment (FOA), Stockholm, Sweden

Dr. Jeffrey Boutwell, Associate Executive Officer, American Academy of Arts and Sciences, Cambridge, MA, USA

Prof. Francesco Calogero, Professor of Theoretical Physics, University of Rome “La Sapienza”, Rome, Italy; Chairman, Pugwash Council

Prof. Paolo Cotta-Ramusino, Professor of Mathematical Physics, University of Milan, Italy; Secretary General, Union of Italian Scientists for Disarmament (USPID); Director, Program on Disarmament and International Security, Landau Network – Centro Volta, Como, Italy

Ms. Thérèse Delpech, Directeur de la Prospective, CEA, Paris, France

Dr. Ingemar Dörfer, Director of Research, Swedish National Defense Research Establishment (FOA), Stockholm, Sweden; Guest Scholar, CSIS, Washington, D.C.

Amb. Rolf Ekeus, Ministry of Defence, Stockholm, Sweden

Mr. Camille Grand, Lecturer in World Politics and Security Studies, Institut d’études politiques de Paris and Ecole spéciale militaire; Adviser for arms control and non-proliferation, French Ministry of Defence, Paris, France

Dr. Masako Ikegami-Andersson, Senior Lecturer, Center for Pacific Asia Studies, Stockholm University; Research Associate, Foundation for the Advancement of International Sciences, Tsukuba, Japan

Dr. Catherine McArdle Kelleher (USA/Germany), Director, Aspen Institute Berlin, Germany

Dr. George Lewis, Associate Director, Security Studies Program, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA

Working Papers

Mr. Sverre Lodgaard, Director, Norwegian Institute of International Affairs (NUPI), Norway; Member, Pugwash Council

Dr. Götz Neuneck, Senior Fellow, IFSH, Hamburg, Germany

Dr. Sarah Pearce, Physical Sciences and IT Adviser, Parliamentary Office of Science and Technology, London, UK

Dr. Reuven Pedatzur, Lecturer at Tel Aviv University, and Director, Galili Center for Strategy and National Security, Ramat Efal, Israel

Ms. Henriette Rasmussen (Denmark), Advisor, Inuit Circumpolar Conference (ICC), Nuuk, Greenland

Prof. George Rathjens, Secretary-General, Pugwash Conferences on Science and World Affairs; Professor Emeritus, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA

Mr. Ivan Safrantchouk, “Nuclear Arms Control” Project Director, PIR Center for Policy Studies in Russia, Moscow; Member, Executive Council of the Euro-Atlantic Association (Russia)

Mr. Paul Schulte, Director Proliferation and Arms Control, Ministry of Defence, London, UK

Dr. Mark Byung-Moon Suh (Germany/South Korea), Member, Pugwash Council; Senior Researcher, Free University of Berlin, Berlin, Germany; Member, Advisory Council on Democratic & Peaceful Unification of Korea

Mr. Lars Wigg, Project Leader for Studies of Nuclear Weapons and Threat Analysis, Swedish National Defence Research Establishment (FOA), Stockholm, Sweden

Dr. Nicholas Zarimpas (Greece), Research Project Leader, Military Technology and International Security Project, Stockholm International Peace Research Institute (SIPRI), Solna, Sweden

ORGANIZERS / OBSERVERS

Prof. Bengt Gustafsson, Professor of Theoretical Astrophysics, Uppsala University, Sweden; Director, Sigtuna Foundation; Chairman, Swedish Pugwash Group

Mr. Jan Prawitz, Visiting Scholar, Swedish Institute for International Affairs, Stockholm

Mr. Thomas Johansson, Security Policy Analyst, Swedish Armed Forces Headquarters, Stockholm, Sweden, Executive Secretary; Swedish Pugwash Group

Dr. Håkan Nördstrom, Swedish Defence Research Establishment (FOA), Stockholm, Sweden

STAFF

Pugwash Rome Office: **Claudia Vaughn**, Pugwash Conferences

Christina Spolén

Student/Young Sweden Pugwash:
Nicholas Etherden and **Joacim Jonsson**

COMMISSIONED

Therese Delpeche (France): *Convincing the Allies, A Difficult Objective*

Ingemar Dörfer (Sweden): *National Missile Defense: A Swedish View*

George Lewis (USA): *National Missile Defense Options for the Next President*

Sverre Lodgaard (Norway): *If you have a shield, it is easier to use the sword.” European Views of the US NMD Programme (Draft)*

Goetz Neuneck (Germany): *Ballistic Missile Defense, Europe and Germany*

Sarah Pearce (UK): *US National Missile Defense—a UK Perspective*

Henriette Rasmussen (Greenland): *National Missile Defence: Implications for Greenland*

Ivan Safrantchouk (Russia): *Tactical Nuclear Weapons in the Modern World and Russia’s Sub-Strategic Nuclear Forces*

Ivan Safrantchouk (Russia): *Russia’s Approaches to Nuclear Weapons (transparencies)*

PROFFERED

G. Arbman (Sweden), **G. Danielson**, **J. Prawitz (Sweden)**, and **L. Wigg (Sweden)**: *Towards the Elimination of Tactical Nuclear Weapons*

Masako Ikegami-Andersson (Japan): *Theater Missile Defence in East Asia*

Reuven Pedatzur (Israel): *Ballistic Missile Defenses in the Middle East: The Implications on Regional Stability*

Fifty Pugwash Conferences: A Tribute to Eugene Rabinowitch

8 August 2000

Essay

by Sir Joseph Rotblat

Since its inception in 1957 Pugwash has convened a large number of meetings, about 260. More than 80 per cent of these have been symposia, workshops and study groups, but we reserved the name Conference for a special type of activity held once a year. For reasons that will become apparent in the course of my talk, we have had 49 of these annual events in the 43 years of our existence. This meeting in Cambridge, now coming to an end, is the 50th in this sequence, and was thus designated as the Jubilee Conference.

It is customary to use an occasion such as a Jubilee to review the past. The organizers of this Conference have assigned this task to me, presumably because of my unique position: I have attended every one of the 50 Conferences, and I am the *only* person to have accomplished this feat.

It is usual to start a historical review from the beginning, and when I think of the First Pugwash Conference in July 1957, my thoughts turn immediately to a person who played a major role in the early days of Pugwash, but who seems to have been forgotten in the Pugwash of today. I am speaking about Eugene Rabinowitch.

There is a special reason for remembering Eugene just now: the centenary of his birth. The official date of his birth is 1901, but there is some doubt about its accuracy. Under the tsarist regime of that period—he was born in

what was then, and is again now, St. Petersburg—birth certificates were notorious for being incorrect. So, I am using this large gathering of Pugwashites as the occasion to commemorate his centenary. This lecture is my tribute to a great Pugwashite.

I will be talking about Eugene mainly in the context of his involvement in the Pugwash Movement—indeed, I am blending the tribute with the review of the annual Pugwash Conferences—but I want to start with a brief general sketch of his life, and to begin by quoting what I said about him soon after his death in 1973.

Eugene Rabinowitch was a man of many facets: a scientist and a teacher; a classics scholar and a modern philosopher; a poet and a man of letters; a journalist and an editor; a sociologist and a politician. But his main characteristic was simply as a human being, with a warm heart, filled with love and tenderness, not only for his family and friends, but for the whole of mankind. This love for humanity, and his profound belief in the potential of science to ensure a happy life for all, were the guidelines throughout his whole life, the philosophy on which all his activities were based.

The field of his academic research work was biophysics, the application of the principles and methods of physics to biological processes. At that time, this was a new scientific discipline, but has since grown amazingly; it is largely responsible for establishing the basic processes of life, such as the double helix structure of DNA, and for the momentous applications in what is now known as genetic engineering. There were then very few established chairs in biophysics, and the first Chair held by Eugene was that of Botany at the University of Illinois in Urbana. It may sound odd for a physicist to be a Professor of Botany, but there was a good reason for this: Eugene's main interests and his greatest academic achievements were in research on photosynthesis, the process by which green plants

Sir Joseph Rotblat is President Emeritus of the Pugwash Conferences, having served as President from 1988-1997. In 1995 he was awarded the Nobel Peace Prize in recognition of his work, through Pugwash, towards nuclear disarmament. He is Emeritus Professor of Physics at the University of London.



Eugene Rabinowitch Photo courtesy of *Bulletin of Atomic Scientists*

transform the energy of sunlight into chemical energy, a fundamental reaction that maintains life on Earth. Apart from carrying out basic research on photosynthesis, Eugene established a famous School of Photosynthesis and wrote a 3-volume book “Photosynthesis and Related Processes,” which was for many years *the* reference book on the subject.



Sir Joseph Rotblat

It is sad that despite his great contributions to science, he has not received the official accolade due to him: election to membership of the National Academy of Sciences. There are reasons to believe that this omission was a snub by the establishment for his involvement in many social and political activities, including Pugwash.

Involvement in the social and political aspects of science was certainly Eugene’s main preoccupation since the Second World War. He was one of the first to recognize the urgent need and duty of scientists to be concerned about the social consequences of the tremendous advances in science and technology—the Scientific Revolution, as he used to call it. He believed that this revolution called for a correspondingly radical change in the attitude of Man towards social and political problems, especially towards solving disputes: it was vital to resolve conflicts by non-military means if the human species was not to perish in a nuclear holocaust. Eugene not only held strong personal convictions on these issues; he worked hard to convince and convert other scientists to take up this cause.

Eugene’s involvement in the nuclear issue started with the so-called Franck Report, which was submitted to the then Secretary of War, Henry L. Stimson, in June 1945, a

month before the first test of the atom bomb in Alamogordo. The Report was prepared by a committee of scientists working in the Chicago branch of the Manhattan Project. Its two leading members were Eugene Rabinowitch and Leo Szilard: both early opponents of the use of nuclear weapons, but entirely different personalities with different approaches to the problem. The text of the Franck Report—which called for the international control of atomic energy, and appealed to the US government not to use nuclear weapons against civilian populations—was mainly written by Eugene.

When, despite this appeal, the United States used atom bombs to destroy two Japanese cities, a number of scientists on the Manhattan Project decided to do their utmost to ensure that such an act would not be repeated. They set up an organization, now known as the Federation of American Scientists, with the most eminent scientists in the United States among its members. The FAS took explicit stands on a number of political issues and in the early years had considerable success in moulding US policy on matters concerning the utilization of nuclear energy.

I should mention in passing that an organization with similar objectives, but on a much smaller scale, was the Atomic Scientists’ Association in Great Britain, in which I was deeply involved.

Eugene Rabinowitch took an active part in the work of the FAS, but his main influence was exerted through the *Bulletin of the Atomic Scientists*, which he co-founded in 1945, and of which he was Editor-in-Chief from the beginning until the end of his life. Despite its relatively small circulation, the *Bulletin* quickly established itself as a prestigious journal with great influence in the scientific community. In the early days the *Bulletin* had to struggle for existence: the first issue was an 8-page mimeographed sheet. It was really Eugene’s unbounded energy and enthusiasm, and his almost fanatical belief in the importance of the message which the *Bulletin* had to convey, that ensured its survival. He himself wrote more than 100 leading articles; their clarion call, the rousing nature of these articles were the heartbeat of the *Bulletin*.

Thanks to the solid foundations laid down by Rabinowitch, the *Bulletin* continued after his death, under a succession of editors, which included Bernie Feld—another Pugwash stalwart—and Ruth Adams and Mike

Moore, both of whom I am happy to see in the audience. From a mimeographed sheet it grew into a technologically up-to-date publication, dealing with the most pressing problems of the day.

Through both these channels, the FAS and the *Bulletin*, Eugene exerted his influence and conveyed his teaching. His efforts were not confined to the United States: from the beginning he realized that since the problems created by the advances in science and technology affected the whole of mankind, a truly international endeavour was necessary to tackle them. He never missed an opportunity to press for this. Thus, when the first international conference on nuclear physics after the War was convened in Chicago in 1951, he brought together a number of participants and expounded the need to form an international body of scientists. It was at that meeting that I met him for the first time in the flesh. This started a collaboration which developed into a friendship that lasted until his death.

In the Atomic Scientists' Association in England we too were anxious to establish contact with Soviet scientists, but this was impossible under the Stalin regime. It was only after Stalin's death and the beginning of the Khrushchev era that the prospects of a meeting with scientists on the other side of the iron curtain became realistic, and we began preparations for such an event. During several visits of Eugene Rabinowitch to London in 1954 and 1955, he and I worked out an agenda for the international meeting, which at that time was still a dream. But as it turned out, it was the actual agenda for the First Pugwash Conference.

The history of the start of the Pugwash Movement is probably well known to you, but for the sake of continuity I will recall it very briefly. The initiative came from the British philosopher, Bertrand Russell, who suggested to Albert Einstein that a group of eminent scientists should issue a statement drawing attention to the dangerous situation that had arisen from the development and use of nuclear weapons, and the consequent nuclear arms race, and calling on scientists to meet in a conference to assess the danger and seek means to avert it. Russell drew up the text of the statement and Einstein signed it just before he

died in April 1955. After securing the signatures of nine other scientists, nearly all Nobel Laureates, the statement, which became known as the Russell-Einstein Manifesto, was issued to the public in July 1955. An offer to finance the proposed conference was received from Mr. Cyrus Eaton, a US-Canadian industrialist, who requested that it be held in his birthplace, the Nova Scotian village of Pugwash. Thus, in July 1957 we gathered in that village for the First Conference.

The historical significance of that meeting is that it brought together—for the first time—eminent scientists from all over the world, to discuss what in essence were political matters. A very small gathering, 22 in number, the scientists came from 10 countries straddling the political divide: the United States and the Soviet Union; the UK and China; France and Poland; Australia and Austria; Canada and Japan. The spread of scientific disciplines was much narrower, with only one of the 22 not being a natural scientist; about three-quarters of the total were physicists. This meant that the majority knew one another professionally if not personally; they had faith in each other's scientific integrity. This was important, considering that the meeting took place at the height of the Cold War, in a climate of fear, mistrust and hostile propaganda. We built on the confidence we had in one another's scientific integrity

when discussing non-scientific matters.

The agenda for the meeting, the one which Eugene Rabinowitch and I had worked out earlier, consisted of three items:

- Nuclear energy hazards in War and Peace;
- Problems relating to international control of Nuclear Energy;
- Responsibility of Scientists and International Collaboration.

In a general sense these three items have been the Pugwash agenda throughout its history; and can be described briefly as: technical, political and ethical. Under the first item we used our specialized knowledge to assess the consequences of modern warfare, primarily the effects

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**“Scientific and technical
 progress is irreversible. With
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 and universally impossible.”**

—*Russell-Einstein Manifesto*

of nuclear weapons but also of chemical and biological weapons. We are at it still at this 50th Conference, when discussing the likely consequences of the misuse of research on genetic engineering and information technology.

The second topic is the one that has occupied most of our time, in the debates on disarmament and arms control in the nuclear field, or in discussing the terms of conventions banning chemical and biological weapons, as well as a multitude of other issues relating to overcoming war and strife, and securing peace and stability.

The third item refers to Pugwash as a Movement of Scientists. It deals with the social and ethical aspects of science, a problem of increasing importance at a time when the fast advances in some areas of science and technology impinge more and more not only on the material, but also on cultural, moral, and spiritual values of the community. This was the area of special interest to Eugene Rabinowitch.

His main role in Pugwash was to formulate the principles and philosophy of the Movement, and to ensure that they were adapted to changing circumstances. Briefly, his basic philosophy was that the tremendous progress in science and technology has changed the world so much, that the traditional way of life has become obsolete. In particular, the division of the world into a number of sovereign states is outmoded and untenable. Wars have become unthinkable, since they would spell the end of civilization. The survival of mankind, and the advance of its moral and spiritual needs, must be the paramount aim of all people. The aim can be addressed only if we develop a new feeling of community with the whole of mankind. Loyalty to mankind must override all other loyalties. In the creation of the new age, scientists must play a major part, because they understand better the nature of the change; because they are better equipped to educate the general public about the requirements of the new age; and because they can take the first concrete steps towards developing the community of mankind by initiating projects of international collaboration in which scientists from many countries would work together to improve conditions of life.

At the First Conference, Eugene incorporated these ideas in a document, which he drafted and which was adopted by the whole group, under the agenda item on the responsibilities of scientists. The eleven items of common belief include the following:

With the penetration of science into the world of atomic nuclei, humanity has entered a new epoch. Scientific and technical progress is irreversible. With humanity basing much of its technological progress on the manipulation of nuclear forces, it is of paramount importance that war be made permanently and universally impossible.

Science develops most effectively when it is free from interference by any dogma imposed from the outside, and permitted to question all postulates, including her own.

Without the freedom of scientific thought, and the freedom to exchange information and ideas, full utilization of the constructive possibilities of science will not be possible.

Let me end the account of the First Pugwash Conference by linking it with the theme of the 50th Conference. In the public statement from the 1957 Conference we said:

The principal objective of all nations must be the abolition of war and the threat of war hanging over mankind. War must be finally eliminated, not merely regulated by limiting the weapons which may be used.

This echoes the famous phrase from the Russell-Einstein Manifesto: *Shall we put an end to the human race or shall mankind renounce war?*

I hope that our deliberations here in Cambridge will help to ensure that the right answer is given to this rhetorical question.

The First Pugwash Conference ended with the unanimous agreement to continue the effort, by setting up a new organization, "The Pugwash Conferences on Science and World Affairs," a name that we have kept despite the criticism that it is too comical to be taken seriously. This criticism probably refers to the popular children's cartoon character, Captain Pugwash.

The task of organizing further conferences was entrusted to a Continuing Committee of five persons: three from the UK, Lord Russell, Cecil Powell, and myself, one from the Soviet Union, Dmitri Skobeltzyn, and one from the United States, Eugene Rabinowitch.

