Pugwash

NEWSLETTER

issued by the Council of the Pugwash Conferences on Science and World Affairs
Nobel Peace Prize 1995

Ruth Adams and Joseph Rotblat on the porch at Thinker's Lodge, Pugwash, Nova Scotia, July 2003

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Pugwash

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To the Pugwash Community

Sir Joseph Rotblat

As this issue of the *Pugwash Newsletter* was being readied for publication, we received the very sad news that Jo Rotblat died in London on August 31 at the age of 96. Jo had been in declining health for several months, and was unable to join us in Hiroshima in July for the *55th Pugwash Conference*, the first annual Pugwash conference Jo had ever missed. Although Jo was with us in spirit at the Hiroshima conference, through taped video messages and John Holdren's keynote address in Jo's honor, it was apparent that Pugwash was facing a future without its co-founder, past President, co-Nobel Peace Laureate, and guiding spiritual force. Tributes to the legacy of a remarkable human being have come in from all over the world, and we will devote a substantial portion of the December 2005 issue of the *Newsletter* to Jo and all that he represented in the quest for a more just and peaceful existence for all humankind. Below is the statement released by the Pugwash Council following Jo's death.

In Memory of Sir Joseph Rotblat

A Statement of the Pugwash Council
2 September 2005

The worldwide Pugwash community has lost a friend, mentor and moral touchstone.

Jo Rotblat in so many ways *was* Pugwash, beginning with his organizing efforts for the first international scientific conference in Pugwash, Nova Scotia in 1957, to the 54th Pugwash Conference held in Seoul, South Korea in October 2004 – the last he attended.

For these 47 years, as co-founder, President and Council member, Jo embodied the scientific rigor and ethical conscience of all that the Pugwash movement aspired to in calling on governments and political leaders to rid the world of the menace of nuclear weapons.

Jo's path to opposing nuclear weapons began earlier, of course, when in 1944 he became the only scientist to leave the Manhattan Project and refuse to work further on the atomic bomb once it was clear the Nazis were defeated.

Then, in 1955, he joined Bertrand Russell and Albert Einstein in helping to formulate the seminal Russell-Einstein Manifesto, which became the founding document of the Pugwash Conferences. As the sole surviving signatory of the Manifesto during its 50th anniversary this year, Jo felt compelled to continue to stress its relevance to the nuclear dangers facing us today.

Whatever the political circumstances of the day, and despite criticism from some about his political idealism and naiveté, Jo's message remained steadfast: either the world will eliminate nuclear weapons, or we face the prospect of such weapons eliminating us. The continued presence of such weapons in the arsenals of some countries, and their possible acquisition by terrorist groups, means one thing: as long as such weapons exist, they will some day be used.

Beyond the nuclear menace, however, Jo believed fervently in the goal of eliminating war as a means of settling disputes. Accordingly, the Pugwash Conferences over the years devoted as much effort to bringing together parties in conflict as it did to analyzing the feasibility and desirability of eliminating nuclear weapons. Inspired by Jo, Pugwash has continued to grow, with representation today in more than 50 countries around the world, and with active involvement in precisely those conflict areas where the risk of nuclear weapons use is greatest.

More broadly, his eternal optimism and faith in the fundamental decency of human nature manifested itself in his continuous support for the young generation of Student/Young Pugwash members and recently by the launch of an educational campaign about the danger of nuclear weapons.

As it approaches its 50th anniversary, in 2007, Pugwash will continue to strive for those ideals so wonderfully and eloquently articulated by Jo throughout his lifetime. We may have lost his companionship, humor and intellectual guidance, but we will never lose his steadfast sense of purpose in knowing the right thing to do. Nonetheless, we will miss him, dearly.

55th Pugwash Conference on Science and World Affairs

The December issue will also fully cover the proceedings of the *55th Pugwash Conference on Science and World Affairs* that took place from 22-27 July 2005 in Hiroshima, Japan. More than 160 participants from some 30 countries attended the conference, which was held just weeks before the 60th anniversaries of the atomic bombings of Hiroshima and Nagasaki. The Hiroshima conference was truly a remarkable, and sobering, event, reminding us all of the urgency of efforts to ensure that nuclear weapons are never again used against humanity.

While in Hiroshima, the Pugwash Council began to finalize plans for the *56th Pugwash Conference on Science and World Affairs* that will be held in Cairo, Egypt in November 2006, and more information on that will also be included in the December 2005 issue.

Challenges to the Nuclear Non-Proliferation Regime

In one of the final articles he wrote before his death (reprinted on page 87), Jo warned of the continuing threats posed by nuclear weapons, and also called on delegates to the 7th NPT Review Conference then meeting in New York (see page 82) to heed these dangers and act forcefully to take concrete steps aimed at eliminating nuclear weapons. As printed in the *New York Times* on May 17, 2005, Jo's article recalled the origins of the 1955 Russell-Einstein Manifesto and observed how its 50th anniversary should be a time of serious reflection on how far we have to go to eliminate nuclear weapons and the sources of conflict.

Acknowledgments

Pugwash is grateful to the following organizations for their continued support of the *Pugwash Newsletter*, as well as other Pugwash publications and the Pugwash website: the Italian National Research Council, the German Research Society, the John D. and Catherine T. MacArthur Foundation, and the Cyrus Eaton Foundation.

Pugwash Conferences on Science and World Affairs
1995 NOBEL PEACE PRIZE

54th Pugwash Conference on Science and World Affairs
Bridging a Divided World Through International Cooperation and Disarmament

4–9 October 2004, Seoul, South Korea

Statement of the Pugwash Council 9 October 2004

The Pugwash Council, meeting during the 54th Pugwash Conference held in Seoul, Korea from 5-8 October 2004, expresses its grave concern that the international community faces a critical turning point in the threat to global security posed by nuclear weapons.

The potential collapse of the nuclear non-proliferation regime and the weakening of the taboos in place since 1945 on the use of nuclear weapons, coupled with the very real dangers of a terrorist group manufacturing and detonating a nuclear explosive device, combine to produce a recipe for unmitigated disaster.

Regarding the non-proliferation regime, the upcoming Seventh Review Conference of the Non-Proliferation Treaty—being held in the spring of 2005—faces daunting challenges. The original nuclear weapons states (US, Russia, UK, France and China) have not lived up to their obligations under Article VI of the NPT to move decisively toward the irreversible elimination of their nuclear arsenals. Such inaction invites charges of hypocrisy when these same countries seek to deny access to nuclear technologies to non-nuclear weapons states, or—in the case of the United States—threaten and carry out military pre-emption to prevent the acquisition of nuclear weapons by other countries.

On the Korean peninsula—the site of this year's Pugwash Conference—stability and the relaxation of tension is undermined by continued hostility between the Democratic People's Republic of Korea (DPRK) and the United States and by the continued crisis over the nuclear program of the DPRK. The DPRK's withdrawal from the NPT in early 2003 poses a serious challenge to the non-proliferation regime and must be solved through multilateral negotiation and cooperation as soon as possible.