No guidelines about future activities were given to the Continuing Committee. Before the first meeting of the Committee, Eugene Rabinowitch and I solicited the opinion of scientists in the United States and in Britain by means of a questionnaire. Three possible types of meetings were proposed:

- Type-A—a large meeting to deal with general problems: it would issue resolutions aimed at the world at large.
- Type-B—a smaller meeting to clarify the thinking of scientists themselves and to study the social implications of scientific progress.
- Type-C—a still smaller meeting to discuss immediate political problems; it would be directed primarily at governments.

Although the sample polled was rather small, the response was quite clear. The great majority were in favour, in about equal numbers, of activities of type-B and C. Only a few respondents were in favour of type-A activities.

This was the main point of discussion at the first meeting of the Continuing Committee, which was held in London in December 1957, chaired by Lord Russell. Leo Szilard was also present, and although not a member of the Committee he made his views unmistakably known, namely, his preference for meetings of type-C. On the other hand, Eugene Rabinowitch favoured meetings of type-B. After two days of heated debate we agreed that both types, B and C, should be pursued, though not at the same time. Type-A activities—large public meetings—were not excluded, but to be convened only rarely.

Having decided on general principles we immediately took action on them; namely, holding two conferences in 1958: one of type-C, in March, in Lac Beauport, Canada; the second, of type-B in September, in Kitzbühel, Austria.

The Lac Beauport meeting was run largely on Szilard's lines. Although we never repeated the format, the substance matter—analysis of specific items on nuclear disarmament and arms control—became the model for later symposia and workshops.

In contrast, the Kitzbühel Conference, with an agenda according to the Rabinowitch formula, dealt with a variety of topics. Apart from technological and political aspects of disarmament, it debated the necessity to end war, international co-operation in science, technology in the service of peace, and the responsibility of scientists. It became the model for, what we called later, the annual Pugwash Conferences.

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the adoption of the Vienna Declaration, an expanded version of the eleven items of common belief from the First Pugwash Conference. Although largely forgotten nowadays, it became the tenet of the Pugwash Movement. It was endorsed by thousands of the world scientific community in response to another questionnaire sent out soon afterwards.

It is called the Vienna Declaration, because it was issued to the public in Vienna, where the participants travelled to from Kitzbühel. It was also there, in Vienna, where a meeting of type-A was held. A huge assembly in the Wiener Stadthalle, with an audience of about 10,000. Although several public meetings of type-A were held later, in conjunction with Annual Conferences, we never reached audiences of that size again.

The formula adopted for 1958, to hold two

Conferences, one each of type-B and C, in one year, was repeated for several more years. Thus, in 1961, the Seventh and Eighth Conferences were both held in the United States, in the same place, Stowe, Vermont, in immediate succession. The number of participants was almost the same in both, but the actual composition was considerably different.

The first of these was of type-B, *par excellence*, as is evident from its theme: "International Co-operation in Pure and Applied Science." It reflected Eugene's

strongly held views about the importance of collaboration in science for peace in the world; these were explained extensively in the 14- page document, written by Eugene and endorsed by the whole Conference. Its substantive opening paragraph states:

Science misused by nations to foster their competitive interests as world powers makes possible the destruction of mankind. Science used co-operatively by all nations for the increase of human knowledge and the improvement of man's productive capacity can give all men on earth a satisfactory and worthwhile life. Scientists bear a responsibility both to foster the constructive use of science and to help in preventing its destructive use.

By contrast, the Eighth Conference, under the theme "Disarmament and World Security," concluded with a

statement of only one page, merely listing the topics of discussion.

A similar procedure was adopted in the following year, 1962, at the Conferences held in England; again two in quick succession, although this time in different locations and in reverse order: the Ninth Conference, here in Cambridge, with its theme “Problems of Disarmament and World Security” was of the C-type, while the Tenth Conference; held in London, was of the B-type.

The London Conference, under the theme “Scientists and World Affairs” was of a much larger size, 175 participants, about the same size as the present one. It was the first of the Quinquennial Conferences, which have acquired the role of the general assembly of Pugwash, in the sense that in addition to the usual topics of debate, it also sets the goals of Pugwash for the following five years, and deals with organizational matters, such as the election of a new Pugwash Council, the successor to the Continuing Committee, and officers.

The goals adopted by the London Conference were outlined in the public statement, issued at its conclusion:

We scientists from 36 countries, assembled at the Tenth Pugwash Conference on Science and World Affairs, are united by an awareness that the scientific revolution has created a radically new situation for humanity, endowing man with an unprecedented capacity for creation and destruction....Disarmament and a stable peace are essential conditions for making a new society in which poverty could be abolished. The prospect of such a world is no longer Utopian. ... We reassert our conviction that the goal of full disarmament and permanent peace is realistic and urgent. This work is truly to be seen as a part of a long struggle for the progress of mankind, and it is one in which scientists have a responsible part to play. We call upon scientists everywhere in the world to join us in this task.

The practice of having two conferences in one year, with different emphasis in each, continued for several more years. This explains the discrepancy between the number of Annual Conferences and the number of years of our existence. The practice came to an end at the Second Quinquennial Conference, held in 1967, in Ronneby, Sweden, where it was decided that in the future there would be only one Conference per year. At the same

time, a new type of Pugwash activity was initiated: symposia, of a small size, similar to the size of the earlier C-type Conferences. Thus, after ten years of experimenting, we finally settled on a format of activities which we have followed, more or less, up to the present time. The original type-C activities became the symposia, workshops and study groups. The type-B activities are now the Annual Conferences. In my mind they are largely associated with Eugene Rabinowitch.

I have spent a large proportion of my time on the first ten years of the Pugwash history, for two reasons. First, these were the formative years of Pugwash, and laid the foundations for future activities. Second, because these were the years when Eugene Rabinowitch provided so much of our moral and ethical conceptions. His main endeavour was to ensure that Pugwash was not only a forum for informed debate on ongoing political/ technological problems, but that it also had a mission: to serve as the social conscience of scientists, urging the scientific community to be accountable for the problems that have arisen from the advances of science.

Later this was formulated in the document called “Principles, Structure and Activities of Pugwash,” which serves as the unofficial byelaws to the non-existent constitution of Pugwash. With modification, it is restated at each quinquennial Conference. The current version, adopted three years ago, at the last Quinquennial in Lillehammer, states:

The Pugwash Movement is an expression of the awareness of the social and moral duty of scientists to help to prevent and overcome the actual and potential harmful effects of scientific and technological innovations, and to promote the use of science and technology for the purpose of peace.

In describing Eugene as a staunch advocate of our concern with the social responsibility of scientists, I do not want to create the impression that he was opposed to our involvement in arms control issues. No, he greatly appreciated the importance of the latter, was fully conversant with them, and often made valuable contributions to them, both on the Pugwash forum and in the columns of the *Bulletin*. But he wanted to ensure that *both* aspects figured on our agenda, and that the social responsibility of scientists was not ignored, as the “arms controllers” are prone to do.

During the two decades after the Ronneby Conference, concern with the social responsibility aspect had to take second place to the urgent need to concentrate on halting the nuclear arms race, and preventing the Cold War turning into a hot war. Problems of arms control were discussed not only in symposia and workshops but also in the Working Groups of the annual conferences. The problem of the social responsibilities of scientists usually came up only at the quinquennial conferences.

With the end of the Cold War Pugwash began a systematic study on the desirability and feasibility of a nuclear weapon-free world. Initially, this was the subject of special workshops, but after the results of the study were published in 1995 as a Pugwash monograph, this topic appeared on the agenda of successive annual conferences.

We also began looking into the more distant objective, of creating a world not only without nuclear weapons but without any type of weapon. A war-free world was the theme of the 44th Conference in Greece in 1994, and was—directly or indirectly—the topic of working groups in subsequent annual conferences. It culminated in this, the 50th Conference, which was almost entirely devoted to the elimination of the causes of war.

In recent years we have had very little of the B-type activities, on the social responsibility of scientists. We discussed it in early 1998, at a workshop dedicated to the centenary of Leo Szilard, and it was touched upon here, in Cambridge, in Working Group 6, on the misuse of science. However, much greater interest in the subject was taken by the group in which our hope for the future is invested: the young Pugwashites. SPUSA, the American Student Pugwash Group, is engaged in a campaign on the Pledge—a sort of Hippocratic Oath intended to be taken by young scientists at the start of their careers. The subject of the social responsibility of scientists figures frequently on their agenda, and they have even established an Annual Lecture on this theme.

In my opinion, this subject should also figure more prominently on our agenda, because—in addition to the threat from the existence of nuclear weapons—the rapid advances in several areas of technology may lead to profound societal disturbances, which may arise from the changes in the norms of life of the human community as a result of these advances; changes in economic, cultural and

spiritual values, changes that may be abhorrent to some sections of society. There is a real danger that science and scientists will be blamed for the upheavals. It will be difficult to refute such accusations, unless the scientific community wakes up to its social responsibilities. There is a greater need than ever for Pugwash to take a leading role on these issues; there is a real need to pay heed to the teachings of Eugene Rabinowitch.

Let me conclude this talk with a few words about his philosophy, a philosophy much shared by me. Eugene was aware that to many of the so-called hard-nosed realists, his ideas would appear overtly romantic. In his Presidential Address, at the 20th Annual Conference, in 1970, in Fontana, Illinois, he expressed the hope that society would adapt itself to the new technological habitat. He went on to say:

All this sounds like wishful dreaming—and will be undoubtedly dismissed as such, even by some Pugwash scientists. But yet, it represents the only realistically tenable evaluation of man's existence on Earth in the age of science. Scientists are accustomed to serve common interests of mankind, whatever their national or ideological commitment may be. Science is truly the first common enterprise of mankind. It is proper for scientists to accept responsibility for weaving this thread into the fabric of human society. What was once valid for a single society—united we stand, divided we fall—is becoming true of mankind as a whole.”

Is all this Utopian, a pipe dream? If it were so then we are surely doomed, for there would be no escaping a nuclear holocaust. I would rather share Eugene's beliefs, a blend of idealism and realism. For he was a giant of a man: his head was often in the clouds, but his feet were firmly planted on the ground.

Despite his inherent optimism, occasionally he would become disheartened with the lack of progress towards a safer world. These misgivings and doubts about his capability to influence events he expressed in poems; he usually wrote in Russian, his mother tongue. But these doubts were only passing moods. His own extremely active life until the very end bears witness to his fighting spirit, to his impatience with compromise and defeatism; to his unswerving determination to tackle the job ahead, notwithstanding the difficulties. If he had one criticism

of Pugwash it was the timidity and caution of many participants.

As a poet himself, Eugene was familiar with the poetry of many countries, including Poland, where he spent some time in his younger days. His favourite quotation was from the most famous of Polish poets of the 19th century, Adam Mickiewicz. As it happened, this was also my favourite quotation, and the fact that we had this in common cemented our friendship. I want to quote it in my native language; which at least a few here will understand: *Mierz sile na zamiary, nie zamiar podlug sil.*

This short verse contains the essence of our life philosophies. An approximate English translation reads:

Fashion resources to the aims; not aims to the resources.

This has been my guiding principle since the days of my youth. It still is, in my twilight. Together with Eugene Rabinowitch, I would like to see it adopted by Pugwashites.

Our aim is to ensure that science is used for the benefit of mankind; that it will help to build an equitable, peaceful world; a world without war. This 50th Pugwash Conference was dedicated to this aim. Many will say that this aim is unrealistic; but what is the alternative? We have to keep our target clearly in our sights, and marshal our resources towards it, not just because it is the only choice, but because it is the right choice.

PLENARY ADDRESS

India and the Bomb

Essay

by Amartya Sen

[The following article by Amartya Sen is adapted from his Dorothy Hodgkin Memorial Lecture given at the 50th Pugwash Conference, which appeared in *The New Republic* on 25 September 2000 and *Frontline (India)* on 29 September 2000. Amartya Sen is the Master of Trinity College, Cambridge, and the Lamont University Professor Emeritus at Harvard University.]

Weapons of mass destruction have a peculiar fascination. They can generate a warm glow of strength and power carefully divorced from the brutality and genocide on which the potency of the weapons depends. The great epics—from *Iliad* and *Ramayana* to *Kalevala* and *Nibelungenlied*—provide thrilling accounts of the might of special weapons, which not only are powerful in themselves, but also greatly empower their possessors. As India, along with Pakistan, goes down the route of cultivating nuclear weapons, the imagined radiance of perceived power is hard to miss.

The Moral and the Prudential

Perceptions can deceive. It has to be asked whether powerful weapons in general and nuclear armaments in particu-

lar can be expected—invariably or even typically—to strengthen and empower their possessor. An important prudential issue is involved here. There is, of course, also the question of ethics, and in particular the rightness or wrongness of a nuclear policy. That important issue can be distinguished from the question of practical benefit or loss of a nation from a particular policy. We have good grounds to be interested in both the questions—the prudential and the ethical—but also reason enough not to see the two issues as disparate and totally delinked from each other. Our behaviour towards each other cannot be divorced from what we make of the ethics of one another's pursuits, and the reasons of morality have, as a result, prudential importance as well. It is in this light that I want to examine the challenges of nuclear policy in the subcontinent in general and in India in particular.

Whether, or to what extent, powerful weapons empower a nation is not a new question. Indeed, well before the age of nuclear armament began, Rabindranath Tagore had expressed a general doubt about the fortifying effects of military strength, If “in his eagerness for power,” Tagore had argued in 1917, a nation “multiplies his weapons at the cost of his soul, then it is he who is in much greater danger than his enemies.” Tagore was not as uncompro-

misguidedly a pacifist as Mahatma Gandhi was, and his warning against the dangers of alleged strength through more and bigger weapons related to the need for ethically scrutinizing the functions of these weapons and the exact uses to which they are to be put as well as the practical importance of the reactions and counteractions of others. The “soul” to which Tagore referred includes, as he explained, the need for humanity and understanding in international relations.

Tagore was not merely making a moral point, but also one of pragmatic importance, taking into account the responses from others that would be generated by one’s pursuit of military might. His immediate concern in the quoted statement was with Japan’s move towards extensive nationalism. Tagore was a great admirer of Japan and the Japanese, but felt very disturbed by its shift from economic and social development to aggressive militarization. The heavy sacrifices that were forced on Japan later on, through military defeat and nuclear devastation, Tagore did not live to see (he died in 1941), but they would have only added to Tagore’s intense sorrow. But the conundrum that he invoked, about the weakening effects of military power, has remained active in the writings of contemporary Japanese writers, perhaps mostly notably Kenzaburo Oe.

Science, Politics and Nationalism

The leading architect of India’s ballistic missile programme and a key figure in the development of nuclear weapons is Dr. Abdul Kalam. He comes from a Muslim family, is a scientist of great distinction, and has a very strong commitment to Indian nationalism. Abdul Kalam is also a very amiable person (as I had discovered when I had been closeted with him at an honorary degree ceremony at Jadavpur University in Calcutta in 1990, many years before the blasts). Kalam’s philanthropic concerns are strong, and he has a record of helping in welfare-related causes, such as charitable work for mentally impaired children in India.

Kalam recorded his proud reaction as he watched the Indian nuclear explosions in Pokhran, on the edge of the Thar desert in Rajasthan, in May 1998: “I heard the earth thundering below our feet and rising ahead of us in terror. It was a beautiful sight.” It is rather remarkable that the

admiration for sheer power should be so strong in the reactions of even such a kind-hearted person, but perhaps the force of nationalism played a role here, along with the general fascination that powerful weapons seem to generate. The intensity of Kalam’s nationalism may be well concealed by the mildness of his manners, but it was evident enough in his statements after the blasts (“for 2,500 years India has never invaded anybody”), no less than his joy at India’s achievement (“a triumph of Indian science and technology”).

This was, in fact, the second round of nuclear explosions in the same site, in Pokhran; the first was under Indira Gandhi’s Prime Ministership in 1974. But at that time the whole event was kept under a shroud of secrecy, partly in line with the Government’s ambiguity about the correct-

ness of the nuclear weaponization of India. While China’s nuclearization clearly had a strong influence in the decision of the Gandhi government to develop its own nuclear potential (between 1964 and 1974 China had conducted 15 nuclear explosions), the official government position was that the 1974 explosion in Pokhran was strictly for “peaceful purposes,” and that India remained committed to doing without nuclear weapons. The first

Pokhran tests were, thus, followed by numerous affirmations of India’s rejection of the nuclear path, rather than any explicit savouring of the destructive power of nuclear energy.

It was very different in the summer of 1998 following the events that have come to be called Pokhran-II. By then there was strong support from various quarters. This included, of course, the Bharatiya Janata Party (or the BJP), which had included the development of nuclear weapons in its electoral manifesto, and led the political coalition that came to office after the February elections in 1998. While previous Indian governments had considered following up the 1974 blast by new ones, they had stopped short of doing it, but with the new—more intensely nationalist—government the lid was lifted, and the blasts of Pokhran-II occurred within three months of its coming to power. The BJP, which has built up its base in recent years by capturing and to a great extent fanning Hindu nationalism, received in the elections only a minority of Hindu votes, and *a fortiori* a minority of total votes

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below our feet and rising ahead
of us in terror. It was a
beautiful sight.”**
—Abdul Kalam on the Indian
nuclear explosions in Pokhran
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in the multireligious country. (India has nearly as many Muslims as Pakistan and many more Muslims than Bangladesh, and also of course Sikhs, Christians, Jains, Parsees, and other communities.) But even with a minority of parliamentary seats (182 out of 545), BJP could head an alliance—a fairly *ad hoc* alliance—of many different political factions, varying from strictly regional parties (such as AIADMK, PMK and MDMK of Tamil Nadu, Haryana Lok Dal and Haryana Vikas Party of Haryana, Biju Janata Dal of Orissa, West Bengal Trinamool Congress of West Bengal) to specific community-based parties (including the Akali Dal, the party of Sikh nationalism), and some breakaway factions of other parties. As the largest group within the coalition, the BJP was the dominant force in the 1998 Indian government (as it is in the present coalition government since the new elections that had to be called in late 1999), which gives it much more authority than a minority party could otherwise expect to get in Indian politics.