In the Middle East, Israel's policy of opacity concerning its nuclear weapons program, while meant to avoid embarrassing NPT-parties in the region, does provide arguments to those who advocate nuclear weapons programs in other countries. Israeli policy also provides a justification to those in other countries who oppose the chemical and biological weapons conventions, resulting in a net decrease, in our judgment, of Israel's security. There are also grave uncertainties and concerns with Iran's nuclear intentions that need to be resolved through transparent fulfillment with IAEA obligations. In this volatile region in the world, bold steps are needed to support the proposals for a WMD-free zone in the Middle East as well as such initiatives as the Arab Plan and the Geneva Accord that can bring about effective regional security.

In South Asia, India and Pakistan continue to face each other with nuclear arsenals. Although significant progress has been made in improving relations between the two, there remains the very real possibility of the resumption of open hostility and conflict.

More broadly, the entire framework of nuclear weapons disarmament is in danger of being swept away. Strategic arms control between the US and Russia is moribund, the Comprehensive Test Ban Treaty (CTBT) has not entered into force, and serious negotiations have not even started on a Fissile Material Cut-off Treaty (FMCT) to eliminate production of weapons-grade Highly Enriched Uranium (HEU) and plutonium. Moreover, too little is being done to control and dispose of existing stockpiles of HEU that run the risk of falling into the hands of terrorist groups. No attention is being

paid to large numbers of tactical nuclear weapons that continue to exist in great numbers with no military rationale whatsoever, while the deployment of weapons in space moves closer to reality. Adding fuel to this nuclear fire is the fact that the Bush administration in the US has increased the role of nuclear weapons in US national security policy by its renewed interest in nuclear war-fighting strategies, in possibly developing new nuclear weapons, and in a possible resumption of nuclear testing.

At the same time as little progress is made toward the twin objectives of nuclear disarmament and nuclear non-proliferation, the phenomenon of international terrorism continues to cast a spectre over the international community. The US-led military presence in Iraq has become a source of continued instability and loss of life and a focus for international terrorists. We hope for an early mitigation of this violence and believe that a major step in this direction would be the transfer of authority to a democratically-elected (under UN supervision) and effective Iraqi government. This government should then be provided with all necessary military support by the international community in order to re-establish democratic law and order in Iraq.

At the 54th Pugwash Conference in Seoul, all of these themes were touched on by such speakers as Dr. Mohamed ElBaradei, Director General of the International Atomic Energy Agency; Dr. Hussain Al-Shahristani of Iraq, who was imprisoned by Saddam Hussein for refusing to work on nuclear weapons, and by Nobel Peace Prize Laureates Kim Dae-Jung, former President of South Korea, and Dr. Joseph Rotblat, co-founder and past President of the Pugwash Conferences.

These speakers and others stressed the need to reduce the tensions that undermine global security, whether between nuclear and non-nuclear states, or between those who act unilaterally and those committed to a multilateral international legal order, or between those who continue to rely on the primacy of nuclear weapons for security and those who would reduce the insecurities that stimulate interest in nuclear weapons in the first place. In particular, Dr. Hussain al-Shahristani spoke eloquently from his own experience of the moral imperative of scientists not to work on nuclear weapons and other instruments of indiscriminate destruction.

Time is running out if a nuclear catastrophe is to be averted. Political solutions are urgently needed to resolve those conflicts that either spawn international terrorism, or increase the risk of nuclear weapons use, or both. Global security must be based on international institutions and the rule of law rather than on unilateral action and an excessive reliance on military force.

In looking ahead to the 2005 NPT Review Conference, the Pugwash Council calls on national governments, multilateral institutions, and international NGOs to lead the international community away from a misplaced reliance on nuclear weapons and the catastrophic dangers that await us if clear progress is not made to decisively reduce and eventually eliminate nuclear weapons.

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54th Pugwash Conference Participants.

54th Pugwash Conference on Science and World Affairs

Bridging a Divided World Through International Cooperation and Disarmament

4–9 October 2004, Seoul, South Korea

Conference Schedule

TUESDAY 5 OCTOBER

10:00–11:00	**Opening Plenary Session**
	Chair: Pan Zhenqiang (Member, Pugwash Council)
Welcome	Park Seh-Jik, Chair, Organizing Committee
Keynote	Kim Dae Jung, former President, ROK
Response	Joseph Rotblat, Pugwash President Emeritus
11:30–13:00	**Plenary Session 1: Report of the Pugwash Secretary General**
	Chair: Marie Muller (Chair, Pugwash Council)
	Prof. Paolo Cotta-Ramusino (Italy), Secretary General
13:00	Lunch
14:30–16:00	**Plenary Session 2: The Elimination of WMD—The Way Ahead**
	Chair: Douglas Roche, former Senator, Canada, and member of Pugwash Council
	Amb. Sergio Duarte (Brazil), President-Designate, 2005 NPT Review Conf.
	Randy Rydell (US), Office of Under-Secretary for Disarmament, United Nations
	Amb. Henrik Salander (Sweden), Executive Director, WMD Commission,
	Dr. Christopher Chyba (US), Stanford University
19:30	**Dinner hosted by the Minister of Reunification, Chung Dong-Young**

WEDNESDAY 6 OCTOBER 2004

9:00–10:30	**Working Groups Meet**
11:00–12:30	**Plenary Session 3: Nuclear Weapons and the NPT**
	Chair: Dr. Jeffrey Boutwell, Executive Director, Pugwash
Address	Dr. Mohamed ElBaradei, Director General, IAEA
Response	Amb. Sergio Duarte (Brazil)
12:30–14:00	Lunch
14:00–16:00	**Plenary Session 4: Security in Northeast Asia**
	Chair: Hwang Won-Tak, South Korea,
	Moon Chung-in (Korea), Modern Korea Studies Institute
	Dr. Ralph Cossa (US), Asia-Pacific Forum
	Gen. Pan Zhenqiang (China), Member of Pugwash Council
16:30–18:00	**Working Groups Meet**
19:30	**Dinner hosted by Deputy Minister for Foreign Affairs**

THURSDAY 7 OCTOBER 2004

9:00–11:00	**Plenary Session 5: Consequences of the Iraq War**
	Chair: Prof. Paolo Cotta-Ramusino (Italy), Secretary General, Pugwash
	Dr. Abbas Al-Hussaini (Iraq), University of Westminster, London, UK
	Dr. Steve Miller (US), Harvard University, Cambridge, USA
	Mahmood Vaezi (Iran), Institute of Strategic Studies, Tehran
	Dr. Samir Al-Taqi (Syria), Institute of Security Studies, Damascus
11:00–11:30	Coffee Break
11:30–13:00	**Plenary Session 6: Dorothy Hodgkin Memorial Lecture**
	Chair: Prof. Saideh Lotfian (Iran), Member of Pugwash Council
	Dr. Hussain Al-Shahristani (Iraq), Iraqi National Academy of Science
13:00	Lunch
14:30–16:30	**Working Groups Meet**
17:00–18:00	**Working Groups Meet**
19:00	**Dinner Hosted by the Mayor of Seoul, Lee Myung-Pak**