BJP's interest in following up the 1974 blast by further tests and by actually developing nuclear weapons received strong support from an active pro-nuclear lobby, which includes many Indian scientists. The advocacy by scientists and defence experts was quite important in making the idea of a nuclear India at least plausible to many, if not quite fully acceptable yet as a part of a reflective equilibrium of Indian thinking. As Praful Bidwai and Achin Vanaik put it in their well-researched and well-argued book, "The most ardent advocates of nuclear weapons have constantly sought to invest these weapons with a religious-like authority and importance—to emphasize the awe and wonder rather than the revulsion and horror—to give them an accepted and respectable place in the mass popular culture of our times."

The Thrill of Power

Kalam's excitement at the power of nuclear explosions was not, of course, unusual as a reaction to the might of weapons. The excitement generated by destructive power, dissociated from any hint of potential genocide, has been a well-observed psychological state in the history of the world. Even the normally unruffled J. Robert Oppenheimer, the principal architect of the world's first nuclear explosion, was moved to quote the two-millennia old *Bhagavad Gita* (Oppenheimer knew Sanskrit well enough to get his

Gita right) as he watched the atmospheric explosion of the first atom bomb in a U.S. desert near the village of Oscuro on 16 July 1945: "the radiance of a thousand suns....burst into the sky."

Oppenheimer went on to quote further from *Bhagavad Gita*: "I am become Death, the shatterer of worlds." That image of death would show its naked and ruthless face next month in Hiroshima and Nagasaki (what Kenzaburo Oe has called "the most terrifying monster lurking in the darkness of Hiroshima"). As the consequences of nuclearization became clearer to Oppenheimer, he went on to campaign against nuclear arms, and with special fervour against the Hydrogen bomb. But in July 1945, in the experimental station in the U.S. desert, "Jornala del Muerto" (translatable as "Death Tract"), there was only sanitized abstractness firmly detached from any actual killing.

The thousand suns have now come home to the subcontinent to roost. The five Indian nuclear explosions in Pokhran on 11 and 13 May 1998 were quickly followed by six Pakistani blasts in the Chagai hills the following month. "The whole mountain turned white," was Pakistan Government's charmed response. The subcontinent was by now caught in an overt nuclear confrontation, masquerading as further empowerment of each country.

These developments have received fairly uniform condemnation abroad, but also considerable favour inside India and Pakistan, though we must be careful not to exaggerate the actual extent of domestic support. Pankaj Mishra did have reason enough to conclude, two weeks after the blasts, that "the nuclear tests have been extremely popular, particularly among the urban middle class." But that was too soon to see the long-run effects on Indian public opinion. Furthermore, the enthusiasm of the celebrators is more easily pictured on the television than the deep doubts of the sceptics. Indeed, the euphoria that the television pictures captured on the Indian streets immediately following the blasts concentrated on the reaction of those who did celebrate and chose to come out and rejoice. It was accompanied by doubts and reproach of a great many people who took no part in the festivities, who did not figure in the early television pictures, and whose doubts and opposition found increasingly vocal expression over time. As Amitav Ghosh, the novelist, noted in his extensive review of Indian public reactions to the bomb for *The*

New Yorker, “the tests have divided the country more deeply than ever.”

It is also clear that the main political party that chose to escalate India’s nuclear adventure, namely BJP, did not get any substantial electoral benefit from the Pokhran blasts. In fact quite the contrary, as the analyses of local voting since the 1998 blasts tend to show. By the time India went to polls again, in September 1999, the BJP had learned the lesson sufficiently to barely mention the nuclear tests in their campaign with the voters. And yet, as N. Ram (the political commentator and the Editor of *Frontline*) has cogently argued in his anti-nuclear book *Riding the Nuclear Tiger*, we “must not make the mistake of assuming that since the Hindu Right has done badly out of Pokhran-II, the issue has been decisively won.”

Indian attitudes towards nuclear weaponization are characterized not only by ambiguity and moral doubts, but also by some uncertainty as to what is involved in making gainful use of these weapons. It may be the case, as several opinion polls have indicated, that public opinion in India has a much smaller inclination, compared with Pakistani public opinion, to assume that nuclear weapons will ever be actually used in a subcontinental war. But since the effectiveness of these weapons depends ultimately on the willingness to use them in some situations, there is an issue of coherence of thought that has to be addressed here. Implicitly or explicitly an eventuality of actual use has to be among the possible scenarios that must be contemplated, if some benefit is to be obtained from the possession and deployment of nuclear weapons. To hold the belief that nuclear weapons are useful but must never be used lacks cogency and can indeed be seen to be a result of the odd phenomenon that Arundhati Roy (the author of the wonderful novel *The God of Small Things*) has called “the end of imagination.”

As Roy has also brought out with much clarity, the nature and results of an actual all-out nuclear war are almost impossible to imagine in a really informed way. Arundhati Roy describes a likely scenario thus:

Our cities and forests, our fields and villages will burn for days. Rivers will turn to poison. The air will become fire. The wind will spread the flames. When everything there is to burn has burned and the fires die, smoke will rise and shut out the sun.

It is hard to think that the possibility of such an even-

tuality can be a part of a wise policy of national self-defence.

Established Nuclear Powers and Subcontinental Grumbles

One of the problems in getting things right arises from a perceived sense of inadequacy, prevalent in India, of any alternative policy that would be entirely satisfactory and would thus help to firm up a rejection of nuclear weapons through the transparent virtues of a resolutely non-nuclear path (as opposed to the horrors of the nuclear route). This is perhaps where the gap in perceptions is strongest between the discontent and disgust with which the subcontinental nuclear adventures are viewed in the West and the ambiguity that exists on this subject within India (not to mention the support of the nuclear route that comes from the Government, the BJP, and India’s pro-nuclear lobby). It is difficult to understand what is going on in the subcontinent without placing it solidly in a global context.

Nuclear strategists in South Asia tend to resent deeply the international condemnation of Indian and Pakistani policies and decisions that does not take note of the nuclear situation in the world as a whole. They are surely justified in this resentment, and also right to question the censoriousness of Western critics of subcontinental nuclear adventures without adequately examining the ethics of their own nuclear policies, including preservation of an established and deeply unequal nuclear hegemony, with very little attempt to achieve global denuclearization. The Defence Minister of India, George Fernandes, told Amitav Ghosh: “Why should the five nations that have nuclear weapons tell us how to behave and what weapons we should have?” This was matched by the remark of Qazi Hussain Ahmed, the leader of Jamaat-e-Islami (Pakistan’s principal religious party), to Ghosh: “...we don’t accept that five nations should have nuclear weapons and others shouldn’t. We say, “Let the five also disarm.”

The inquiry into the global context is indeed justified, but what we have to examine is whether the placing of the subcontinental substory within a general frame of a bigger global story really changes the assessment that we can reasonably make of what is going on in India and Pakistan. In particular, to argue that their nuclear policies are deeply mistaken does not require us to dismiss the widespread

resentment in the subcontinent of the smugness of the dominant global order. These complaints, even if entirely justified and extremely momentous, do not establish the sagacity of a nuclear policy that dramatically increases uncertainties within the subcontinent without achieving anything to make each country more secure. Indeed, Bangladesh is probably now the safest country to live in, in the subcontinent.

Moral Resentment and Prudential Blunder

There are, I think, two distinct issues, which need to be carefully separated. First, the world nuclear order is extremely unbalanced and there are excellent reasons to complain about the military policies of the major powers, particularly the five that have a monopoly over official nuclear status as well as over permanent membership in the Security Council of the United Nations. The second issue concerns the choices that other countries—*other* than the big five—face, and this has to be properly scrutinized, rather than being hijacked by resentment of the oligopoly of the power to terrorize. The fact that other countries, including India and Pakistan, have ground enough for grumbling about the nature of the world order, sponsored and supported by the established nuclear powers without any serious commitment to denuclearization, does not give them any reason to pursue a nuclear policy that worsens their own security and adds to the possibility of a dreadful holocaust. Moral resentment cannot justify a prudential blunder.

I have so far not commented on the economic and social costs of nuclearization and the general problem of allocation of resources. That issue is, of course, important, even though it is hard to find out exactly what the costs of the nuclear programmes are. The expenses on this are carefully hidden in both the countries. Even though it is perhaps easier to estimate the necessary information in India (given a greater need for disclosure in the Indian polity), the estimates are bound to be quite rough.

Recently, C. Rammanohar Reddy, a distinguished journalist at the major daily called *The Hindu*, has estimated that the cost of nuclearization is something around half a percentage of the gross domestic product per year. This might not sound like much, but it is large enough if we consider the alternative uses of these resources. For example, it has been estimated that the

additional costs of providing elementary education for every child with neighbourhood schools at every location in the country would cost roughly the same amount of money. The proportion of illiteracy in Indian adult population is still about 40 per cent, and it is about 55 per cent in Pakistan. Furthermore, there are other costs and losses as well, such as the deflection of India's scientific talents to military-related research away from more productive lines of research and also from actual economic production. The prevalence of secretive military activities also restrains open discussions in the parliament and tends to subvert traditions of democracy and free speech.

However, ultimately the argument against nuclearization is not primarily an economic one. It is rather the increased insecurity of human lives that constitutes the biggest penalty of the subcontinental nuclear adventures. That issue needs further scrutiny.

Does Nuclear Deterrence Work?

What of the argument that nuclear deterrence makes war between India and Pakistan less likely? Why would not the allegedly proven ability of nuclear balance, which is supposed to have kept peace in the world, be effective also in the subcontinent? I believe that this question can be answered from four different perspectives.

First, even if it were the case that the nuclearization of India and Pakistan reduces the probability of war between the two, there would be a trade off here between a lower chance of conventional war against some chance of a nuclear holocaust. No sensible decision making can concentrate only on the probability of war without taking note of the size of the penalties of war should it occur. Indeed, any significant probability of the scenario captured by Arundhati Roy's description of "the end of imagination" can hardly fail to outweigh the greater probability, if any, of the comparatively milder penalties of conventional war.

Second, there is nothing to indicate that the likelihood of conventional war is, in fact, reduced by the nuclearization of India and Pakistan. Indeed, hot on the heels of the nuclear blasts, the two countries did undergo a major military confrontation in the Kargil district in Kashmir. The Kargil conflict, which occurred within a year of the nuclear blasts of India and Pakistan, was in fact the first military conflict between the two in nearly thirty years.

Many Indian commentators have argued that the confrontation, which was provoked by separatist guerrillas coming across the line of control from Pakistan (in their view, joined by army regulars), was helped by Pakistan's understanding that India would not be able to use its massive superiority in conventional forces to launch a bigger war in retaliation, precisely because it would fear a nuclear holocaust. Whether or not this analysis is right, there is clearly substance in the general reasoning that the enemy's fear of nuclear annihilation can be an argument in favour of military adventurism without expectation of a fuller retaliation from the enemy. Be that as it may, the proof of the pudding is in the eating, and no matter what the explanation, nuclearization evidently has not prevented non-nuclear conflicts between India and Pakistan.

Third, the danger of accidental nuclear war is much greater in the subcontinent than it was in the cold war itself. This is not only because the checks and controls are much looser, but also because the distances involved are so small between India and Pakistan that there is little time for any conversation when a crisis might occur and a first strike were feared. Also, the much discussed hold of fundamentalist jihadists within the Pakistan military and the absence of democratic control add to the fear of a sudden flash point.

Fourth, there is a need also to assess whether the peace that the world enjoyed with nuclear deterrence during the global cold war was, in fact, predictable and causally robust. The argument for the balance of terror has been clear enough for a long time, and was most eloquently put by Winston Churchill in his last speech to the House of Commons on the 1st of March 1955. His ringing words on this ("safety will be the sturdy child of terror, and survival the twin brother of annihilation") has a mesmerizing effect, but Churchill himself did make exceptions to his rule, when he said that the logic of deterrence "does not cover the case of lunatics or dictators in the mood of Hitler when he found himself in his final dug-out."

Dictators are not unknown in the world (even in the subcontinent), and at least part-lunatics can be found with some frequency in both the countries, judging by what some eloquent commentators seem to be able to write on the nuclear issue itself. But perhaps more importantly, we have reason to note that risks have been taken also by peo-

ple with impeccable credentials on sanity and lucidity. To give just one example (a rather prominent one), in choosing the path of confrontation in what has come to be called the Cuban Missile Crisis, President Kennedy evidently took some significant risks of annihilation on behalf of humanity. Indeed, Theodore C. Sorenson, Special Counsel to President Kennedy, put the facts thus (in a generally admiring passage):

John Kennedy never lost sight of what either war or surrender would do to the whole human race. His UN Mission was preparing for a negotiated peace and his Joint Chiefs of Staff were preparing for war, and he intended to keep both on rein....He could not afford to be hasty or hesitant, reckless or afraid. The odds that the Soviets would go all the way to war, he later said, seemed to him then "somewhere between one out of three and even."

Well, a chance of annihilation between one-third and one-half is not an easy decision to be taken on behalf of the human race.

I think we have to recognize that the peace of nuclear confrontation in the cold war partly resulted from luck, and may not have been preordained. To take *post hoc* to be *propter hoc* is a luxury that can be quite costly for charting out future policies in nuclear—or indeed any other—field. We have to take account not only of the fact that circumstances are rather different in the subcontinent compared with what obtained during the nuclear confrontation in the global cold war, but also the world was actually rather fortunate to escape annihilation even in the cold war itself. And the dangers of extermination did not come only from lunatics or dictators.

So, to conclude this section, the nuclearization of the subcontinental confrontations need not reduce the risk of war (either in theory or in practice), and it escalates the penalty of war in a dramatic way. The unjust nature of world military balance does not change this crucial prudential recognition.

Were the Indian Government's Goals Well Served?

I come now to a question of rather limited interest, but which is asked often enough, addressed particularly to India. Even if it is accepted that the subcontinent is less secure as a result of the tit-for-tat nuclear tests, it could be the case that India's own self-interest has been well served

by the BJP-led government's nuclear policy. India has reason to grumble, it is argued, for not being taken as seriously as one of the largest countries in the world should be. There is unhappiness also in the attempt by some countries, certainly the United States in the past, to achieve some kind of a "balance" between India and Pakistan, whereas India is nearly seven times as large as Pakistan and must not be taken to be at par with it. Rather the comparison should be with China, and for this—along with other causes such as getting India a permanent seat in the Security Council—India's nuclear might could be expected to make a contribution. The subcontinent may be less secure as a result of the nuclear developments, but, it is argued, India did get some benefit. How sound is this line of argument?

I have some difficulty in pursuing this exercise. Even though I am citizen of India, I don't really think I can legitimately inquire only into the advantages that India alone may have received from a certain policy, excluding the interests of others whose interests were also affected. However, it is possible to scrutinize the effects of a certain policy in terms of the given goals of the Indian government (including strategic advantages over Pakistan as well as enhancement of India's international standing), and ask the rather coldly "scientific" question whether those goals have been well served by India's recent nuclear policy. We do not have to endorse these goals to examine whether they have actually been better promoted.

There are good reasons to doubt that these goals have indeed been better served by the sequence of events at Pokhran and Chagai. First, India had—and has—massive superiority over Pakistan in conventional military strength. That strategic advantage has become far less significant as a result of the new nuclear balance. Indeed, since Pakistan has explicitly refused to accept a "no first use" agreement, India's ability to count on conventional superiority is now, to a great extent, less effective (along with increasing the level of insecurity in both countries). In the Kargil confrontation, India could not even make use of its ability to cross into the Pakistani administered Kashmir to attack the intruders from the rear, which military tacticians seem to think would have made much more sense

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The fact that India can make nuclear weapons was well established before the present tit-for-tat nuclear tests were conducted.

than trying to encounter the intruders by climbing steeply up a high mountain from the Indian side to battle the occupants at the top. This not only made the Indian response less effective and rapid, it also led to more loss of Indian soldiers (1300 lives according to Government of India's estimate and 1750 according to Pakistan's estimate) and added greatly to the expenses of the war conducted from an unfavoured position (\$2.5 billion in direct expenses). With the danger of a nuclear outburst, the Indian Government's decision not to countercross the line of control in retaliation was clearly right, but it had no real option in this respect, given the strategic bind which it had itself helped to create.

Second, the fact that India can make nuclear weapons was well established before the present tit-for-tat nuclear tests were conducted. Pokhran-I in 1974 had already established the point, even though the Indian official statements tried to play down the military uses of that blast a quarter of a century ago. After the recent set of tests, India's and Pakistan's positions seem to be much more even, at least in international public perception. As it happens, Pakistan was quite modest in its response. I remember thinking in the middle of May 1998, following the Indian tests, that surely Pakistan would now blast a larger number of bombs than India's five. I was agreeably impressed by Pakistan's moderation in blasting only six, which is the smallest whole number larger than five. The Government of India may deeply dislike any perception of parity with Pakistan, but did its best, in effect, to alter a situation of acknowledged asymmetry into one of perceived parity.

Third, aside from perceptions, in terms of the scientific requirement for testing, Pakistan clearly had a greater case for testing, never having conducted a nuclear test before 1998. This contrasted with India's experience of Pokhran-I in 1974. Also, with a much smaller community of nuclear scientists and a less extensive development of the possibilities of computerized simulation, the scientific need for an actual test may be much greater in Pakistan than in India. While Pakistan was concerned about the condemnation of the world community by testing on its own, the Indian blasts in May 1998 created a situation in

which Pakistan could go in that direction without being blamed for starting any nuclear adventure. Eric Arnett puts the issue thus:

In contrast to its Indian counterparts, Pakistan's political elite is less abashed about the need for nuclear deterrence. Military fears that the Pakistani nuclear capability was not taken seriously in India combined with a feeling of growing military inferiority after being abandoned by the USA after the cold war create an imperative to test that was resisted before May 1998 only because of the threat of sanctions. The Indian tests created a situation in which the Pakistani leadership saw an even greater need to test and a possible opening to justify the test as a response that was both politically and strategically understandable.