FRIDAY 8 OCTOBER 2004

9:00–11:00	**Plenary Session 7: Presentation of Working Group Reports**
	Chair: Miguel Marin-Bosch (Mexico), Member of Pugwash Council
11:30–12:30	**Plenary Session 8: Presentation of Working Group Reports**
	Chair: Prof. Marie Muller (South Africa), Chair of Pugwash Council
12:30–13:00	**Concluding Remarks:** Paolo Cotta-Ramusino, Secretary General, and Jeffrey Boutwell, Executive Director
13:00	Conference Adjourns

54th Pugwash Conference on Science and World Affairs
Bridging a Divided World Through International Cooperation and Disarmament
5–8 October 2004, Seoul, South Korea

Report on Working Group 1
Eliminating Nuclear Weapons

Sverre Lodgaard, Miguel Marin Bosch, Co-Conveners
Masako Ikegami (Sweden/Japan), Rapporteur

The NPT regime is in a critical crisis, on the verge of institutional breakdown. The actual use of nuclear weapons seems to be a question of when rather than if. With this sense of keen urgency, the Working Group One discussed four agenda: (1) Nuclear disarmament and non-proliferation, (2) Horizontal nuclear proliferation and non-compliance problems, (3) Regional issues (North Korea and South Asia), and (4) Pugwash profile.

1. Nuclear Disarmament and Non-Proliferation

Following factors were identified as major causes of eroding the Nuclear Non-Proliferation Treaty (NPT):

• Nuclear Weapon States (NWS)' failure to comply with Article VI which calls for good faith negotiations toward nuclear disarmament. The United States and Russia maintain huge arsenals of nuclear weapons in violation of the spirit. NWSs are not committed to legally binding negative security guarantee vis-à-vis non-NWSs, which reduces the legitimacy of the NPT regime. Without NWS's serious commitment for nuclear disarmament of the Article VI, the NPT lacks legitimacy and validity. Disarmament and non-proliferation are two sides of a coin, and have to be addressed simultaneously. Pugwash should urge the non-nuclear states of NATO to join Canada in supporting the New Agenda's resolution at the United Nation's 3rd Committee, and thus strengthen the center ('Moderate Middle') of the nuclear weapons debate. Pugwash should support the Middle Powers' Initiative in its work to energize a global dialogue on nuclear weapon and build bridges between middle power countries to work together.

• Deeply rooted adherence to nuclear weapons, not only by isolated states suffering from the sense of insecurity, but even by NATO Europe as a 'credible means of military capability'. The United States forward deploys 480 non-strategic nuclear bombs in Europe and is the only country that currently deploys nuclear weapons outside of its borders. Foremost Russia, but also the United States and probably China maintain significant stocks of non-strategic nuclear arsenals. Pugwash could make a significant contribution by pressing for removal and destruction of non-strategic nuclear weapons as an agenda item for the 2005 NPT Review Conference.

• The continued deployment of thousands of nuclear warheads on alert by the United States and Russia, two countries that are no longer enemies, serves only to increase the risk of their accidental use. Pugwash should call for the de-alerting of the U.S. and Russian operationally deployed nuclear weapons.

• Highly enriched uranium (HEU) is more plentiful, more dispersed, easier to use and fabricate into a weapon and more difficult to detect than plu-

tonium. Excessive HEU increase the potential that terrorist could acquire a nuclear weapon or fissile material to fabricate a nuclear explode device. Pugwash should call for elimination of excessive HEU and to rapidly consolidate, secure and eliminate military stocks of HEU. Pugwash should also seek ways to resolve impediments that have prevented universal adoption of a Fissile Material Cut-off Treaty (FMCT).

• Whether the comprehensive nuclear test ban treaty (CTBT) will enter into force is another major concern for the future course of nuclear disarmament. The greatest threat is the failure of the United States to ratify the CTBT and the risk that the United States will resume nuclear testing to certify the reliability of deployed warheads or new designs, e.g., low–yield weapons or new earth penetrating nuclear warheads.

2. Horizontal Nuclear Proliferation and Non-Compliance Problem

• Integration of the NPT is seriously challenged by North Korea's violation of and withdrawal from the treaty, and the secret development of a gas centrifuge uranium enrichment capability by Iran in violation of its IAEA safeguards agreement. Yet to be explored is how to deal with a case of non-compliance within the NPT and the UN Security Council (UNSC) framework. In the 1994 Agreed Framework, the US-North Korea bilateral agreement superseded the NPT.

• Enrichment and reprocessing of nuclear fuel by certain non-NWSs is another concern. The NPT Article IV stipulates no limit in civil use of nuclear technology, and the NWSs cannot claim the monopoly of nuclear enrichment without legally binding guarantee of providing nuclear fuels to non-NWSs. Discriminative approach causes much distrust among developing countries, stimulating their incentives for more self-reliance. Prudent measures are needed to balance the NPT Article IV and ensuring peaceful use of nuclear fuels. Pugwash could make significant contribution by supporting the IAEA's efforts to achieve universal adherence to the Additional Protocol, by closing existing safeguards loopholes and encouraging the UN Security Council to take appropriate steps to enforce the NPT/IAEA safeguards requirements.

• Pakistani nuclear scientist, A. Q. Khan's confession has disclosed a global syndicate of nuclear weapon-related technologies and materials. Contrary to the industrialized countries' erroneous perception that they monopolize advanced technology, such technology is now widely available. A.Q. Khan's incident implies that global complex of nuclear weapon-related technologies are, just like the case of drug- or human trafficking, hard to be tackled by conventional state-based institutions. New institutions are yet to be created to meet increasingly globalized nature of the proliferation issue. The control capacity of state-based institutions is limited. A complementary approach may be to encourage the industry and individual's voluntary compliance with the international framework of controlling sensitive technologies (code of conduct) by information-spreading and providing incentives.

For tackling with the proliferation issue, more credible and effective export control is necessary. The supply side's approach is not sufficient and the demand's side's issue is to be more addressed. The UNSC Resolution 1540 has urged a rule of technology export control, but it only deals with state-based actors, and may not be sufficient to deal with non-state actors such as A.Q. Khan's global nuclear network. Also the export control regime needs more dialogue between developed and developing countries.

3. Regional Issues (North Korea, India, Pakistan, Israel)

• North Korea's alleged HEU program stalemates the 6-party talks. More clarification of N. Korea's HEU program is necessary, and with this regard, the Pugwash could propose to send Pugwash scientists to North Korea. Consequences of North Korea's violation of the NPT have serious international implications. The 1994 Agreed Framework was destined to fail, because it did not address North Korea's sever sense of insecurity, but only providing economic compensation. North Korea's serious violation of the NPT jeopardizes its future. At the same time, peaceful resolution of the nuclear crisis may not be possible without restoration of the NPT regime, particularly regarding Article VI and NWS's negative security guarantee. Pugwash should call for peaceful resolution of North Korean nuclear crisis and support six-party talks, in the understanding that the nuclear crisis is linked to the future of the NPT. How the 6-party talks and IAEA/NPT can co-work in a complementary way, is an open question.

• In India, majority of the public and elites are comfortable with nuclear weapons, and even the recently revitalized India-Pakistan peace talks do not deal with their nuclear arsenals, never mentioning about mutual inspection of nuclear sites. If the current status continues, both of the countries will deploy 100-150 nuclear weapons in a few years to possess excessive nuclear weapon capacity. Thus, 'capping of nuclear arsenals' is critical in South Asia, if not disarmament, as a valid and feasible approach. India does not have to compete with China on nuclear weapon capability. FMCT may also well agreed upon in South Asia. A serious challenge for the NPT is again a double standard; while violation by NPT members such as Iran and North Korea are severely accused, there is virtually no limitation or constraint on Indian and Pakistani nuclear weapons. Such double structure erodes the NPT regime. De-nuclearization of short-range ballistic missiles deployed along the India-Pak border, combined with conventional forces reduction, may facilitate 'capping' of South Asian nuclear weapons. In a regional context, intertwined correlation between conventional forces and nuclear weapons is a key to understand the mechanism of nuclear proliferation; both North Korea and Pakistan developed nuclear weapons to make up their inferior conventional forces.

• Engaging non-NPT nuclear weapon states: Different from all the parties of the NPT, Israel, India and Pakistan are under no legal obligation to (1) refrain from assists others in acquiring nuclear weapons; (2) abide by the rules of international nuclear commerce; and (3) work for nuclear disarmament. This is an untenable solution. The recognition of a black market in sensitive nuclear technologies has highlighted the need to draw all states into the non-proliferation regime. To broaden the coverage of the regime, the states might be asked to behave 'as if' they were parties to the NPT. This could take the form of unilateral adherence to an additional protocol to the treaty. There are a number of other ways, not implying recognition of India and Pakistan as NWSs, toward the same objective. A debate is needed to explore the options, clarifying their feasibility, and remove the inertia that surrounds these issues. Call on 'holdouts' to accede to the NPT as NWSs has led nowhere.

4. Pugwash Nuclear Disarmament Profile: Suggestions for 2005 Hiroshima Conference & NPT Review Conference

• To raise the visibility of the dangers of nuclear weapons and promote understanding that the possession of nuclear weapons is immoral; Efforts to de-legitimize nuclear weapons; To call for minute of silence in every country in memory of Hiroshima and Nagasaki victims.

• Nuclear disarmament should seek the physical elimination of nuclear weapons in a transparent, verifiable and irreversible way; To promote a declaration of existing fissile material nuclear-weapon stocks; To explore possible verification technologies and schemes for a global nuclear disarmament treaty; To call for elimination of excessive HEU.

• To call for the non-first use of nuclear weapons and the de-alerting nuclear weapons

• To call for the withdrawal of extra-territorial nuclear weapons and a review of present military doctrines which incorporate nuclear weapons; elimination of tactical nukes.

• To support the establishment of NWFZ/WMD-Free-Zones in the Middle East and nuclear test moratorium; to oppose weaponization of space; To call for the CTBT to enter into force.

• With regard to the New Agenda Coalition toward the 2005 NPT Review conference, energize middle powers through new partnership for cooperative efforts to stop erosion of the NPT, urging the NWSs to comply with Article VI.

Concluding Remarks

The NPT regime is in crisis. Its essential double structure has eroded the legitimacy of the regime, reaching the point of system-breakdown. The lack of legitimacy has evoked resistance from dissatisfied countries such as Iran and North Korea in the form of non-compliance and expansion of clandestine nuclear weapon technology network. Imposition of the rules by the privileged NWSs led by the United States is not a valid measure to address this system crisis. The NPT could be saved only by restoring it as an institution for mutual security guarantee: i.e. the NPT non-nuclear weapon states are to be better secured than non-NPT member states with nuclear weapons. Serious commitment for nuclear disarmament in tandem with strengthened non-proliferation measures is an essential key to save the NPT. Otherwise in theory, the future nuclear anarchy may not be excluded.

Report on Working Group 2
Building Cooperative Security: the Case of the Middle East

Paolo Cotta-Ramusino, Steve Miller, Co-Conveners
Hugo Estrella, Rapporteur

Our group began by discussing the way threats to peace and security are perceived by the people from the participants' countries.

The first concern expressed was about the consequences of the American presence in Iraq. The current events there are sending signals to the whole region and the consequences and side effects of the war have an impact for the security of each nation. An aggressive American policy is viewed by some as implying consequences in the short and the longer run.

There is, for instance, consistent support as it was clear in the beginning of the conflict, to the proclaimed goals of:

- disarming a country that had a proven record of aggression towards others.
- stopping terrorism that, backed by the Hussein's regime, was attacking neighbouring countries .
- removal of Saddam and regime change. This last also made other countries' leadership fearful that it might set a precedent to be repeated in other situations.
- Strengthening democracy. The promotion of a more democratic region is welcomed by people who are going through democratization processes, and also as a cooperation for peacebuilding. Democratic administrations are seen as more eager to peacefully solve their differences with other democracies.

Disagreement and fear appear at confronting what is regarded as a lack of understanding from the US side to the expectations and ways of relating of the local people in relation with the Western model. It is hard to extrapolate today's Western Democratic systems to other realities. Therefore, a sense of having a regime imposed on people is capable of generating more rejection than support. There was also concern for the pretension of controlling the oil reserves in the long run, thus making systems more unstable due to the fear of invasion. Moreover, some terrorist groups that were being disarmed and dismantled in a first phase, are now seemingly gaining strength despite the Iraqi administration and the coalition troops' statements. This poses a direct danger to the neighbours.

A capital point for instability is the lack of chances for dialogue. Some countries feel threatened, or even actually are, by others. But there is lack of channels for expressing concern and discuss solutions, so the threat is perceived as even bigger than what it may actually be. And this tends to make insecurity grow instead of moving towards a solution.

The different standards applied by the US are also a concern for Arab countries. There have been signals that there must be changes urgently done at the domestic level. The post 9/11 World shows a determination from the US administration not to tolerate the previous state of affairs and is directly requesting an active role in dismantling organizations considered as terrorist. But this is also hard to do, because national governments are being in some cases caught between confronting parties that have little to do with their own decision-making capacity. The mistakes done in Iraq are also triggering internal unrest, and making it hard to keep stability. The case of self determination in Iraq, which is a generally expressed aspiration, has to be better defined in certain cases. It may imply not just following the national boundaries, but the aspirations of people that live across those boundaries and also of those who are overcoming a conflict. Foreign actors may well help in gaining understanding

Paolo Cotta-Ramusino, flanked by Kim Dae Jung and Joseph Rotblat.

and establishing measures of the progress being achieved as such changes take place.

The case of Israel is seen in a dual role, for some it places instability, whilst for others it's a power that requires a proper balance. If it is to be balanced, then they pursue an upgrading in their own forces in order to counter such military might. But Israel is also seen as the privileged partner of the US and the only capable of influencing the US policy for the whole Middle East.