The thesis, often articulated by India's pro-nuclear lobby, that India was in a greater danger of a first strike from Pakistan *before* the summer of 1998 lacks scientific as well as political credibility.

Fourth, nor was there much success in getting recognition for India as being in the same league as China, or for its grumble that inadequate attention is internationally paid to the dangers India is supposed to face from China. Spokesmen of the Indian government were vocal on these issues. A week before the Pokhran tests in 1998, Indian Defence Minister George Fernandes said in a much quoted television interview, "China is potential threat number one....The potential threat from China is greater than that from Pakistan." In between the tests on May 11 and May 13, the Indian Prime Minister Vajpayee wrote to President Clinton to point to China as being related to the motivation for the tests. This letter, which was published in *The New York Times* (after being leaked) on May 13, did not name China, but referred to it in very explicit terms:

We have an overt nuclear weapon state on our borders, a state which committed armed aggression against India in 1962. Although our relations with that country have improved in the last decade or so, an atmosphere of distrust persists mainly due to the unresolved border problem. To add to the distrust that country has materially helped another neighbour of ours to become a covert nuclear weapons state.

However, as a result of the tit-for-tat nuclear tests by India and Pakistan, China could stand well above India's

little grumbles, gently admonishing it for its criticism of China, and placing itself in the position of being a subcontinental peace-maker. When President Clinton visited China in June 1998, China and the United States released a joint statement declaring that the two countries would cooperate in non-proliferation efforts in the subcontinent.

Mark Frazier's assessment of the gap between Government of India's attempts and its achievement in this field captures the essence of this policy failure.

Had it been India's intention to alert the world to its security concerns about China as a dangerous rising power, the tests managed to do just the opposite—they gave the Chinese officials the opportunity to present China as a cooperative member of the international community seeking to curb nuclear weapons proliferation. Far from looking like a revisionist state, China played the role of a status quo power, and a rather assertive one at that.

Fifth, nor did the blasts advance the cause of India's putative elevation to a permanent membership of the Security Council. If a country could blast its way into the Security Council, this would give an incentive to other countries to do the same. Furthermore, the new parity established between India and Pakistan after Pokhran-II and Chagai Hills also militates against the plausibility of that route to permanency in the Security Council, and this too could have been well predicted. I personally don't see why it is so important for India to be permanently on the Security Council (it may be in the interest of others for this to happen, given India's size and growing economic strength, but that is a different issue altogether). However, for the Government of India which clearly attaches importance to this possibility, it would surely have been wiser to emphasize its restraint in not developing nuclear weapons despite its proven ability to do so since 1974, and also use the pre-1998 asymmetry with Pakistan, in contrast with the symmetry that developed—following Indian Government's own initiative—after Pokhran-II and Chagai.

One of the interesting side lights that emerge from a scrutiny of Indian official perceptions is the extent to which the Government underestimates India's importance as a major country, a democratic polity, a rich multireligious civilization, with a well-established tradition in science and technology (including the cutting edge of information technology), and with a fast-growing economy

that could grow, with a little effort, even faster. The over-estimation of the persuasive power of the bomb goes with an underestimation of the political, cultural, scientific and economic strengths of the country. There may be pleasure in the official circles at the success of President Clinton's visit to India and the asymmetrically favoured treatment it got in that visit vis-a-vis Pakistan, but the tendency to attribute that asymmetry to Indian nuclear adventure, rather than to India's large size, democratic politics, and its growing economy and technology is difficult to understand.

On Separating the Issues

To conclude, it is extremely important to distinguish the two distinct problems, both of which have a bearing on subcontinental nuclear policies. First, the world order on weapons needs a change and in particular requires an effective and rapid disarmament, particularly in nuclear arsenals. Second, the nuclear adventures of India and Pakistan cannot be justified on the ground of the unjustness of the world order, since the people whose lives are made insecure as a result of these adventures are primarily the residents of the subcontinent themselves. Resenting the obtuseness of others is not a good ground for shooting oneself in the foot.

This does not, of course, imply that India or Pakistan has reason to feel happy about the international balance of power that the world establishment seems keen on maintaining, with or without further developments, such as an attempted "nuclear shield" for the United States. Indeed, it must also be said that there is an inadequate appreciation in the West of the extent to which the role of the big five arouses suspicion and resentment in the third world, including the subcontinent. This applies not only to the monopoly over nuclear armament, but also, on the other side, to the "pushing" of conventional, non-nuclear armaments in the world market for weapons.

For example, as the *Human Development Report 1994*, prepared under the leadership of that visionary Pakistani economist Mahbub ul Haq, pointed out, not only were the top five arms-exporting countries in the world precisely the five permanent members of the Security Council of the United Nations, but also they were, together, responsible for 86 per cent of all the conventional weapons exported during 1988-92. Not surprisingly the Security Council has not been able to take any

serious initiative that would really restrain the merchants of death. It is not hard to understand the scepticism in India and Pakistan—and elsewhere—about the responsibility and leadership of the established nuclear powers.

As far as India is concerned, the two policies—of nuclear abstinence *and* demanding a change of world order—can be pursued simultaneously. Nuclear restraint strengthens rather than weakens India's voice. To demand that the Comprehensive Test Ban Treaty be redefined to include a dated programme of denuclearization may well be among the discussable alternatives. But making nuclear bombs, not to mention deploying them, and spending scarce resource on missiles and what is euphemistically called "delivery," can hardly be seen as sensible policy. The claim that subcontinental nuclearization would somehow help to bring about world nuclear disarmament is a wild dream that can only precede a nightmare. The moral folly in these policies are substantial, but what is also clear and decisive is the prudential mistake that has been committed. The moral and the prudential are, in fact, rather close in a world of interrelated interactions, for reasons that Rabindranath Tagore had discussed nearly a hundred years ago.

Finally, on a more specific point, no country has as much stake as India in having a prosperous and civilian democracy in Pakistan. Even though the Nawaz Sharif government was clearly corrupt in many ways, India's interests are not well served by the undermining of civilian rule in Pakistan, to be replaced by activist military leaders. Also, the encouragement of across-border terrorism, which India accuses Pakistan of, is likely to be dampened rather than encouraged by Pakistan's economic prosperity and civilian politics. It is particularly important in this context to point to the dangerousness of the argument, often heard in India, that the burden of public expenditure would be more unbearable for Pakistan, given its smaller size and relatively stagnant economy, than it is for India. This may well be the case, but the penalty that can visit India from an impoverished and desperate Pakistan, in the present situation of massive insecurity, can be quite catastrophic. Strengthening of Pakistan's stability and enhancement of its well-being have prudential importance for India, in addition to their obvious ethical significance. That central connection—between the moral and the prudential—must be urgently grasped

*Eliminating the Causes of War***Essay***by David A. Hamburg*

I am deeply honored to be a part of this landmark, 50th Conference of Pugwash. I am especially delighted to be invited by my long-standing and highly valued friend Robert Hinde, one of the great scientists of our time and a major contributor to our understanding of war and peace; and to be introduced by Joseph Rotblat, a truly inspired leader of the scientific community in our quest for just peace.

A superb example of international scientific cooperation during the Cold War was the Pugwash Conferences on Science and World Affairs, recognized in 1995 by the Nobel Peace Prize. Stemming from the initial meeting in 1957 was a continuing series of informal discussions among the world's scientists and the availability of resulting recommendations to governments. Pugwash surely played a valuable role in facilitating the negotiation of the Nuclear Test Ban Treaty, the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological and Toxin Weapons and on their Destruction; and the Anti Ballistic Missile Agreement. I was personally involved in one of Pugwash's lesser known but nevertheless fascinating accomplishments. I will return to that later.

Within only a moment of evolutionary time, human ingenuity has produced a huge increase in destructive power available to our species – in the twenty-first century to almost all countries everywhere and to many sub-national groups. In a few decades, there will be no part of the earth so remote that it cannot do immense damage to itself and to others far away.

Like it or not, conflicts have become everyone's business. The idea that states and people are free to conduct their quarrels, no matter how deadly, is outdated in the nuclear age and in a shrinking world where local hostilities can rapidly become international ones with devastating consequences. Similarly, the notion that tyrants are

free to commit atrocities on their own people is becoming obsolete, albeit with plenty of resistance.

In the 1990s, Cyrus Vance was asked by the UN Secretary General to play a peace-making role in Yugoslavia – first in Croatia, later in Bosnia. As he and I reflected on these problems, we were increasingly drawn to thinking in preventive terms. What might have been done earlier and more fundamentally to avert this vast human tragedy? What preventive principles, strategies and tactics might be useful throughout the world? Could the bitter lessons of Yugoslavia (and other similar horrors elsewhere) be turned to the long-run benefit of humanity?

We set out to address the haunting questions of worldwide mass violence in 1994 by establishing the Carnegie Commission on Preventing Deadly Conflict. It consisted of sixteen international leaders and scholars long experienced in conflict prevention and conflict resolution. Cyrus Vance and I were its co-chairmen, with Jane Holl as executive director. It had a global advisory council consisting of thirty-six scholars and distinguished practitioners.

The Commission approached its tasks by asking several fundamental questions:

- What are the problems posed by deadly conflict and why is outside help often necessary to deal with these problems?
- What can be done to resolve disputes at an early stage? What political, economic, military, and social tools are at the disposal of the international community? Which strategies work best?
- What institutions and organizations can effectively use those tools and strategies of prevention?
- What fundamental conditions are conducive to peaceful living? How can the international community help to create these conditions?

The commission published 75 reports and books on subjects related to its core agenda during the five years of its existence. In addition, it sponsored international meetings drawing together independent experts and policy

makers from around the world to consider these issues carefully. A synthesis of these activities was published under the title “Preventing Deadly Conflict.” Taken together, this body of work constitutes a unique resource on prevention.

The recommendations of these 75 reports are addressed to many elements of the international community, among them governments, the United Nations, regional organizations, the business community, the global scientific community, educational and religious institutions, the media, and nongovernmental organizations. What we seek is a way of thinking that becomes pervasive in many institutions and in public understanding.

The Carnegie Commission formulates two broad strategies for prevention. The first is operational prevention, or measures to respond in the face of an impending crisis. The second is structural prevention, or long-term measures to keep a crisis from arising in the first place or to keep it from recurring. The primary example of operational prevention is preventive diplomacy. The primary example of structural prevention is the fostering of democratic socioeconomic development. Let me say a few words about each in turn.

Key Concepts of Operational Prevention

Preventive diplomacy is the prime example of operational prevention – oriented to coping with serious conflicts and imminent crises before they cross the threshold to mass violence. It has shown great promise despite the fact that the world is poorly organized to take advantage of its potential.

Several major new studies sponsored by the commission converge on key points of preventive diplomacy. They combine established knowledge and skill with new insights. They send a strong message to the international community: to governments, inter-governmental organizations, non-governmental organizations of many kinds, and leaders in different sectors.

Here are some key messages for Preventive Diplomacy at the turn of the century.

1. Recognize dangers early; beware of wishful thinking.

2. Respond to serious danger promptly on the basis of careful decision-making, taking into account information from multiple credible sources.

3. In making such responses, do so by pooling strengths, sharing burdens, dividing labor among entities with the capacity and salience to do what is necessary. This may involve some combination of governments, international organizations, and institutions of civil society, including NGOs.

4. Foster widespread understanding of conflict resolution and of violence prevention among policy makers and publics. This involves concepts and techniques as well as attitudes and institutions; and leads to building local or national capacity for coping with conflicts in a just, non-violent way. This also includes the development of negotiation skills in the framework of joint problem solving to meet fundamental needs.

5. Offer mediation early in “hot spots.”

This is flexible, can be provided by governments, intergovernmental organizations, or by nongovernmental organizations. It is less threatening to the adversaries than most other interventions. It can occur early in the course of an evolving dispute. The adversaries can learn a good deal about conflict resolution and violence prevention, sometime in a brief period. They can become intrigued with new possibilities for mutual accommodation. They can be helped to reformulate the problem in ways that involve mutual benefits.

6. Formulate strategies in terms of superordinate goals for antagonistic parties – i.e. goals they both value greatly and can only achieve by cooperation. Such goals may be for example, the end of killing, reunion of families, substantial economic benefits, access to water, coping with regional infectious diseases.

7. Be fully aware of tools for operational prevention and tools for structural prevention. Consider these systematically in relation to the problem at hand. Strive for integration of political, economic, and military tools in formulating a coherent strategy for operational prevention in the event of impending crisis.

8. Bear in mind the full array of relevant institutions and

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**What we seek is a way of
 thinking that becomes pervasive
 in many institutions and in
 public understanding.**

organizations so that robust problem-solving capacities can be brought to bear on the dangerous situation. Who can best use the tools at hand?

9. To change behavior of adversaries toward moderation, use the incentive of prospect for membership in valued international organizations – a sense of belonging and becoming worthy of respect, thereby enhancing prospects for a prosperous and peaceful future.

10. With respect to economic leverage in preventive diplomacy, consider sanctions and inducements jointly, moving toward a coherent strategy that makes clear to adversaries what they could lose through violence and gain through non-violent problem solving. Such measures are most likely to be effective if conducted multi-laterally in circumstances that confer legitimacy.

11. In all of this, support moderate, pragmatic, leaders at all levels including newly emerging leaders in time of stress. They deserve the support of neighbors and the international community through encouragement, friendship, technical assistance, links with counterparts in other communities and the ability to elicit economic benefit for their people. These are leaders inclined to consider just settlement for all the parties; they often operate under great pressure and need international help in order to succeed.

12. Seek ways to strengthen the UN and regional organizations in their preventive functions, including effective mechanisms for linking with NGOs –e.g. special representatives and personal envoys of the UN Secretary General, Friends Groups of the UN or regional organizations.

As experience accumulates, build increasingly explicit norms of fairness, human rights, and democratic process. Foster worldwide understanding of these norms and seek broad acceptance for formulating international laws on preventing deadly conflict.

As guidelines of this sort come to be incorporated into the thinking of governments, intergovernmental and non-governmental organizations – and indeed in public understanding – the risk of drifting into disasters can be greatly diminished.

Key Concepts of Structural Prevention

There are many factors conducive to long-term peaceful living – structural prevention. Among these, none is more

important than democratic development. Here we refer to the value of democratic attitudes, practices and institutions in both political and economic spheres.

Although there are many other elements that are important in structural prevention – e.g. major limitations on highly destructive weapons via international agreements and internal restraints as Pugwash has done so well – I focus here on democratic development because it tends to pull the other factors along. The many, inter-related socio-economic facets of democratic development come together in ways that foster security, well-being and justice even for large and diverse populations – not perfectly, not comprehensively, yet generally in constructive directions with a realistic basis for hopeful lives.

Democratic traditions evolve in ways that build ongoing mechanisms for dealing with the ubiquitous conflicts that arise in the course of human experience. Democracy seeks ways to deal fairly with conflicts and to resolve them below the threshold of mass violence. This is a difficult process, there are failures, and the transition from a closed authoritarian society to a fully viable, open democratic society can be stormy, but this is the best chance for dealing justly and peacefully with the tensions of humanity.

The attitudes, beliefs and procedures of democratic societies are useful in inter-group conflict within and beyond state borders. In government and civil society, processes of negotiation and mediation are common. There is encouragement for seeing the perspective of other people and learning mutual accommodation – starting in childhood. Most people get used to a pluralistic society. They learn to compromise, seeking something satisfactory for all elements of the society. All this is not a panacea, but it is helpful.

There are effective means for promoting democracy internationally. For new, emerging and fragile democracies, it is valuable to strengthen the political and civic infrastructure of democracy through international cooperation. This involves technical assistance, financial aid and social exchanges to build the requisite processes and institutions, including widespread education of publics about the actual working of democracy.

Toward these ends, it is desirable that the democratic community establish special funds to strengthen democracies. Such funds may be administered through non-governmental organizations as well as government agencies and

international multilateral organizations. Funding, technical assistance and human solidarity must be sustained over a period of many years to support the complicated processes of democracy building. There is much more to it than one successful election. A recent sophisticated assessment shows that, despite many obstacles, much can be accomplished.

In the 1990s, the established democracies began to get organized and committed to helping the emergence of new and necessarily fragile democracies throughout the world. Such international, cooperative efforts to build democracy on this scale are recent. The worldwide movement toward democracy is not simple or linear, but it is powerful and encouraging to those who value human dignity, opportunity, creativity – and, yes, survival. Building democratic societies with market economies in a technically competent and ethically sound way is a clear path to structural prevention of deadly conflict.

Democratic Development: Economic Aspects

The establishment of new democracies requires decades or even generations, so we must be persistent and resourceful in working with democratic reformers all over the world. The gradual emergence of democratic and prosperous countries will reduce the likelihood of catastrophic wars. This requires special attention to the Southern Hemisphere and the post-communist countries.

We have learned important lessons from successes and failures of socioeconomic development in Asia, Africa, and Latin America during the past half-century. Yet much of the world's population still cannot rely upon food, water, shelter, and other necessities of life. Why are there still widely prevalent threats to survival when modern science and technology have made such powerful contributions to human well being? What can we do to diminish the kind of vulnerability that leads to desperation? The slippery slope of degradation so vividly exemplified in several areas of abject poverty in Africa and Asia leads to great danger of infectious disease pandemics, civil war, terrorism, mass migration and humanitarian catastrophe.