For Israel, on the other hand, that same perception is what makes them insecure. They rely on themselves for defending their country, and despite the relation with the US, feel that nobody is going to do what they have to do in order to achieve security. In case of cooperation with the other countries from the region, they would be a good partner in terms of using their long standing dialogue with the US at delivering the message other countries are not feeling able to.

But the overall situation shows that US is aiming for a radical reshape of the Middle East system in order to change it into something more compatible with North American interests. They want first friendly regimes, and hopefully democracies. The past role played by the US in supporting regimes far from democratic makes people skeptic about that statement. There has also been expressed a concern for the lack of other basic aspects that foster Human Security, and they are in the basis of democratic change and national stability.

Democracy in Iraq

Iraqis are hoping to move towards democracy, and the first step is the need for elections to be held as scheduled in early 2005. But at the same time, those elections are seen as the turning point in their future stability. If carried on solely by the present administration, they will probably not be accepted and may trigger instability and domestic fight. If they are carried on with a strong support and presence from the UN and support from the US, as well as with the good will of the regional organizations, then the chances for success are major. Many people who have the will to take part in the building of Iraqi democracy have been avoiding participating because they fear lack of fair play. They welcomed the end of Saddam Hussein's regime, but did not find a chance to continue an active involvement under the occupation and growing violence.

Elections are going to bring to the Assembly all parts involved in Iraqi citizenry, and it is to be hoped that free and fair elections will help build confidence between them. Also, other actors have to stay out of the process. Today's Iraq shows a multiplicity of interests that have become growingly violent in some cases. The concern for an unstable Iraq has attracted other countries to play a role that diminishes the chances for peace. If they respect the electoral process and the decisions and commitments made at an assembly, Iraq may well become a peaceful country. But there is also a need from the West to respect the way Iraqis chose for themselves to be organized. And the type of democracy they want to establish. It may not be a western type, but in the long run it may develop into something similar. Basically Iraqis want to live their way, and fear what may happen if the result of elections does not seem to match the interests of the Coalition.

In any case, today's terror is a result of postponing the institutionalization of Iraq, not a cause for it. A government regarded as legitimate by Iraqi people will be defended and strong. It will have the legitimacy to control and combat terrorist groups, as it is happening today at the local level. The national administration does not seem to be efficient at controlling terrorists, while local people feel the need to defend themselves from both sides, and they do. So hopes for a democratic stable Iraq are high if elections are held on time and under international guarantees. The UN so far is in desperate need of support to accomplish such a task. Calling upon the SHIRBRIG (Multinational Standby Force High Readiness Brigade For UN Operations) headquartered in Denmark is probably the best way to supply personnel to carry on such task.

The nuclear problem

Iran considers itself in full compliance with the provisions of international law and the IAEA missions are welcome. Their case is also seen a source of instability for their neighbors, who fear a situation like one in Iraq may be replicated. Iran wishes to possess nuclear technology and at the same time advance in a positive dialogue with the US. This may help in getting to a commitment that ensures the continuity of the Iranian government and some base for future cooperation with the US.

On the other hand, what happened with the Osirak reactor made other countries aware of the need for building separate compounds in order to prevent the destruction in a single attack. To prevent such attack Iran claims to have the will for opening all their facilities for inspection.

Israel, on turn, having nuclear military capability poses a threat to other nations in the Region, and they feel that if they gain some nuclear capacity they will prevent an attack. The five nuclear powers have a record in not attacking countries that have nuclear capabilities. So possessing nuclear technology make other nations feel safer. Some consider Iran's government as eager to harbor terrorists, and it would be a reason for the West to be concerned if there are not safeguards of a change of attitude in that respect.

The Israeli /Palestinian situation

The decision by the government of Ariel Sharon to unilaterally withdraw from Gaza is a major move for Israeli domestic policy. The clash with groups of settlers claiming for their right to stay is viewed as the major domestic fight Israel has to face in the quest for Peace. This power struggle, if successful to the government, will open the gate for a future support for the peace process. Withdrawing unilaterally was a decision claimed to be taken as a need for concrete steps towards the solution of the problem, and also claimed as a result of the lack of a partner from the Palestinian side. Israeli officials think that this decision will call upon Palestinian leadership to take their responsibility on running Gaza, and therefore forcing them to move towards the establishment of a government capable of running the place. Some Israeli Peace advocates support the withdrawal because the dismantlement of settlements will help to overcome a major obstacle for the Two State Solution, as requested by the UN and agreed in Oslo.

Palestinians are skeptical of their prospects to run a place that for some is considered as a trap, with not many chances for independent decision-making. It lacks, for instance, basic resources under their control. They range from water supplies to freedom of movement. And they also fear that this is going to trigger more conflicts in the West Bank. Israeli government, on the contrary, claims that as Gaza has clear borders it is easy to move out from it, and it will open the gate for the withdrawal from the West Bank. In this case, the government of Israel says, borders are subject to further negotiation and to be agreed upon. The case of Gaza is to be understood, according to Israeli claims, as the beginning of a process and not the end of it.

Both parts consider that reliable Third parties could be welcome to co-operate in the effort to establish conditions for dialogue, after so many years of Intifada, retaliation and lack of mutual trust. Egypt is seen as a necessary partner, because of the proximity to Gaza and because its the only nation capable to safeguard the Philadelphia corridor. But other cooperating parties may also be welcomed. Non-governmental actors, like Pugwash, could play an important role in setting up the conditions for dialogue and to help bringing about a reliable partner in Peace.

The initiative of the Arab League is a major shift in Middle East policy, because entitles the acceptance of the Two State solution by the Arab states. It is considered as very general, and the particulars are still to be discussed. The Syrian position accepting the provisions of the proposal is a major change. For Israelis a similar attitude from Iran would be needed. While Iran says that it's to the Palestinians to make the decision, and they will respect whatever compromise is made.

The case of the Geneva accords, on the contrary, seem not to be accepted by large numbers of the Israeli public opinion, but is a good step forward in trying to reestablish negotiations. It is not the representation of states but the will of participating individuals. If the accords are revived, they can provide the particulars that are missing in the Arab League's proposal. The failure of the Road Map, on the other hand, is a shared responsibility, and it proves the need for leadership and trust. There was agreement in the group that trust can only be rebuilt with the intervention of a Third Party, as stated above. Europe, despite its past errors, may be today a party beyond the suspicion that the US poses for some Palestinians.

Weapons of Mass Destruction Free Zone

The commitment to bring about a WMDFZ in the Middle East is a long time aspiration. Despite the fact that nuclear weapons are not willing to be discussed so far, some advances have been made in the case of Chemical and Biological weapons, and countries that before were reluctant to accept their possession, today seem to be willing to admit their possession and destroy their arsenals. It would be a major step forward if the five states that have not yet ratified the relevant conventions consider doing so.

In any case an agreement from the 5 Nuclear States is needed. A complete reconsideration of all the nuclear weapons deployed in the Region could be a major step forward.