Many nations in the global south have been late in getting access to the unprecedented opportunities now available for economic and social development. They are seeking ways to modernize in keeping with their own cul-

tural traditions and distinctive settings. They need help in finding ways to adapt useful tools from the world's experience for their own development. It is surely in the interest of countries near and far away to facilitate the development of knowledge, skill and freedom in these countries so they can become contributing, responsible members of the international community rather than breeding grounds for social pathology, disease and violence. An avoidable excess of human suffering generates resentment that can become the seedbed for hatred, violence and terrorism.

In this context, the Carnegie Commission emphasized that economic growth without widespread sharing in the benefits of that growth will not reduce prospects for violent conflict. Indeed, intense resentment and unrest can be induced by drastically inequitable economic opportunity. This reinforces the desirability of helping poor countries to foster political as well as economic development. During the 1990s a substantial effort has been made by individuals and institutions to understand the development experience of the second half of the 20th Century and to learn from it – both its successes and failures. One major feature of this effort has been to take a broader view of the development process, recognizing the crucial importance of *human development*, linking social and economic considerations. One influential source of analysis has come from the human development reports of UNDP.

The approach is carried further in a new book by Amartya Sen, who received the 1998 Nobel Prize in economic science. He views development fundamentally as a process of expanding the real freedoms that people enjoy. Therefore, development requires removal of major obstacles to freedom: poverty, poor economic opportunities linked with systematic social deprivation, neglect of public facilities, social intolerance, tyranny and repressive states. To liberate this unfilled human potential, it is essential to enhance political participation, to receive basic education and health care, and to live in a context of respect for human rights. These circumstances are not only of value to the individual, but they contribute powerfully to economic progress of the society. Like the UNDP reports, he advocates public policy to foster human capabilities and substantive freedoms

There is great preventive value in initiatives that focus on children and women, not least because they make up the

greatest proportion of victims of conflict and because women represent a large and neglected potential for economic, intellectual, and political as well as social contributions. A growing body of evidence shows that the education of females is a highly valuable investment for developing countries. It enhances women's skills and choices, improves their health and nutrition. Health studies show that the more educated the mothers, the less likely that their children will die, regardless of differences in family income. Education helps delay marriage for women, partly by increasing their chances for employment, and educated women are more likely to know about and use contraceptives. With education and modest borrowing opportunities, women contribute significantly to economic growth.

The judicious use of science and technology is a key element in development, yet curiously neglected in many countries as if it were a luxury for rich countries. On the contrary, participation in the world economy now requires a modicum of technical competence everywhere. This must be fostered by international cooperation of scientists and educators.

Altogether, the essential ingredients for development center around knowledge, skill and freedom. Knowledge is mainly generated by research and development; skills are mainly generated by education and training; freedom is mainly generated by democratic institutions.

The UN Secretary General, Kofi Annan, linked equitable economic development with conflict prevention in an address at the World Bank in 1999. He endorsed President Wolfensohn's call for the Bank and its partners to start asking hard questions about ways to integrate a concern for conflict prevention into development operations. Annan said "If war is the worst enemy of development, healthy and balanced development is the best form of conflict prevention."

International Cooperation to Implement the Tasks of Prevention

These great tasks of operational and structural prevention require substantial international cooperation. This is because the problems they address are formidable and widely scattered around the world. Predisposing and precipitating factors for human conflict are ubiquitous. Homo sapiens is a highly contentious species with a dramatically destructive track record. Moreover, the tasks of

prevention are complex, demanding, sometimes expensive, often dangerous. Thus, the effective pursuit of these tasks requires pooling strengths, sharing burdens, and dividing labor. At present, it is not obvious how this is to be done. Individual states, groups of states, the United Nations, regional organizations, non-governmental organizations, and eminent individuals typically approach preventive actions in a groping, uncoordinated way. This reflects the lack of any agreed international violence prevention system. While no single integrated system is feasible at present, more widely accepted and regularized arrangements are necessary and possible.

An ongoing, vital aspect of all efforts to prevent deadly conflict must be education of publics throughout the world. From scientists and professional educators to the UN to grassroots NGOs to international university networks and religious institutions, there is a profound need to address the ascending dangers of violence, constructive ways of dealing with ubiquitous human conflicts, respect for universal human dignity, and paths to peace with justice. The profound threat of prejudicial ethnocentrism as a precursor to hatred, violence and mass killing has to emerge as one of the major educational thrusts of this century: through the media and community organizations as well as educational, scientific and religious institutions.

International Scientific Community

We face the problem of intergroup violence—within or between states—in the twenty-first century in a world increasingly saturated with highly destructive weapons. We see in all parts of the world abundant prejudice, hatred and threats of mass violence. The historical record is full of every sort of slaughter based on invidious distinctions pertaining to religion, ethnicity, nationality, and other group characteristics. In this kind of world, the scientific community has a great responsibility to work in a reasonably unified way so that the physical, biological, behavioral, and social sciences can address these profound and pervasive problems. Crucial world problems do not come in neat packages that match traditional disciplines.

The scientific community first and foremost provides understanding, insight, and stimulating ways of viewing important problems—and can do so with regard to deadly conflict. It can generate new knowledge and explore the

application of such knowledge to urgent problems in contemporary society.

In a world so full of hatred and violence, past and present, human conflict and its resolution is a subject that deserves major research efforts. High standards of inquiry must be applied to this field, involving many sciences functioning in collaborative ways.

The scientific community can also apply the best available knowledge to conflict situations as Pugwash has done so well. Let me sketch one example. In 1978, Pugwash convened a workshop on crisis management and crisis prevention under my chairmanship, involving scientists and scholars from a variety of countries, but principally the United States and the Soviet Union. By 1978, there was cumulative record of analytical studies sufficient to derive some tentative but useful principles of crisis management. How is it possible to emerge from a crisis without a disastrous war, let alone a nuclear war?

Scholars sought a consensus on principles of crisis management and then to convey this consensus as clearly and meaningfully as possible to policy makers and policy advisors in a variety of nations, but especially in the superpowers. If crises were to arise again, it would be valuable for leaders to grasp these principles and follow them as well as they could in order to avoid catastrophe. As the evidence of various crises was considered, scholars were deeply impressed with the difficulty of adhering to such guidelines in the event. The immense strains of international crisis and above all, nuclear crisis test the limits of human capacity to adapt. Therefore, the focus was widened to consider crisis *prevention*. Whatever the level of armaments, and whatever the animosity of the superpowers, it was simply a matter of prudent self-interest to remain a step or two from the brink of nuclear crisis because the tasks of crisis management are so exceedingly difficult. These concerns in both countries led to a joint US-Soviet study group on crisis prevention. For several years, the pattern was to meet about twice a year, with substantial preparation between meetings, including visits of younger scholars back and forth to pave the way. These meetings were characterized by civil discourse, mutual respect, and analysis of ways to reduce the nuclear danger.

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When Gorbachev came to power, the group began to explore the “new thinking,” going beyond crisis prevention to the possibility of basic improvement of U.S.-Soviet relations. The Soviet participants and the American participants both became more significant advisors to government leadership as the years went by. So the work exemplified the increasingly useful dynamic interplay between scholars and policymakers in leading countries throughout the world.

Two recent penetrating studies of Cold War history show clearly that the momentous reformulation of Soviet policy growing out of Gorbachev’s new thinking was strongly influenced by his contacts with the scientific and scholarly community. This occurred primarily through his interactions with leading Soviet physical and social scientists. The contribution of the international scientific community is also clear, primarily through its impact on these Soviet scientists but also through direct encounters with Gorbachev himself as I experienced on several occasions. Gorbachev confirms these observations in a newly published book.

The Cold War experience makes clear that there is a useful role for the scientific and scholarly community in international conflict resolution – usually acting through non-governmental organizations yet often maintaining open lines of communication with governments. There are a few singular advantages: 1) drawing on the science base for accurate information in search of principles and objective analysis. 2) acting flexibly, exploring novel or neglected paths toward conflict resolution; and 3) building relationships among well informed people who can make a difference in attitudes and in problem-solving at home and abroad.

Overall, it is one of the great challenges for science policy and practice to organize a much broader and deeper effort to understand the nature and sources of human conflict, and above all to develop effective ways of resolving conflict without recourse to violence. The scientific and scholarly community is the closest approximation we now have to a truly international community, sharing certain fundamental interests, values, standards, and curiosities about the nature of matter, life, behavior and the universe. The shared quest for understanding is one that knows no

national boundaries, has no inherent prejudices, no necessary ethnocentrism, and no barriers to the free play of information and ideas. This quest is drawn together internationally more than ever by recent advances in telecommunications.

To some extent, the scientific community can provide a model for human relations that might transcend some of the biases and dogmas that have torn the species apart throughout history, and have recently become so much more dangerous than ever before. Science can contribute to a better future by its ideals and its processes, as well as by the specific content of its research, and all these must to be brought to bear on preventing deadly conflict. Governments and inter-governmental organizations can do much more than they are now doing to engage the scientific community in this great mission.

We humans are indeed a single, interdependent, worldwide species with unprecedented powers both for

better and for worse. The benefits we enjoy and anticipate, going far beyond anything our ancestors might have imagined, are largely those flowing from advances in science and technology. The other side of the coin is that the truly unprecedented dangers we face are also the creation of science and technology. In a clear and vivid sense, the modern world is the creation of science and technology in all of its aspects—those which we relish and those which we fear. The fundamental paradox of success must now be seen whole. Science and technology got us here. Can science and technology keep us going, playing a crucial role in diverting the ultimate calamity of nuclear or bacteriological war and fostering for the first time in history a truly common humanity in which decent human relations and a decent respect for our environment may prevail worldwide? At this fiftieth Pugwash Conference, in the eternal spirit of Albert Einstein, this is our greatest challenge.

PLENARY ADDRESS

The Impasse in Nuclear Disarmament

Essay

by John Holdren

As we meet here in Cambridge for the 50th Pugwash Conference some ten years after the end of the Cold War, it's rather dismaying to have to talk about the impasse in nuclear arms control—an impasse that has been afflicting our core field of interest since about the middle of the 1990s. It's partly perhaps a result of the diversity of nuclear dangers that the world faces that it has proven possible for us to make some of them worse, even as we have been making some of them better.

There really is no doubt, of course, ten years after the end of the Cold War that the danger of an authorized deliberate massive use of US and Russian nuclear forces against each other, which was of course the nightmare that plagued everyone during the long 45 years of the Cold War, has now greatly diminished. That danger is certainly smaller.

But the dangers are many and diverse, and there is good reason to believe that some of them have not gotten smaller, and that others have even gotten bigger. For example, the dangers of unauthorized accidental or erroneous use of nuclear weapons, even between the USA and Russia, have probably actually gotten larger for a number of reasons that it is worthwhile reflecting upon. And certainly they are larger in relation to the supposed deterrent benefits of maintaining these very large nuclear forces. In addition, the dangers of regional nuclear war have unquestionably gone up; the dangers of proliferation appear to be going up; and even the dangers of nuclear arms competitions, the dynamic of offense/defense arms races for example, are still with us even though the rationale for such an arms race between East and West has long since disappeared.

The question becomes, how have we managed to do so badly? We were presented at the end of the Cold War with an extraordinary opportunity to diminish the nuclear danger irreversibly and comprehensively, and while we

made some initial progress in that direction, which I will discuss, we have again found it possible to become blocked, to become paralyzed, to become stuck in an exceedingly unattractive situation. If you ask how we managed to do that, I would say, in short, that on the American side of the East/West relationship we have been plagued by deficits of generosity and imagination, focus, and foresight, and by surpluses of arrogance, inconsistency, and unilateralism. The Russian side, for its part, has been crippled by economic distress, by a weakened and divided government, and, until recently, by a sick and politically impotent president.

Positive developments in the early 1990s

But let me go back and start with the early positive developments after the end of the Cold War in relation to nuclear arms control in order to work my way into where we went wrong in more detail and how we might get out of it. You are all familiar with this list. I'll run through it fairly quickly.

The START I Agreement signed in July of 1991, which entered into force December 1994 and has since been implemented, reduced the deployed strategic nuclear forces on the US and Russian side. Deployed strategic warheads have been reduced from 11,000—13,000 on each side, which is what it stood at the end of the Cold War, to 7,000—8,000 warheads each.

That was accompanied by a process of unilateral withdrawals undertaken and initiated both by President Bush and Secretary-General Gorbachev in 1991; unilateral withdrawals of thousands of tactical, that is non-strategic, nuclear warheads. At about the same time the US bombers and flying command posts were taken off of airborne alert and have remained off.

The Lisbon Protocol, the great triumph of diplomacy in May of 1992, brought all four nuclear arms successor states to the Soviet Union under the umbrella of START I. Belarus, Kazakhstan and Ukraine subsequently joined the non-proliferation treaty as non-nuclear weapon states, a great step forward.

Both sides, the USA and Russia, proceeded with voluntary dismantlement, not required by any formal agreement, of many of the warheads that they had withdrawn from deployment, at a rate of 1,500—2,000 nuclear warheads per year on each side.

The Cooperative Threat Reduction Program, better known as the Nunn-Lugar Initiative, starting in 1992 initiated an unprecedented cooperation between the two sides in dismantling delivery vehicles for nuclear weapons and also cooperation on protection of nuclear bomb material. The United States committed itself in 1993 to buy from Russia 500 tonnes of highly enriched uranium made excess by the end of the Cold War, and to use that uranium in blended down form as reactor fuel.

The START II Agreement, signed in January of 1993, committed both sides to reduce their deployed strategic warheads by about another factor of two, to something in the range of 3,000—3,500 each, including the elimination of multiple independent re-entry vehicles on both sides.

All good news so far. But there then followed a period that I characterize as a combination of sins of commission and sins of omission in relation to nuclear arms control.

Sins of commission

I'll start with the sins of commission. The first of these, in my view, was the hasty expansion of NATO which perpetuated an adversarial stance of the West toward Russia that was aggravated not long thereafter by the non-defensive use of NATO forces outside NATO territory, which is something that NATO had pledged that it would not do. Russia then renounced its long-standing "no-first-use" pledge citing weak conventional forces and the need to rely on nuclear weapons to deter conventional attack. The highly enriched uranium deal was imperiled by the untimely privatization of the US Enrichment Corporation which allowed corporate profit motives to take priority over international security interests, and slow down, and ultimately entirely imperil, that transfer of highly enriched uranium. India and Pakistan, as we all know, then in 1998 tested nuclear weapons, both of them raising the specter of regional nuclear war, fueling the argument by hawks everywhere that non-proliferation policies had failed and so we might as well forget about it.

Another sin of commission is that in the aftermath of what I call the "Chinese nuclear espionage flap" in the USA, in the name of protecting nuclear secrets, the USA has cut back on the cooperation of US nuclear weapon scientists with their Russian and Chinese counterparts, cooperation on monitoring arms control agreements, improving the protection of nuclear materials, and so on.

And meantime the USA appears to be careening toward unilateral renunciation of the Anti-Ballistic Missile Treaty—which of course imperils the foundation of nuclear arms control—in order to pursue an unworkable defense.

Sins of omission

Let me turn to the sins of omission. The Clinton administration Nuclear Posture Review at the beginning of the administration in 1993 and 1994 was initially intended by the late Secretary of Defense, Les Aspen, to be a so-called bottom-up review that would examine the fundamental premises about the uses of US nuclear weapons, the purposes of US nuclear weapons, in the aftermath of the Cold War, but it was greatly scaled back when Aspen left office, and failed utterly to address the fundamental questions of “no-first-use”, the purposes of US nuclear weapons, in favor of minor adjustments in the US nuclear posture. And the USA then failed once more to consider the “no-first-use” question when a couple of years later both Germany and Canada suggested within NATO that NATO’s “no-first-use” posture should be revisited.

Russia, of course, as we all know, failed for more than seven years until April of this year to ratify the START II Agreement. The USA and Russia failed in this period to reach a transparency agreement that would permit more far-reaching cooperation on weapons dismantlement and materials protection. The G-7 meanwhile failed to agree, and has still failed to agree, on coming up with funding for the disposition of excess Russian plutonium, which Russia cannot afford to pay for on its own. The United States and Russia have both failed to remove all of their strategic nuclear forces from short reaction time alert, even though again there is no longer any political rationale for having those forces on short reaction time alert. Some 2,000 nuclear warheads on each side remain in this condition and are particularly vulnerable to accidental or erroneous launch.

The Clinton Administration of course failed to prepare adequately for the Senate vote on the Comprehensive Test Ban Treaty that was ratified by Russia but which, as we all know, the US Senate failed to ratify, and I believe that blame is about equally shared between the Clinton Administration for failing adequately to prepare the ground and make the case, and the Senate for an entirely

politically motivated and irresponsible vote.

The five nuclear weapon states altogether failed to commit, both at the 1995 and at the year 2000 Non-Proliferation Treaty Review Conference, to any timetable for the elimination of nuclear weapons. They also have failed ever since the end of the Cold War, as well as before, to admit to permanent membership in the UN Security Council a single non-nuclear weapon state. They failed, in short, to seize the opportunity to devalue the currency of nuclear weapons in international relations. They had the chance to devalue that currency, but didn’t do it.

The rest of the bad news

The entry into force of the START II Agreement, notwithstanding the Russian Duma now having ratified it, remains in doubt because of conditions attached to its entry into force that are unacceptable to the current US Senate; conditions on the succession of parties to the ABM Treaty, which a majority of the US Senate appears to want to scuttle; and conditions on the demarcation between permitted theatre missile defense activities and forbidden national missile defense activities under the ABM Treaty.

Reserve strategic nuclear warheads (as opposed to those already deployed on delivery vehicles), all tactical warheads and all stocks of bomb-usable nuclear materials, remain outside formal controls. There are no treaties governing any of those things and they would remain outside even if START II entered into force.

The US Joint Chiefs of Staff have recently refused to endorse START III levels below 2,000-2,500 deployed nuclear warheads, despite the expressed desire of Russian political and military leaders to go substantially lower—down to 1,000-1,500 nuclear weapons on each side. In the Conference on Disarmament a work program to ban fissile material production for weapons is blocked by the US refusal to accede to Chinese insistence on parallel negotiation to prevent an arms race in outer space. That’s being resisted by the USA in order to preserve options for using space for national missile defense.

Underlying impediments to progress

Let me talk for a moment about the underlying impediments to progress. What is behind this situation? I’m going to focus here on the USA, on the assumption that my colleagues on the panel from Russia and from the

UK will give their own views on what's going on there, but for the United States I think a number of factors have been at work.

One is what in the trade is called "realist theories" about international relations, which I would characterize here as: the proposition that powerful states can and should do as they please without regard for what other states may want; the proposition that nuclear weapons are effective instruments of power; the proposition that non-proliferation either can be achieved by assurances and intimidation and force, or else is unnecessary and doesn't have to be achieved at all, since small nuclear powers will just deter each other and superior US nuclear forces can deter everybody.

The second set of impediments I characterize as "warmed over Cold War thinking." Number one, the United States won so it can do whatever it wants. Two, Russia is so weak that she must threaten a nuclear response in order to deter conventional attack, which of course is exactly the proposition to which the USA clung throughout the Cold War. And finally, the proposition that a nuclear weapon-free world is infeasible and undesirable.

The third set of underlying impediments have to do with lack of public pressure and political leadership. The public understands neither the nature of the danger, nor even the doctrines that apply to the use of nuclear weapons in today's world. Most of the US public does not know that the posture of the USA and NATO remains first nuclear use if necessary. They don't know how dangerous the current situation remains. On the political side, the current Democrats lack the nerve to challenge the old paradigm and the current Republicans lack the brains.

Reasons to be optimistic

There are however a variety of reasons to be optimistic anyway. In spite of all this bad news I was determined, especially after yesterday's Plenary, to make this an upbeat talk. Here's why I think we have reason to be optimistic anyway.

First, the public when it learns the truth becomes alarmed, and then outraged, and then energized. I know this because I've been giving lots of talks on this subject to the public. And when they find out in these talks what's going on they become alarmed, and outraged, and ener-

gized. Again the polls show that most Americans don't now understand the situation. But they are going to understand the situation, and when they do things will have to change.

Secondly, the non-governmental organizations do know the truth already. The Union of Concerned Scientists, the Federation of American Scientists, the Arms Control Association, the Council for a Liveable World, and so on through the list, they know what's going on, and they are gearing up to tell the public, to channel the public's outrage, to harness the public's energy.

The third reason to be optimistic is that the private foundations, whose support for nuclear arms control analysis and activism waned in the latter part of the nineties, are now increasing their support again. They too have figured out what's going on and what is required, and they are going to fund the analysis and the NGO outreach that is going to change this landscape.

The media have already understood, in the USA, that national missile defense is a fraud, a waste, and a menace and they are battering it in cartoons and editorial pieces almost every day. To me that's a little bit like the plastic thermometer that pops up in the turkey when it's done. When the media are so overwhelmingly aware of what is wrong with the national missile defense proposition, it can only be a matter of time until the public becomes fully aware of it as well. And I would argue even further, that ridiculing US "first use" policy in which the nation with the most powerful conventional forces in the world insists that it must continue to rely on a nuclear threat to deter conventional or biological or chemical attack—ridiculing that, is going to prove to be quite easy also. Ridiculing refusal on the US side to match the Russians in deep cuts is going to be easy too. When the American public figures out that the Russians want to go much deeper than the Americans do, and the American authorities aren't willing, again things are going to change.

The military, even the military, is increasingly aware that nuclear weapons and national missile defense drain the limited resources of the armed forces, away from training, away from readiness, away from weapons that might actually be usable and might work. And as a result of that, the support in the military for NMD is thin and, in many cases, is grudging.

Next, the United States political landscape could

change in November's election. If Gore wins, and if the Senate goes democratic, it could be a completely different landscape. Gore certainly has the brains to do the right thing, and he might have the courage. I urge the Americans in this room to help us try to find out.

There are more reasons to be optimistic. A nuclear weapon-free world is not just a dream. It's a necessity. It's the ultimate pragmatism in my view. It's the one long-term goal that makes short-term arms control measures that lead toward it more than just temporizing. The analysis in support of this proposition becomes more persuasive every year.

Secondly, realities can change more quickly than most people expect. The Vietnam war ended when the efforts of the Peace Movement, the impact of insider defections from the Establishment consensus, and the public's first

and second-hand familiarity with the war's consequences combined to make its end inevitable. The combined weight of those factors became too much and the war was terminated. A different set of forces combined to end the Cold War more suddenly and more comprehensively than almost anybody thought possible. In a rapidly changing world, which we are certainly living in, the establishment consensus on the necessity of nuclear weapons could crumble quickly too.

Finally, optimism is the only alternative to despair. Despair is paralyzing; optimism is energizing. Pugwash was founded on optimism and on analysis. With your optimism, your analysis, and your energy, we are going to get out of the arms control impasse that afflicts us today, and we will get to a nuclear weapon-free world.

Thank you.

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Prof. Carlo Schaerf
Department Of Physics
University of Rome “Tor Vergata”
Via della Ricerca Scientifica 1
I-00133 Rome, Italy
Tel.: (+39) 06 72594560/1 Fax: (+39) 06 2040309
E-mail: isodarco@roma2.infn.it

“Don’t Put the World on the Defensive”

by Michael Atiyah

The Boston Globe (Boston, MA), Op-Ed, 6 September 2000

President Clinton has made a wise decision not to proceed with development of a new national missile defense system. Citing a number of factors, including technical uncertainties, the need for more tests, and strong opposition from European allies as well as Russia and China, Clinton acknowledges that it is far too early to say whether missile defenses will enhance America’s security.

However, the president’s decision is being castigated by George W. Bush, ensuring that the idea of national missile defense will be a major election issue. Bush has committed himself, if elected, to push ahead with development and deployment, a decision that could well have far-reaching consequences for the stability the world has enjoyed since the end of the Cold War.

The principal argument for missile defenses is that while the major powers no longer threaten one another, there is an emerging threat from smaller countries or so-called “rogue states.” Proponents believe that it is possible technically to develop an effective system that would defend the United States against such potential threats by intercepting an offensive missile attack. Yet only three of the 19 planned tests have been carried out, and two of these were failures.

At a superficial level the plan is attractive. After all, who can object to a defense system aimed at protecting innocent civilians from the bandits of this world? In American domestic political terms it is hard to oppose. And what is technically possible often becomes politically necessary.

The trouble lies in the potential clash of a missile defense system with the 1972 Anti-Ballistic Missile Treaty, viewed by many as the cornerstone of strategic stability.

The American military has a difficult argument to make. First it has to convince the president and Congress that the system will work (and so should be funded). On the other hand it has to persuade the Russians and the Chinese that it does not work too well; otherwise it might threaten their nuclear capability.

Russia’s president, Vladimir Putin, has moved quickly to get approval for START II but has indicated his strong support for upholding the ABM Treaty. The Chinese have dropped hints that if the Americans go ahead with a missile defense, they may feel compelled to upgrade their nuclear arsenal in self-defense. In Europe, most countries, with the exception of Britain, seem to be opposed to the American plans.

The dangers are clear. The relative stability of recent years may be on the verge of disappearing. We may

be about to see a new phase of the arms race. Trust may vanish and be replaced by suspicion. The whole international climate may become soured.

And for what? To defend America against “rogue states.” Is this really a serious threat, and if so, are ballistic missile defenses the right way to deal with it?

The list of potential “rogue states” includes North Korea, Libya, Iraq, and Syria. It is hard to make a convincing case that any of these pose a serious threat to the United States. It would certainly take many years before they could begin to mount a threat. Meanwhile their neighbors are likely to get much more worried than the United States, electronic surveillance would expose their plans, and the United States could exert other political, economic, or military pressure.

But let us turn the problem around. Are there better ways of handling these countries? Is it possible to integrate them better into the world community so they cease to have the appearance of outcasts? Can we not use the carrot instead of the stick?

Already the situation is changing. North and South Korea have started a constructive dialogue. Syria, under Assad, started peace talks with Israel that might resume under the new regime. Libya is coming back into the fold. Only Iraq remains a real difficulty, but there appears to be no real US policy beyond an irregular and uncertain bombing strategy, which

merely perpetuates the regime.

A political approach to “rogue states” involving dialogue and economic aid seems more sensible. Poor inhabitants of these countries would benefit, and it might lead to democratic progress. This would provide much more genuine security at a fraction of the cost of a missile defense system.

The United States is leading the way in the economic and financial integration of the world. It should be following this up politically. Hiding behind a fortress America mentality is out of keeping with the new world we are entering in the new century.

Unfortunately, many politicians see the missile plan as a vote-winning issue, and up until now neither

Clinton, Gore, nor Bush could afford to appear soft on the issue.

In Britain we see a similar process. The Labor Party, after losing elections, abandoned its call for doing away with nuclear weapons. It makes much of the special relationship with the United States and has not joined European criticism of US policy.

Equally, in Russia, it is already clear that Putin has to pay attention to nationalist public opinion and that his room for compromise with America is limited. He cannot be pushed too far.

The situation in China is different, but in the future we may have to deal with a democratic regime more likely than Russia to be a significant

economic force.

In making his decision not to proceed with full-scale missile defense development at this time, Clinton took many of these concerns into account.

The role of Britain is also crucial here. Since we have been the strongest supporter of US foreign policy in recent years, adding our weight to other European concerns might just cause the next president to reconsider before rushing ahead with a national missile defense system. Clearly such a step by the government would take some courage and would put a strain on the “special relationship,” but in the last resort, a real friend must be prepared to criticize.

“Nuclear Disaster May Still Be Averted”

by Gwyn Prins

The St. Petersburg Times (Russia), 25 August 2000

Over the last week and a half, before the horrified gaze of the world, the Kursk joined the ranks of dead Russian nuclear submarines, most of which are to be found in the Kola Peninsula of Northwest Russia. But if the tragedy focuses attention on the country’s wider and ballooning nuclear waste problem, if it can summon up the political will in Russia and abroad to deal with it, then some good may yet be salvaged. There is still time—just.

In a comprehensive review of radioactive sources in the Kola/Barents region, the Swedish Defence Research Agency (FOA) concluded that the Kola Peninsula is currently

one of the most radiation-free places in Europe: a bit of strontium 90 from the atmospheric atom bomb tests of the 1950s—you get that everywhere—but on land you only find background radon, and although in the Barents, Kara and White seas you find caesium 137, over 50 percent of that is washed up by currents from Sellafield, the British nuclear reprocessing plant.

Unfortunately, the Kola Peninsula also boasts the greatest concentration of *latent* potential for a catastrophic release of radioactivity on the planet. The courageous Yablokov “White Book” audit of 1993, ordered by President Boris Yeltsin, opened this issue to scrutiny: The facts and fig-

ures all up together in a row make for frightening reading.

There are more operating and defunct reactors sited here than anywhere else—178 and more than 140 respectively (the Yablokov figure).

The Soviet Union built 287 nuclear submarines, containing over 500 reactors, between 1954 and 1996, of which a minimum of 183 (and perhaps as many as 245) are now out of service. Of those, at least 120 still have fueled reactors.

The Northern Fleet itself has 142 submarines and three battle-cruisers (making 300-plus reactors) in or out of service. Then there are 10 ice-breakers and one container ship. In addition to the queue of superannuated nuclear submarines and other ships awaiting disposal, the tally includes 16 dumped reactors, includ-

ing six with unrecovered fuel from nuclear accidents (e.g., the icebreaker Lenin.) And now we have the two fueled reactors of the Kursk.

There is also an overflow of spent nuclear fuel needing containment, of which 10 percent is damaged (the Yablokov report counted 30,000 assemblies containing 2.3 million curies of radioactivity in 1993). And, of course, there is the Kola power station.

Of its four unshielded VVER 440/230 and 440/213 reactors, the older pair (440/230) are judged by the International Atomic Energy Agency to have a 25 percent likelihood of critical failure in the next 20 years. Kola, incidentally, is the power station that powers the pumps which cool shut-down submarine reactors awaiting decommissioning and disposal. When the local utility company cut the navy off for non-payment of bills a few years ago, special forces bearing sub-machine guns appeared to help it change its mind. A new Kola station is planned. In the FOA risk ladder, the current Kola station comes top, followed by the chances of a refuelling accident with current submarines, the masses of ill-contained or audited spent nuclear fuel, and then the armada of dead submarines.

Adequate technical provision to deal with these hot potatoes is neither present nor planned. Hope rests principally with the Mayak reprocessing plant near Chelyabinsk in the Urals, with Western-funded medium-term storage under construction there. However, a shortage of the specially equipped rolling-stock restricts the capacity to move spent nuclear fuel

to Mayak. A long-term repository is still at the discussion stage. The Russians want to put it on the island of Novaya Zemlya in the Far North, which is hard to reach and with its geology well fractured by scores of underground nuclear tests; Western experts favour a site on the Kola, near the spent fuel. But an early agreement is not on the cards.

This situation is directly a product of the myopia characteristic of nuclear industries. They tend to think in straight lines, and then only about the bits that they like, rather than in full cycles, unless forced to do so. Only now, with the dead armada swelling, is the Rubin Design Bureau, whose gifted engineers helped to build the Soviet submarine fleet (including the Oscar II design of the Kursk), being asked to un-design them.

Secondly, such short-term provision for the storage of spent nuclear fuel as has been built has been much reduced by past accidents which only came to light in the Yablokov report. Two storage ponds at the Murmansk naval facility at Andreyeva Bay had to be abandoned in 1982 because poor construction led to massive leakage.

The storage pool and dry dock at Gremikha failed too, for similar reasons, and the Norwegian environmental organization Bellona has evidence that drunkenness in the work-force prevented repair. Spent fuel has thus been left in transit flasks which have leaked, or deposited in Northern Fleet service tenders. Four—in Murmansk and Severodvinsk—give special cause for concern, being over 25 years old and

filled to capacity. With nowhere better to put this waste, however, these floating barges are excellent candidates for future accidental releases.

Meanwhile, the block decommissioning of the Soviet fleet is producing increasing volumes of fresh spent nuclear fuel, at least 30 cores-worth a year. The government is committed to decommissioning 150 submarines by 2007. The best of a series of bad options appears to be to leave the fuel in the shut-down reactors, i.e. in the hulks of the submarines. Leave them too long, however, and the fuel channels may distort. Defuelling then becomes impossible, so the entire reactors have to be disposed of.

Also unmaintained, submarine hulls corrode and some have sunk at their moorings, which then means salvaging and propping them up with pontoons. The Nuclear Power Ministry has reported that at least 30 are at imminent risk of sinking, while 17 Victor and November class hulks located at Gremikha are too dangerous to tow away.

Neither is it just a question of the West handing over the cash for a clean-up operation—which it is reluctant to do with memories of IMF money gone astray still fresh, or of an European Union Auditors' report on funding nuclear power station safety, which disappeared entirely from view. More pertinent is that at a recent meeting between the two sides, the Russians quoted a dollar-per-cubic-meter figure for waste disposal that was twice the Western one. Technicians and equipment could be provided instead, but the Russians were affronted at the suggestion. Stalemate.

And then there is the Nikitin case. Put on trial for revealing details of the kind of problems listed above, former navy Capt. Alexander Nikitin was finally acquitted by the Supreme Court on 17 April, amid general rejoicing by environmentalists and supporters of free speech. Then, amazingly, he was charged again—for the 10th time.

But just as sinister as the case are its consequences. The courts found that, at the time of the offence, no law existed which Nikitin had broken, so, by definition, he was innocent. Now there is a law, that works in five easy, Kafkaesque, steps. One, there are secret matters that are not to be revealed; two, they are listed; three, the list itself is secret; four, ignorance is no defense; five, there exists no concept of “public interest” defense.

So, as a leading dissident (we use this language again, regretfully) explained to me, no prudent Russian will dare to speak publicly about any environmental issue except the welfare of sea-birds. The onus is back on outside organizations such as Bellona.

The safe management of radioactivity can suffer no compromises. Any and all external aid must be targeted primarily at building a comprehensive partnership within which Western and Russian engineers and equipment work in harness. Requirements of general security insist on this. That a British rescue team was requested, late in the day, to assist with the Kursk, is perhaps one glimmering point of optimism that may be seen as the swirling, murky, waters close over the disaster.

Is the Pugwash Movement Ready for New Challenges?

By Ejaz Haider

The Friday Times, Lahore, Vol. XI No. 25, August 18–24, 2000

The 50th Pugwash Conference on Science and World Affairs titled, “Eliminating the Causes of War,” met at Queens’ College, Cambridge, UK from August 3–8. The annual conference was attended by over 150 participants from 45 countries around the world.

The Pugwash Conferences are eponymous with Pugwash, a small village in Nova Scotia, Canada, where the first meeting was held in July 1957. The meeting, which brought together 22 eminent scientists from 10 countries of the world, was hosted by an American philanthropist, Cyrus Eaton, who was born in the village of Pugwash. The stimulus for the meeting was the 1955 Russell-Einstein manifesto, signed at the time by nine other eminent scientists, including Nobel Laureate Sir Joseph Rotblat, who, according to Mike Moore, editor of *The Bulletin of the Atomic Scientists*, today “embodies Pugwash.” The Manifesto by Albert Einstein and Bertrand Russell, known originally as “A Statement on Nuclear Weapons,” was a response to the testing of thermonuclear devices by the United States and the Soviet Union. Since the first meeting at Pugwash, there have been over 250 Pugwash conferences, symposia and workshops and the number of living “Pugwashites” around the world stands close to 3000.