Report on Working Group 3
International Terrorism and Consequences of the "War on Terror"

Talat Masood and Gabi Baramki, Co-Conveners
Thomas Johansson, Rapporteur

Introduction

Terrorism in the form of 9/11 and since, has seriously destabilized the international community and regions of the world. The consequent war on terror has further deteriorated the situation and made enemies out of old friends. A new front has opened between the Muslim world and western countries. Working group no 3 tried to analyze why this happens, how the events and actors are interconnected and how we could break the vicious circle.

This report is divided into seven sections. In the first we look at definitions. In the second the motives of terrorism are explored. Third, the scope and magnitude of terrorism is looked at. In the fourth, WMD-terrorism is discussed. Fifth, responses to terrorism are suggested. In the sixth section responses to the US administration are discussed. In the last section the discussion on the situation in the Middle East is summarized.

On definitions

The discussion started on the nature of terrorism.

One definition that was given was: "A terrorist *targets* non-combatant *civilians* to achieve a political goal. Those who undertake political actions that target civilians are terrorists." The key words seem to be "civilians" and "violence". It was further stated that "…Terrorism is a result of a failed politics or failed democracy".

Someone else preferred not to label the actor but instead look at the approach each actor takes, a *confrontational* or *accommodational*, to a specific adversary. This way *violence* comes in focus as the destructive factor in any relation (no matter who is the actor).

It was also stated that terrorists using the pretext of Islamism cause should be regarded as political activists – not terrorists.

The discussion further focused around dichotomies such as state actors vs non-state actors, legitimate vs illegitimate violence and national vs international terrorism.

On the origins of terrorism (root causes/ rationale behind it)

Motivations for terrorists vary a lot and can be divided into three categories:

- Psychological – i.e. terrorism for personal reasons (hate, desire for power)
- Ideological – which encompasses religion or philosophies and programs.
- Strategic – the logical result of a group's objectives – as the best means of achieving a specific objective.

In addition, it was stressed that terrorism is in many ways the result of a circular interdependence where different processes act and react to each other. One model that was presented uses the metaphor of a (biological) reciprocal system where signals initiate reactions from each side (when describing the relationship between state and non-state actors). State terrorism was raised especially as more serious and a more important problem to tackle in the field of terrorism.

One question that was posed was: where does this circle begin and consequently where does the chain of events originate? A further question was, what form do these signals take – i.e. what do they consist of ? If media (i.e. reports/coverage) constitutes one signal – is it then media we should be focusing on ?[1] (What is the role of the media when it comes to initiating actions ?). Can we identify other "signals" ?

The scope and magnitude of terrorism today

Some consider that new(-style) terrorism is replacing old(-style) terrorism; hierarchical groups with traditional modus operandi are being replaced by loose networks financed by private sources (including transnational ones) rather than states.

A number of trends were identified as being at work among *domestic* terrorist groups. Those were trends…

- towards huge bomb attacks on city centers
- towards mass-lethality attacks
- towards attacks designed to inflict massive damage on national economics
- of hostage-taking
- of a more extensive and closer collaboration between political groups and international organized crime

The following *international* trends were mentioned:

- an upsurge in the number and severity of ethnic and ethno-religious conflicts…

- the emergence and consolidation of terrorist-groups wholly or in part motivated by religious fanaticism

In the future the international community will probably be faced with a mixture of different actors "new" as well as "old". Some of the trends referred to above prove to be more long-term, while others disappear.

Exactly what the future holds is difficult to say – but that terrorism is and will remain a serious, and perhaps the most serious, threat to world security seem fairly certain.

WMD-terrorism

WMD in the hands of terrorists would be catastrophic. Luckily it is difficult both to acquire ready-made weapons and to put together by a small group of people.[2] Lot of resources has been spent on detection-equipments along borders, on airports, etc all over the world – to detect and contain quickly. Still there are large gaps in this security-net and the costs measured in lives as well as economics would be tremendous in a case of an attack.

There are though certain factors that might refrain terrorists from acquiring and using WMD;

- conventional weapons are more available
- the risk for the user is substantial
- the risk of a public backlash
- the risk of security crackdown that might eradicate the organization

There are also factors that speak for WMD-terrorism;

- one is that irrational actors might value mass destruction more than the negative consequences
- another is the enormous damage on economy
- also it would fit with the trend towards mass-lethality attacks

One view that was presented was that we should focus our attention on the *most probable* scenario (i.e. our focus should be shifted away from the worst case scenario). Thus WMD-terrorism, for example is a major threat but it is not very probable. The difficulties and risks mentioned above together with the tight security around stockpile, agents and other vital resources all add to this. Against this, it was pointed out that the consequences are so enormous and so are the risks. They cannot be ignored. It would be irresponsible not to look at the risk probability.

Responding to terrorism (counter-terrorism)

How do we deal with terrorism? It was suggested that there are many pathways away from terrorism: It was agreed though that:

First we need to avoid seeing terrorism as something associated with the Muslim world as such (and the Muslim world is not one cohesive unit either!). However it is true that most non-state acts of terror presently originate from groups within the "Muslim world". Why is this the case ?

- The Governments are not representative in these countries
- Conflict situations where Muslims regard themselves as being particularly vulnerable are found in these parts of the world (Chechnya, the Middle East, India-Pakistan, etc).

Second the outspoken goal of the USA of regime change also in Iran and Syria needs to be reversed. This policy creates insecurity, hostility and destabilizes the region further.

Thirdly, it has to be recognized that the use of military force has to be used with great discretion to break terrorism otherwise it can prove counterproductive. The policy of fighting terror militarily has had only very limited successes, because it largely fails to address *the root causes*. Terror that largely reflects prevailing social, political and economic circumstances can only be fought on those same terrains, and not primarily in the military arena.

Fourthly, to create a safer world for the future we need to make it *more just*. It is important to note that perceived deprivation of civil and political rights can be far more of a danger to stability than purely material deprivation. Respect for international human rights and international law will foster citizens in all states, religions and groupings to promote democratic values. Through this minority-rights will be respected and motives for terrorism will weaken and so would the public support.

During the discussion it increasingly emerged that democracy as a system, but also as a method, is the best way of countering the causes of terrorism, as well as its consequences. We must be able to handle the problem of terrorism within the borders of democracy. By ensuring that the interests of minority groups are taken into account, that human rights are protected for all people, and by countering terrorist violence with an interest in its origins, we can stop the signals to the non-state actors. It is, however, more difficult to stop the signals from state actors. Participants pointed out though that terrorism from non-state actors springs from terrorism from state actors.

Fifthly, in order to avoid getting stuck in the pessimistic vision of

world war and disaster we need the political will to make priorities that are based on low probability and great costs such as with WMD-terrorism. For this to happen *we* must be able to show decision-makers the magnitude of the risk and consequences in case of the prevailing international politics.

Sixthly, today there are no rules that govern the relationship between war (war on terrorism) and between states and terrorists. The gray zone that exists is freely exploited, e.g., by the USA and the UK who then fail to accept (responsibility of) the outcome. We need rules that govern this situation.