Interestingly, as Dr Zia Mian points out: “The...irony is that

‘Pugwash’ could actually have been ‘Delhi.’ The meeting set up after the Einstein-Russell manifesto was planned for Delhi, at the invitation of Homi Bhabha and [Jawaharlal] Nehru. Russell is said to have sent out the letters of invitation to Delhi. But then things came unstuck. Thus the meeting moved to Pugwash, with Eaton paying the bill.”

When it began campaigning against nuclear weapons and in favour of nuclear weapons arms control and disarmament in the late fifties, Pugwash brought together the finest expertise in the field despite opposition and criticism by policymakers and “realist” strategists. It provided the expertise and the alternative paradigm (which looked at security as a holistic concept not in terms of balance of terror but in terms of “humanity.” As the Manifesto said: “Shall we instead, choose death, because we cannot forget our quarrels? Remember your humanity, and forget the rest...”) when the developed world, especially the United States, began to think in terms of some kind of nuclear weapons arms control. This mindset was the basis of the breakthrough Pugwash got with the signing of the PTBT (Partial Test Ban Treaty) of 1963 within six years of the first meeting. The movement played a significant role in providing expertise and stimulus for the negotiations and signing of the Nuclear Nonprolifera-

tion Treaty (NPT) in 1968, the Anti-Ballistic Missile Treaty (ABM) of 1972, the Biological Weapons Convention (BWC) of 1972 and the Chemical Weapons Convention (CWC) of 1993.

The work over four decades finally managed to create what has come to be known as the “nonproliferation norm.” In 1995, at the NPT Review Conference, that norm was established when the RevCon extended the treaty indefinitely. The same year, in October, Joseph Rotblat, then President of Pugwash, and the Pugwash Conferences for Science and World Affairs, won the Nobel Prize for Peace in two equal parts. This was a great moment for Pugwash Conferences, not only for its ability to bring the best experts in the world together and campaign consistently against proliferation of nuclear weapons, but also because it had evolved as a forum which could speak on these matters from what has been described as the “policy-relevant” angle. The following year, 1996, saw negotiations on, and the signing of, the CTBT (Comprehensive Test Ban Treaty). The treaty was to be ratified finally in September 1998. The norm Pugwash had helped establish, taking advantage of its own expertise, but more significantly of the changed mindset in official circles which allowed it to bring that expertise to bear on policy-making, had finally crystallised.

It had everything going for it. And then the unimaginable happened with first India’s and then Pakistan’s nuclear tests. South Asia had cocked a snook at the developed world, especially the Club of Five, and the

“norm.” The going from thereon has been tough for Pugwash, as was clear from the closing address of Sir Michael Atiyah, President of Pugwash, at the recent annual conference. Among other problems, Atiyah listed the decision by the US Administration to carry on with the “highly controversial US missile defense program [which] raise[s] the grim prospect of a renewal of the nuclear arms race.” “Other dangerous developments on the world scene include the failure of the US Senate to ratify the CTBT, certain changes in Russian nuclear doctrine, further nuclear proliferation, and the latent danger of terrorist use of weapons of mass destruction, including biological and chemical.”

Interestingly, Atiyah’s closing address, which was in the Pugwash spirit, went against the presentations in a plenary session by Russian and British speakers. While the British presenter listed the achievements of the United Kingdom in terms of reducing its stockpile of nuclear weapons, to rely as the UK now does—since the Strategic Defence Review of 1998—only on four Trident submarines, he was clear about the need for a minimum deterrent. Moreover, he asserted that any further movement by the UK towards disarmament would depend on the other nuclear powers after they have reached the minimum level presently maintained by his country.

The Russian presenter not only defended his country’s nuclear arsenal, but maintained that in view of the strategic asymmetry caused by the US missile defence programme, the growing inferiority of Russian

conventional force strength, the higher costs of maintaining greater conventional forces, NATO expansion and US unilateralism—symbolised by NATO’s war against Yugoslavia—the Russian Federation could not but rely on its nuclear forces. In fact, his entire presentation was an attempt to defend Moscow’s official position, a far cry from the Pugwash agenda.

Atiyah’s closing address was therefore a refreshing reminder of the Pugwash charter, symbolised by what the Russell-Einstein Manifesto said: “Shall we put an end to the human race or shall mankind renounce war?” Atiyah mentioned the need to take “bolder steps,” calling upon the “nuclear powers to implement their ‘unequivocal undertaking to accomplish the total elimination of their nuclear arsenal’ made at the Sixth Review Conference of the Non-Proliferation Treaty in April 2000.” That *is* the catch. While South Asia’s nuclearisation might have broken the norm, South Asia never really provided the real challenge to Pugwash, though it has now, in conjunction with other factors, brought the challenge closer, and sooner, to Pugwash.

Let us put it this way: Even if India and Pakistan had not tested, or the US Senate had ratified the CTBT, or the US government had not embarked upon the missile defence programme, or even the Russian Federation had not announced its greater reliance on nuclear weapons by rejecting the so-called doctrine of no-first-use, the challenge to Pugwash would still have come: how to move from nonproliferation to disarmament. The added irritants have

only complicated the situation and threaten to unwind the whole system at greater speed than if none of the above had happened. Pugwash expertise and policy-relevant initiatives could work in an atmosphere where the leading countries came to appreciate the imperative of nuclear arms control. Given the gravity of the situation at the time—"the Cold War, marked by the Berlin Crisis, the Cuban Missile Crisis, the invasion of Czechoslovakia and the Vietnam War"—and the realisation by the Kennedy Administration of the need to do something to contain horizontal proliferation and introduce bilateral arms control, Pugwash could contribute to the effort. Having achieved the nonproliferation norm in a hypothetical situation in which all else would have stayed normal, the challenge would have been, as said, the movement from nonproliferation to disarmament.

That is where Pugwash would have largely lost its relevance to policymaking. The situation is now more complicated because our hypothetical situation does not exist and the nonproliferation agenda is today more threatened than ever before, notwith-

standing the undertaking by the P-5 at the 2000 RevCon to move towards total disarmament. The question for Pugwash now is: Where does it go from here? This is not to say Pugwash Conferences should pack up and disappear, but that it should redraw its strategy on how to regain its effectiveness in the present situation. As a movement against nuclear weapons and war in general it can live on, but the question relates to its relevance to policymaking. That is what made Pugwash more prestigious and more prominent than other such efforts. That is what now threatens to reduce it to just one of the many fora that routinely point to the dangers of war and weapons of mass destruction without necessarily being able to do much to actually change the situation on the ground.

At his final presidential address to the 47th annual conference, Rotblat is reported to have said: "The questions that nag me are: Was there a need to have done more? Should we have done more? I cannot help feeling that the answer to both questions is yes. Yes, there was a need to have done more, and therefore, yes, we should have done more."

There is greater need today than when Rotblat spoke these words for Pugwash to do more. The fight lies not so much in the domain of technology and science—though that is very significant—but in the domain of strategy: How can the world get rid of the theory of deterrence, or can it? Or should it? After all, wars happened, and are likely to happen, even if there are no nuclear weapons. And as experts working in conflict zones say, statistically more people have been, and continue to be, killed by small arms than by weapons of mass destruction. These are difficult and complex questions and do not lend easily to Cartesian modes of analysis. It is a difficult task. Pugwash Conferences cannot do it alone or overnight. Its significance lay in being able to provide expertise and reach out to the policymakers. For any future progress, it will have to keep in mind the deteriorating security situation and come up with viable solutions. What made it different from other fora was its ability to translate its charter and its statements into achieved goals. It remains to be seen whether it can continue to do so in the present situation.

The Principles of Global Security

John D. Steinbruner
University of Maryland

"surveys the major implications for security policy resulting from the globalization of economic activity, particularly advances in information technology, population growth, and uneven distribution of wealth"

(Brookings Institution Press, 2000)

Canadian Pugwash A Tribute to Bill Epstein

The Canadian Pugwash Group gave a Lifetime Achievement Award to Bill Epstein for his tireless work for nuclear disarmament for more than five decades. The event took place at a dinner in Toronto October 21, 2000, attended by Bill's Canadian friends. Unfortunately, Bill, recovering from a bout of pneumonia, was confined to his home in New York. But that did not deter the enthusiasm of the attendees, who saluted Bill via a video camera recording later

sent to him to view.

Letters of tribute and affection were read from Pugwash leaders Jo Rotblat, Sir Michael Atiyah, George Rathjens, U.N. Under-Secretary General Jayantha Dhanapala and several other prominent world figures. One of the early figures in the Pugwash movement, Bill was honoured for his indefatigable work in pressing the nuclear disarmament agenda on every one of the seven U.N. Secretaries-General. "Bill

Epstein is one of the heroic figures in nuclear disarmament and he is a role model for us all," said Senator Douglas Roche, O.C., Chairman of the Canadian Pugwash Group, who chaired the dinner.

[Editor's Note: In addition to attending more than 35 Pugwash meetings, the first being the 14th Pugwash Conference in Venice, Italy in April 1965, Bill has served as a liaison from Pugwash to the United Nations in New York for many years.]

STUDENT/YOUNG PUGWASH

International Student/Young Pugwash is Now Being Established

Report

*by Tom Børsen Hansen,
chairperson of the Interim
Committee of International
Student/Young Pugwash*

Let me start with some background information. Since the first International Student/Young Pugwash (ISYP) pre-conference in Lillehammer in 1997, Student/Young Pugwashites have discussed the possibilities of forming an International Student/Pugwash Organisation. At the 1999 pre-conference in South Africa we formed an Advisory

Board, which should investigate the funding possibilities and the formal requirements of setting up such an organisation. The Advisory Board, consisting of Sandra Ionno (SPUSA), Tannia Falconer (S/Y Pugwash Mexico), Jeffrey Boutwell (Observer on behalf of the Pugwash Conferences) and Paul Guinnessy (S/Y Pugwash UK, and chairperson of the Advisory Board), hired Hugo Estrella as International Coordinator for six months. The work of the Advisory Board and the Coordinator resulted in a series of memos, which was presented to the Student/Young representatives at the Pugwash Cambridge

conference this year. At the conference in Cambridge, the Student/Young delegates agreed to hold an election to an Interim Committee of ISYP, consisting of seven voting members.

Five of the seven members of the Interim Committee must have a regional affiliation (one member from each of the regions: Africa, Asia, Europe, Latin America, and North America/Australia). Two of the members have no specific geographical affiliation. The elected representatives of the Interim Committee are: Gina van Schalkwyk (South Africa), Hugo Estrella (Argentina), Jin Xie (China),

Susan Veres (US), Carsten Rohr (UK), Lise Østby (Norway), and Tom Hansen (Denmark, and chairperson of the Interim Committee). A non-voting member of the Interim Committee, representing Pugwash, is Sir Joseph Rotblat.

This is a very exciting step to formalise a network between all existing Student/Young Pugwash National Groups, and to establish a permanent office responsible for co-ordination and support for all national groups, and to support the setting up of new Student/Young Pugwash groups in countries currently lacking a group. It will also help to enhance and co-ordinate contacts and communication between Student/Young Pugwash and Pugwash.

The Interim Committee is responsible for setting up a legally recognised International Student/Young Pugwash Organisation. In Cambridge we agreed to give the Interim Committee the following tasks: conduct fundraising and write proposals, write a budget for the ISYP, design office structures, research and establish a legal structure of ISYP, establish a 6-month work plan, research the best option for office space, and decide upon its establishment, research and write a job remit for the ISYP Executive Director, draft election procedures for the organisation's board, hold the elections for the board, maintain contact, distribute information, and gain input from National Student/Young Pugwash groups, and prepare ISYP nomination procedures for the Pugwash Conference in India 2001.

The Interim Committee started working at the end of September after the result of the election was

known. We started our work by sharing ideas and constituting ourselves. We split into three groups dealing with the legal structure, fundraising, and setting up an office (including maintaining contact to the National Student/Young Pugwash Groups and to the National Pugwash Groups). As a first achievement we have a draft of the Statutes of ISYP ready for discussion on our web page (web-address: see below). Discussion papers detailing the remaining tasks will also be placed on the website.

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***The problems facing Humanity
are complex, and cannot always
be reduced to and resolved in
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.....

We want the formation of ISYP to be as open and inclusive as possible. We hope that many Student/Young as well as Senior Pugwashites will be willing to discuss, inspire, and take part in the process of making International Student/Young Pugwash a reality. Hence we invite everybody to visit our web page and follow and comment on the formation of our organisation. We accept good advice and useful information with gratitude.

I will end this short article with my personal vision for the organisation. As I see it an international organisation of young committed students and scientists, such as ISYP, has at least three purposes:

1. It should support young committed students and scientists to choose the path of a "Humane Science" (a

Science that benefits Humanity) and not just follow the crowd. This includes forming local as well as global networks of "humane" young students and scientists enabling them to support each other. It also means to challenge and change mainstream scientific research and science education and to relate science to the "Humane Imperative."

2. This organisation should also support emancipative initiatives, which are not necessary restricted to the sphere of science. The problems facing Humanity are complex, and cannot always be reduced to and resolved in only one sphere. On a longer time scale this approach might lead to the formation of new types of mainstream research programs as well as educational institutions that have the problems of Humanity as their "object," and the solution of these problems as their purpose. In this longer time perspective, purpose one—mentioned above—and purpose two will converge.

3. The organisation must be global, because many of the threats facing Humanity are global, and hence can only be solved globally. The organisation should be locally based in every inhabited continent of the World. This means that groups should be formed and supported all over the world. Now Student/Young Pugwash Groups exists in about 30 countries. Since the election took place contact persons have been found in at least four new countries: Serbia, Peru, Italy, and Papua New Guinea.

The progress of International Student/Young Pugwash can be followed at: www.student-pugwash.org.

Mark Oliphant

(1901–2000)

Sir Marcus Laurence Elwin Oliphant, who died on 14 July, 2000, at the age of 98, was one of the “originals”, a participant in the First Pugwash Conference in 1957; he probably was the oldest Pugwashite. He participated in a number of early Pugwash Conferences and in the South-East Asia Regional Pugwash Conference in Melbourne, in 1967.

Born in Adelaide, South Australia, he made his mark as a scientist in England, where he resided—on and off—from 1927 until 1950. The earlier part of that period was spent in Cambridge, as a member of the legendary team which—under the leadership of Lord Rutherford—produced the fundamental discoveries in nuclear physics that made the Cavendish Laboratory the Mecca for scientists during the years between the two World Wars. Oliphant’s main contributions were the discovery of tritium, the third isotope of hydrogen, and the establishment of the reactions that take place at collisions between deuterons (the nuclei of the second isotope of hydrogen). Ironically for Oliphant—the later anti-nuclear campaigner—the main practical applications of his work were for military purposes: tritium is used as a booster in the fission bomb, and the fusion reactions are the basis of the hydrogen bomb.

During the War years, 1939-45, Oliphant made two vital contributions to the war effort. One was in radar. The resonant cavity magnetron, developed under his guidance, increased manifold the power of the radio beam transmitted at very short wavelengths, making radar into a practical tool to detect approaching enemy aircraft. It is the general opinion that this greatly contributed to the defeat of the Luftwaffe during the 1940 Battle of Britain, thus preventing Hitler’s invasion of England. It was largely Oliphant’s drive and indefatigability that made this possible.

A somewhat similar role was played by him in the development of the atom bomb. Some research on it had already begun, in England, in 1939, but the main impetus came after the calculations by Frisch and Peierls, early in 1940, which showed that the critical mass for a divergent

chain reaction, propagated by fast neutrons in uranium-235, was only a few kilograms. It was Oliphant who brought the Frisch-Peierls Memorandum to the attention of government authorities. As a result, the MAUD Committee was set up, charged with the development of the atom bomb.

Most of the experimental research on the physics of the bomb was carried out in Liverpool, where Frisch joined Chadwick’s team. By 1941 the scientific feasibility of the bomb had been established, but the separation of the uranium-235 isotope was too difficult a task for Britain under wartime conditions.

While on a trip to the United States on radar business, in 1941, Oliphant discovered that no work was going on in the USA on the atom bomb, although the Report of the MAUD Committee had been sent to the relevant authorities. He immediately told a few friends about the British findings. The setting up of the Manhattan Project can be said to be the outcome of Oliphant’s indiscretion!

Oliphant vehemently opposed the use of the atom bomb on the Japanese cities. He never overcame his feelings of guilt about the part he played in the Manhattan Project, and he frequently expressed his views publicly. He also took an active part in international campaigns against nuclear weapons, particularly in Pugwash. He fully shared the Pugwash precept that scientists have a moral duty to be concerned about the social impact of their work. Describing himself as a “belligerent pacifist” he asserted his conviction that war itself is evil and should not be tolerated by humanity.

A figure larger than life with a booming laugh, Oliphant delighted in controversial discussions and was never shy of challenging authority. As a scientist he was imaginative and creative; as a public figure he abhorred secrecy and fought for openness in all walks of life. As a human being he had a strong belief in social values and—despite occasional scepticism—he deeply cared for humanity.

—Joseph Rotblat

H.B.G. Casimir

Prof. H.B.G. Casimir, the distinguished Dutch physicist famous for the “Casimir Effect,” died this year at the age of 80. Prof. Casimir attended several Pugwash meetings and in the 1980s served as a member of the Bellerive Group, founded and financed by Prince Sadruddin Aga Khan, which concerned itself with important social and scientific problems, including nuclear weapons and arms control. Casimir worked for many years for the Philips industrial corporation in the Netherlands, helping to develop their extensive line of electronic devices. Prof. Casimir had a quiet, modest yet persuasive personality, and he was greatly liked and respected by all who worked with him.