Responding to US policy

It was agreed that:

- The war on terror is wrong and counterproductive: Violence can never solve the problems. It will only further aggravate. The US administration needs to understand that it is against its own security interests.
- To confront the US administration on this will not change the situation. We need to approach in a different way; An imminent dialogue is needed that focuses on American security interests and their position as world power.
- Moral errors. We should make the US administration aware of these errors.
- In order to convince the US administration to take part we need to improve the international system. UN weaknesses and limitations have to be acknowledged. Today the US administration hesitates understandably to take part in a system that can not take care of Rwanda, Sudan, the Balkans, etc .
- The discussions returned time and again to the US war on terror and its ethnocentric foreign policy as a direct cause of and not just an aggravating factor to the situation today, but also as an independent "breeding ground" for future terrorism. A new Administration was not perceived to have the ability to change the current US foreign policy. It was suggested that the only way of changing this is to seek an imminent dialogue with the US administration, based on American security needs. Furthermore, it would be constructive to seek to influence the prevalent view in the US administration that a restriction of liberty is counterproductive (since the shortcomings in connection with 9/11 were associated with shortcomings in the intelligence and security bodies rather than shortcomings in the open society).

The situation in the Middle East

Terrorism as well as security takes different shapes in different regions. The Middle East has seen terrorism for many years. Here as well as everywhere else both form and scope changed after 9/11. 4 years ago a normalization process was under way between USA and Iran. Today suspicion and propaganda stand between them. In Iran as well as other countries in the region people worry that they will be next on the list after Iraq. The US administration at the same time feel threatened by Iranian nuclear aspirations and seem frustrated by Iran because they cannot succeed in Iraq. Israel tends at the same time to slash out in a similar way, unable to understand the counterproductive consequences from using violence. All this feed the negative spiral of more violence and new terrorism. The risk of this terrorism spreading outside the region is seen as clear and present. The reciprocal signals that were mentioned above are easily seen in this region in forms of propaganda, provocations and arrogance. Ultimately day-to-day violence works as the most effective signal. State violence leads the smaller actor into frustration, despair and hopelessness. The perfect feeding-ground for terrorism. Most of the motives in the first section above are there. Consequently terrorism kills and spreads terror among civilians. To break this spiral the state actor has to initiate alternative approaches. Democratic means would halt the violence and slowly take away the motives for further terrorism.

In the case of Israel and Palestine the only solution to end the spiral would be to end the occupation and create an independent Palestinian state side by side with Israel. For Iran and Syria (and maybe others) USA needs to quiet the war-drums and convince that there will be no more violent regime changes in the region. Could others than the USA change the situation ? The answer to this is no. Support would be useful from the EU. It is mainly the US administration that needs to act though.

To initiate this process it was strongly suggested that we condemn the suicide bombings and other terrorist acts in the region.

[1] For example the role and responsibility of Al Jazeera.

[2] It is though far from impossible for someone with the knowledge and right equipment to put together and explode a nuclear device. When it comes to biological weapons it is much more difficult to spread to affect a larger population.

Report on Working Group 4
Economic Cooperation and Security in East Asia

Ambassador Yang Chengxu and
Professor Heung-Soo Park, Co-Conveners
Donald G. Gross, Rapporteur

Introduction and working group focus

The working group agreed that the East Asia region is a place of great economic opportunity and promise that has already become an engine for world economic growth. In the context of rapidly increasing trade and investment, countries in the region have successfully strengthened their diplomatic cooperation on economic issues since the Asia financial crisis of 1997-98.

Against this positive background, however, countries still possess deep suspicions of each other's strategic intentions, giving rise to fears of future confrontation. How to provide security assurances to the Democratic Peoples Republic of Korea (DPRK) and end the DPRK's program to develop nuclear weapons is of greatest concern to countries in the region because this issue could result either in a highly destructive military conflict or trigger a nuclear arms race.

Working group members believed that the current six-party talks on the DPRK's nuclear program cannot be allowed to fail. Settlement of the nuclear issue will permit the parties to address other regional security concerns over time and facilitate stronger economic cooperation as well as greater economic prosperity.

Economic progress and cooperation

The working group reviewed various measures of economic progress in the region during the last several years. They recognized that:

- The trade between China and ASEAN countries has grown annually by approximately 20% since the late 1980s. In 2004, trade among these countries is expected to surpass $100 billion for the first time.
- In 2003, the volume of trade between China and Japan reached more than $133 billion, an increase of 33% over the previous year. For the first half of 2004, the trade volume of more than $92 billion between China and Japan exceeded trade between Japan and the United States. China has now become the largest trade partner of Japan and Japan is China's leading trade partner.
- For the first half of 2004, trade volume between South Korea and China exceeded $43 billion, and China became South Korea's largest trade partner.

This statistical data reflects the economic vitality of East Asia in producing wealth and prosperity that will significantly raise the standard of living of people in the region. The data also highlights the mutually beneficial economic diplomacy that has occurred since the Asia financial crisis of 1997-98.

Among the most promising recent developments are the signing of the 2002 Framework Agreement on China-ASEAN Comprehensive Economic Cooperation and the 2003 Joint Declaration on the Promotion of Tripartite Cooperation by China, Japan and South Korea. Each of these agreements advances trade liberalization in East Asia and strengthens the process of so-called "10 + 3" cooperation among the ten ASEAN countries, China, Japan and South Korea. The tripartite collaboration has facilitated discussion by China, Japan and South Korea of a Free Trade Agreement (FTA) among these three countries. By finding effective measures to handle sensitive trade issues, such as agricultural tariffs, the countries will also build mutual political trust.

Working group members noted that while economic cooperation in Asia has increased in the last several years, it still is encountering challenges. As one example, although China, Japan and South Korea have launched government research projects to create a three-way Free Trade Agreement, they have so far been unable to endorse any of their experts' recommendations. These countries will need the same kind of political will to succeed that was shown in reaching the China-ASEAN Free Trade Agreement. They can build on their "binding market fundamentals," which highlight the mutual benefits of regional economic cooperation, as a means of overcoming their political differences and sensitivities.

Working group members recognized that China's astonishing economic development will likely be accompanied by greater democracy in the not too distant future. This beneficial effect will likely result from the rapid development of internal communication in China, including cell-phones and cable television. These networks will contribute to more openness and the greater exchange of ideas. The large number

of Chinese students studying abroad, as a result of China's economic development, will also engender greater political openness in the country.

In addition to strengthening their multilateral frameworks for economic cooperation, countries in the region would benefit from reaching more bilateral Free Trade Agreements. Bilateral FTAs can valuably support and complement the multilateral approaches.

It would be beneficial if the United States would clarify its policy toward new frameworks for multilateral economic and security cooperation in East Asia. Sometimes the U.S. has supported such approaches, where it has a liaison relationship but not member status, as being in the best interests of regional economic growth and trade liberalization. Other times, the U.S. has indicated it would only support such regional multilateral frameworks – especially those that address security issues – if the U.S. is a full member.

A critical area of economic concern for the future is the potential shortage of energy. Given current levels of consumption, the world will run out of petroleum in 40 years, natural gas in 60 years and coal in 220 years. East Asian countries can meet these shortages through increased reliance on renewable fuels and production of peaceful nuclear energy as well as by taking energy conservation measures.