—Martin Kaplan

Adam Yarmolinsky

Prof. Adam Yarmolinsky, who served in numerous capacities in the Kennedy, Johnson and Carter administrations, died in January 2000. Besides serving in the White House, Yarmolinsky held posts in the Arms Control and Disarmament Agency and was an aide to Secretary of Defense Robert McNamara in the Pentagon, where Yarmolinsky was an early critic of American policies in the Vietnam war. Following government service, Prof. Yarmolinsky became Regent’s Professor of Public Policy at the University of Maryland, and he was also a founding member of the Institute of Medicine of the US National Academy of Sciences. Although he attended but one Pugwash meeting, a 1993 workshop on military and civilian R&D in London, Prof. Yarmolinsky’s candor and intellectual honesty were very much in the Pugwash tradition.

Paolo Farinella

Professor Paolo Farinella died on March 25, 2000 after suffering a heart attack and complications from heart transplant surgery that took place in February. He was 47 years old and had been in poor health since the previous July.

Farinella was a Professor of Physics at both the University of Trieste, Department of Astronomy, and the University of Pisa, Space Mechanics Group. His main field of research, and the one dearest to him, was on the Yarkovsky effect. Farinella’s study of this effect represents the peak of a lifetime of research on interplanetary dynamics and the collisionary evolution of asteroids. His many articles and publications have received international recognition, and serve to reflect his vast scientific production.

Paolo began his 14-year association with Pugwash by attending the 1986 Pugwash Workshop, “Conventional Forces in Europe”, in Castiglioncello, Italy. He attended a total of eight Pugwash conferences and workshops, the last of which was the 1992 42nd Conference: “Shaping Our Common Future: Dangers and Opportunities” in Berlin, Germany.

Paolo Farinella was a member of the Division of Planetary Science of the American Astronomical Society, the International Astronomical Union, the Scientific Council of *Unione Scienziati Per Il Disarmo* and the Forum on the Problems of Peace and War. He also served as Associate Editor of the international scientific journals *Icarus* and *Meteoritics & Planetary Science*. In 1987, Paolo had Asteroid (3248) Farinella named for him in honor of his research on the dynamic and collisional evolution of asteroids.

Paolo Farinella will be greatly missed and long remembered for, as noted by Paolo Cotta Ramusino “how much his presence has enriched all of us...”

Pugwash Council for the 1997–2002 Quinquennium

Prof. Ulrich Albrecht graduated in aeronautical engineering, political science and economics at Stuttgart University. Since 1972, he has been professor of peace and conflict studies at the Free University of Berlin. He has worked as a consultant for the UN (Dept. of Disarmament Affairs), and served as head of planning in the East German Ministry for Foreign Affairs during the reunification process; Free University of Berlin, FB PolWiss. WE4, Kiebitzweg 3, 1000 Berlin 33, Germany, Tel. (+49-30) 838-2361, Fax: (+49-30) 838-5013, E-mail: ualbr@zedat.fu-berlin.de

Sir Michael Atiyah, President of Pugwash, is a mathematician, Master at Trinity College in Cambridge (1990-1997), and former president of The Royal Society (1990-1995). He was the first director (1990-1996) of the Isaac Newton Institute for Mathematical Sciences, and received the Fields Medal in 1966; Dept. of Mathematics & Statistics, James Clerk Maxwell Building, King's Buildings, Mayfield Road, Edinburgh EH9 3JZ, Scotland, E-mail: atiyah@maths.ed.ac.uk (*)

Prof. Gabriel Baramki, a Palestinian living in Ramallah on the West Bank, is a chemist, former secretary-general of the Council for Higher Education, consultant on higher education to the Ministry of Higher Education, and former vice president (acting president) of Birzeit University; Council for Higher Education, P.O. Box 17360, Jerusalem (via Israel), Tel. (+972-2) 995-4490, Fax: (+972-2) 995-4518, E-mail: baramki@baraka.org

Prof. Francesco Calogero is professor of theoretical physics at the University of Rome "La Sapienza", former Secretary-General of Pugwash (1989-1997), and Chair of the Pugwash Council; Pugwash Conferences, via della Lungara 10, I-00165 Roma, Italy, Tel. (+39-6) 687-2606, Fax: (+39-6) 687-8376, E-mail: calogero@uniroma1.it (*)

Prof. Ana María Cetto is head of the department of theoretical physics, former dean of the faculty of sciences at the National University of Mexico, Chair of the Pugwash Executive Committee; and for 1999, a consultant on the World

Conference on Science for UNESCO in Paris; UNESCO, Science Sector, 1 rue Miollis, F-75015 Paris, France, Tel. (+33-1) 4568 4720, Fax: (+33-1) 4568 5823, E-mail: a.cetto@unesco.org (*)

Lt.-Gen. Emmanuel Erskine is a retired general from Ghana who served in several commanding capacities with United Nations Peacekeeping Forces, especially in the Middle East; PO Box 8843, Accra-North, Accra, Ghana, Tel. (+233-21) 775 946, Fax: (+233-21) 775 990 (*)

Dr. Esmat Ezz is a toxicologist and retired general from Egypt who has been deeply involved in international negotiations and verification activities on chemical weapons. Currently he is a professor at the Military Academy in Cairo; 43 Misr Helwan Road, Maadi, Cairo, Egypt, Tel. (+20-2) 350-5899, Fax: (+20-2) 340-7915, E-mail: e_ezz@hotmail.com

Academician Vitalii Goldanskii is the former director of the Institute of Chemical Physics of the Russian Academy of Sciences, Moscow; Institute of Chemical Physics, Academy of Sciences, ul. Kosygina 4, Moscow 117334 Russia, Tel.: (+7-095) 137-3545, 939-7202, Fax: (+7-095) 938-2156, 137-8318, E-mail: vig@center.chph.ras.ru (*)

Chen Jifeng is Secretary General of the Chinese People's Association for Peace and Disarmament (CPAPD), Beijing, China. Formerly he served as Council Member of the Chinese Association for International Understanding. CPAPD, 15 Wanshou Road, P.O. Box 188, Beijing 100036, China, Tel. (+86-10)68271736, Fax: (+86-10)6827 3675, E-mail: cpapd@sina.com

Maj.-Gen. Leonard Johnson is a retired Canadian general who served at intermediate and high levels of command and staff during 35 years in the Canadian Forces. On retirement, he had completed four years as Commandant of the National Defence College at Kingston, Ontario. A Pugwashite since 1985, he was until now chairman of the Canadian Pugwash Group; 172 Sunnyside Road, RR2, Westport, Ontario K0G 1X0, Canada, Tel. (+1-613) 273-3000, Fax: (+1-613) 273-4269, E-mail: general@rideau.net

Dr. Venance Journé is a physicist now working at the International Centre for Research on Environment and Development (CIRED) in Paris; CIRED, 45 bis, Avenue de la Belle Gabrielle, F-94736 Nogent sur Marne CEDEX, France, Tel. (+33-1) 43 94 73 98, Fax: (+33-1) 43 94 73 70, E-mail: journe@centre-cired.fr (*)

Dr. Martin Kaplan, an American living in Switzerland, is a former director of research at the World Health Organization and former Secretary-General of Pugwash (1976-88); Pugwash Office, 69 rue de Lausanne, CH-1202 Geneva, Switzerland, Tel. (+41-22) 906-1651, Fax: (+41-22) 731-0194, E-mail: pugwash.geneva@gcsp.ch

Dr. Catherine M. Kelleher is Director of the Aspen Institute Berlin in Germany, and was formerly Senior Fellow in Foreign Policy Studies at the Brookings Institution in Washington, D.C., DASP for Russia, Ukraine, and Eurasia (RUE), International Security Policy, Office of the U.S. Secretary of Defense (1996-1998); Secretary of Defense's Personal Representative in Europe and Defense Advisor to the U.S. Ambassador to NATO, Brussels, Belgium (1994-1996); Faculty Member and Consultant, National War College (1980-1985); Vice Chair, Committee on International Security and Arms Control (CISAC), National Academy of Sciences (1987-1994); Long-term Consultant and Staff Member, National Security Council (1977-1980)

*Office: Aspen Institute Berlin, Inselstrasse 10, 14129 Berlin, Germany, Tel.: (+49-30) 804 8900, Fax: (+49-30) 803-3568, E-mail: AIBCMK@aol.com

Prof. Michiji Konuma is professor and dean at the Faculty of Environmental and Information Studies, Musashi Institute of Technology; professor emeritus at Keio University; president of the Association of Asia Pacific Physical Societies, member of the UNESCO Physics Action Council, and former president of the Physical Society of Japan; Musashi Institute of Technology, Ushikubo 3, Tsuzukiko,

50th Pugwash Conference

Yokohama 224-0015, Japan, Tel. (+81-45) 910-2501, Fax: (+81-45) 910-2502, E-mail: konuma@yc.musashi-tech.ac.jp

Mr. Sverre Lodgaard, a Norwegian political scientist, is director of the Norwegian Institute of International Affairs (NUPI), former director of the United Nations Institute for Disarmament Research in Geneva, and former director of the Peace Research Institute of Oslo; NUPI, Grønlandsleiret 25, POB 8159 DEP, 0033 Oslo 1, Norway, Tel. (+47-22) 177050, Fax: (+47-22) 177015, E-mail: sverre.lodgaard@nupi.no

Luis Masperi is professor of physics at the Centro Atomico Bariloche and Instituto Balseiro of Argentina, former chairman of the Asociacion Fisica Argentina and currently director of the Latin American Center for Physics; Av. Venceslau Braz 71 Fundos, 22290-140 Rio de Janeiro, Brazil, Tel.: (+55 21) 295 5096, Fax: (+55 21) 295 5145, E-mail: masperi@cbrpf.br

Dr. Steven Miller is director of the International Security Program of the Belfer Center for Science and International Affairs at Harvard University's Kennedy School of Government, editor-in-chief of the quarterly, *International Security*, and co-chair of the American Pugwash Committee. Formerly, he was a senior research fellow at the Stockholm International Peace Research Institute (SIPRI), and taught defense and arms control studies in the political science department at the Massachusetts Institute of Technology; CSIA, J.F.Kennedy School of Government, Harvard University, 79 JFK Street, Cambridge, Massachusetts 02138, Tel. (+1-617) 495-1411, Fax: (+1-617) 495-8963, E-mail: Steven_Miller/FS/KSG@ksg.harvard.edu

Prof. Marie Muller is professor of international politics, head of the department of political sciences at the University of Pretoria, and chair of the advisory board of the Institute for Strategic Studies there; Dept. of Political Sciences, Univ. of Pretoria, Pretoria 0002, Gauteng, Republic of South Africa, Tel./Fax: (+27-12) 420-4066/2464, E-mail: mulleme@libarts.up.ac.za

Professor Maciej Nalecz is Director of the International Centre of Biocybernetics of the Polish Academy of Sciences in Warsaw, and a member of the Polish

Academy of Sciences (1967) and the International Academy for Medical and Biological Engineering (1997). He is a foreign member of the Russian (1976) and Georgian (1996) Academy of Sciences. He is the Chairman of Polish National Group and Past Chairman of the Pugwash Council (1974-1997). International Centre of Biocybernetics, Polish Academy of Sciences, ul. Trojdena 4, PL-02109 Warsaw, Poland, Tel (48 22 658-2877), Fax: (48 22 658-2872), email: Maciej.Nalecz@ibib.waw.pl

Dr. Alexander Nikitin is director of the Center for Political and International Studies (CPIS), vice chairman of the Russian Pugwash Committee of Scientists for Disarmament and International Security, professor at the Moscow State Institute for International Relations and at the Russian Academy of Military Sciences, and chair of the section of international relations at the Russian Academy of Political Science; CPIS, Prospect Mira 36, Moscow, Russian Federation 129010, Tel. (+7-095) 280-3536, Fax: (+7-095) 280-0245, E-mail: cpis@orc.ru

Prof. Amnon Pazy is professor of mathematics at the University of Jerusalem and former chairman of the Planning and Budgeting Committee of the Council for Higher Education in Israel; Department of Mathematics, Hebrew University, Jerusalem 91904, Israel, Tel. (+972-2) 658-5127, Fax: (+972-2) 563-0702, E-mail: apazy@math.huji.ac.il

Dr. Sebastian Pease is a physicist and consultant who directed the UK fusion energy programme, and a fellow and former vice president of The Royal Society; The Poplars, West Ilsley, Newbury, Berkshire RG16 0AW, UK, Tel. (+44-1635) 281237, Fax: (+44-1635) 281688

Prof. George Rathjens, Secretary-General of Pugwash, was professor (now emeritus) of political science at the Massachusetts Institute of Technology. He was formerly in the U.S. Departments of Defense and State, in the U.S. Arms Control and Disarmament Agency and on the White House staff; Pugwash Conferences. American Academy of Arts & Sciences, 136 Irving St., Cambridge, MA 02138, USA, Tel. (+1-617) 576-5022, Fax: (+1-617) 576-5050, E-mail: pugwash@amacad.org (*)

Dr. Luiz Pinguelli Rosa is a professor in the Energy Planning Program of the Federal University of Rio de Janeiro (UFRJ), and director of the Graduate School of Engineering (COPPE-UFRJ). A physicist by training, his research activities now lie in nuclear energy and nuclear policy, energy planning and environment, and greenhouse gas emissions; COPPE/UFRJ, Centro de Tecnologia, Bloco G, Sala 101, Cidade Universitária, Ilha do Fundão 21 945-970, Rio de Janeiro, Brazil, Tel. (+55-21) 590-5036, Fax: (+55-21) 290-6626, E-mail: lpr@adc.coppe.ufrj.br

Prof. Joseph Rotblat is emeritus professor of physics at the University of London, former Secretary-General (1957-73) and former President (1988-97) of Pugwash, and a recipient of the 1995 Nobel Prize for Peace; 8 Asmara Road, London NW2 3ST, UK, Tel. (+44-171) 405-6661, Fax: (+44-171) 831-5651, E-mail: pugwash@qmw.ac.uk (*)

Air Commodore Jasjit Singh, AVSM, VrC, VM, is director of the Institute for Defence Studies and Analyses (IDSA) in New Delhi, a visiting lecturer at Defence and War Colleges in India and abroad, and a consultant to the Standing Committee of Defence and Parliament. A former veteran fighter pilot and Director of Operations of the Indian Air Force, he has published extensively on strategic and security issues; IDSA, Block No. 1, Old JNU Campus, New Delhi-110067, India, Tel. (+91-11) 618-6662/7511, Fax: (+91-11) 618-9023, E-mail: postmast@idsa.delnat.ernet.in (*)

Dr. Mark Byung-Moon Suh, a South Korean political scientist, is senior research associate in the division of political science at the Free University of Berlin in Germany, and a visiting scholar (1997-98) at the Modern Asia Center in Budapest, Hungary; Schlieperstr. 12, D-13507 Berlin, Germany, Tel. (+49-30) 433-8574, Fax: (+49-30) 433-2896, E-mail: bmsuh@compuserve.com

(*): Member of Executive Committee

Calendar of Future Pugwash Meetings

18–19 November 2000 Geneva, Switzerland	Pugwash Meeting no. 258: 14 th Workshop of the Pugwash Study Group on the CBW Conventions: <i>Key Issues for the Fifth BWC Review Conference 2001</i>
21–28 January 2001 Andalo (Trento), Italy	ISODARCO Meeting no. 44 14 th Winter Course: <i>From the Caucasus to the Atlas Mountains: Tensions on the Southern Flank of Europe</i>
13–16 February 2001 Havana, Cuba	Pugwash Meeting no. 259: Pugwash Workshop on <i>Biotechnology and Medical Research in Cuba</i>
25–27 March 2001 New Delhi, India	Pugwash Meeting no. 260: Pugwash Workshop on <i>Moving Towards the Abolition of Nuclear Weapons: Strengthening the Political Conditions</i>
3–5 April 2001 Seoul, So. Korea	Pugwash Meeting no. 261: 2 nd Pugwash Workshop on <i>Missile Defenses and Nuclear Stability</i>
26–29 April 2001 Alexandria, Egypt	Pugwash Meeting no. 262: 7 th Pugwash Workshop on the Middle East
4–6 May 2001 Castellón de la Plana, Spain	Pugwash Meeting no. 263: 3 rd Pugwash Workshop on <i>Intervention, Sovereignty and International Security</i>
Spring 2001* Netherlands	Pugwash Meeting: 15 th Workshop of the Pugwash Study Group on the Chemical and Biological Weapons Conventions
Summer 2001 Trento, Italy	ISODARCO Meeting no. 45
6–9 September 2001 Como, Italy	Pugwash Meeting: 4th Pugwash Workshop on <i>Intervention, Sovereignty, and International Security</i>
November 2001* Geneva, Switzerland	Pugwash Meeting: 16 th Workshop of the Pugwash Study Group on the Chemical and Biological Weapons Conventions
10–16 November 2001 Agra, India	Pugwash Meeting: 51st Annual Pugwash Conference: <i>Challenges for Peace in the New Millennium</i>
9–14 August 2002 La Jolla, California	52nd Pugwash (Quinquennial) Conference

* = tentative

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Cambridge Office
American Academy of Arts
and Sciences
136 Irving Street
Cambridge, MA 02138 USA
Tel: (+1-617) 576-5022
Fax: (+1-617) 576-5050
E-mail: pugwash@amacad.org

Geneva Office
WMO/OMM Building
7 bis, Avenue de la Paix
1202 GENEVA, Switzerland
Phone: **41-22-730-8620
Fax: **41-22-730-8625
E-mail: pugwash.geneva@gcsp.ch

London Office
Flat A Museum Mansions
63A Great Russell Street
LONDON WC1B 3BJ, England
Phone: **44-171-4056661
Fax: **44-171-8315651
E-mail: pugwash@qmw.ac.uk

Rome Office
Accademia Nazionale
dei Lincei
via della Lungara, 10
1-00165 ROME, Italy
Phone: **39-06-6872606
Fax: **39-06-6878376
E-mail: pugwash@iol.it