Importantly, these potential energy shortages can spur greater economic cooperation among countries in the region. It would be highly beneficial if Russia, China, Japan and South Korea, in particular, collaborated effectively to develop means of remedying potential energy shortages. If these countries instead adopt self-interested competitive attitudes and do not cooperate, they will be unable to solve their common energy problems in the future.

The DPRK has especially dire needs in the field of energy. It now depends on the shipment of petroleum from far away sources to meet its energy needs. One of the few benefits of this situation is that it has forced the DPRK to concentrate on developing renewable energy resources in advance of other countries that may face the same kind of problem in the future. The DPRK is now investigating the extensive use of windmills in ten percent of the countryside which may greatly improve the electricity supply at the local level.

Security concerns and the DPRK nuclear issue

Despite the great promise of East Asia's economic growth and real progress in developing a framework for economic cooperation, the region faces serious security challenges. Unlike European countries, most East Asian nations have been unable to achieve political reconciliation and overcome deep-rooted suspicions growing out of Japan's colonization policy, World War II and the Cold War. East Asia faces a range of potentially catastrophic problems if economic rivalries and power politics spin out of control.

Working group members agreed that this complex situation made it all the more important for economic cooperation measures to foster greater political trust and thus a reduction of security threats among countries in the region. If it becomes possible to institutionalize a mechanism for ongoing economic cooperation, this arrangement could lead to a future regional security organization.

The security issue on which working group members concentrated most of their discussion was the current six-party talks on the DPRK's nuclear weapons program. They had a clear consensus that these multilateral negotiations have made progress in achieving a peaceful resolution of this difficult issue and must not be allowed to fail. One of the greatest

Korean DMZ.

accomplishments of these negotiations, to date, has been establishing the universally accepted principle that the Korean peninsula should be permanently free of nuclear weapons.

Working group members regretted that the round of six-party talks scheduled for late September 2004 was delayed. They believed that the negotiations can succeed if all the parties – especially the main protagonists, the United States and the DPRK – adopt a spirit and attitude of compromise. A settlement will not be possible unless each party takes into account the concerns, fears and aspirations of the other parties and shows some flexibility in addressing those issues. To date, a sincere willingness by the United States and the DPRK to reach a compromise has not been evident. The governments of both countries have occasionally engaged in sharp rhetoric which has heightened the atmosphere of tension between them.

Working group members believed the United States needs to be more forthcoming in providing security assurances and security guarantees to the DPRK, which still deeply fears an attack by the United States. The U.S. should also take the DPRK off its list of countries supporting terrorism so the DPRK can receive assistance from multilateral financial institutions. For its part, the DPRK should adopt a more flexible attitude toward inspections by the International Atomic Energy Agency (IAEA) in the context of the six-party talks, realizing that IAEA is a highly respected international organization in the view of the great majority of countries. All of the parties to the talks should show the utmost patience, adopt a constructive approach and exhibit a readiness to hear out the arguments of the other sides. They should avoid, at all costs, rhetorical statements which merely raise tensions while lowering the chance for resolution of substantive issues.

One working group member suggested that the parties to the six-party talks could achieve a breakthrough at their next round by adopting "reciprocal unilateral measures" – independent actions taken by the parties to the negotiations to reach their shared objectives. Instead of relying at the outset on formal treaty agreement – which will be difficult to achieve under current circumstances – the parties can give their negotiations strong momentum by taking significant, coordinated, unilateral actions. For example, the DPRK's decision to freeze all its nuclear facilities and allow inspections, as a first step toward ultimate dismantlement, could be reciprocated by a combination of security assurances, confidence-building measures and economic assistance from the other parties.

The European Union, though not a party to the six-party talks, can nevertheless play a critical role in achieving a settlement. By endorsing an agreement reached at the talks, the EU would provide a valuable assurance to the DPRK of that agreement's credibility.

Recommendations

Working group members believed Pugwash should pursue several important efforts to advance economic cooperation and the resolution of outstanding security issues in East Asia. These measures include:

- Conducting a workshop this Fall, following the U.S. presidential elections, on the the DPRK nuclear issue. Pugwash could invite to this workshop, in an unofficial capacity, representatives of the six parties, the European Union, the IAEA, as well as various technical experts on nuclear weapons and verification. In so doing, Pugwash could help lay the groundwork for progress at the next round of six-party talks. One specific agenda item for this workshop could be the recently reported actions of South Korean scientists in conducting fissile material experiments in the early 1980s and 2000.
- Undertaking a research effort and series of workshops on developing collaborative approaches in East Asia to meeting potential energy shortages. Experts could consider the advantages and disadvantages of cooperative development of oil pipelines, renewable energy sources and peaceful nuclear power in resolving this potentially serious problem.
- Conducting more regional workshops to address divisive economic and security issues that could undermine regional stability and, if not addressed, lead to military conflict. One of these workshops could specifically discuss the prerequisite measures for institutionalizing regional economic and security cooperation in East Asia.

Report on Working Group 5
Non-Military Threats to Security

Marie Muller and Pierre Canonne Co-Convernors
Peter Meincke Rapporteur

Introduction

Working Group 5 considered a wide but not complete range of non-military threats to security as well as a number of activities that should help to reduce the usual military threats. Some members of Pugwash may wonder at the relevance of such a wide range of topics to the goals of Pugwash. Members of the working group are unanimous in their support of maintaining such a working group because it alerts Pugwash to the wide range of other threats to human security and new ways of thinking about the problems, including contributions from a wide variety of disciplines and sources. This report begins by reviewing the non-military threats that were identified as well as a number of actions that should reduce the causes of threats to security. It concludes with a number of recommendations. The list of threats and activities is not complete and does not include climate change

Non-military threats

HIV/AIDS

In July 2000, UN Security Council Resolution 1308 established a direct and formal link between its responsibility for maintaining international peace and security and the HIV/AIDS epidemic. Pugwash Council agreed to the proposal of the South African Pugwash Group to convene two exploratory workshops in 2004. WG5 agreed that the epidemic does threaten security by using up all the capacity of the health care system, killing at the most economically productive time of life and distorting demographics in society. It is a "weapon of mass destruction" that will be around for at least 150 years. Communication with the public through media and education is essential in the war on HIV/AIDS

Obesity

The global epidemic of obesity is spreading at an alarming rate from western industrialized countries to the developing world where it often sits side by side with malnutrition. Obesity is a risk factor that is part of what is called "Metabolic Syndrome" and leads to diabetes and cardiovascular disease. Obesity, like smoking can be treated by changes in lifestyle rather than imposing additional strains on health care.

Nuclear waste management

As more and more countries opt for nuclear power to reduce greenhouse gas emissions from burning fossil fuels to generate electricity, the need for global nuclear waste management is urgent. Finland is the first country to ratify formally plans for the final disposal of spent nuclear fuel which must be handled, stored and permanently disposed of in Finland.

Misinformation in the media

WG5 discussed the threats to human security from misinformation in the media. Misinformation about HIV/AIDS can lull people to complacency about high risk behavior. The South African Pugwash has tried to counter misinformation by a journalist. Concern was expressed about the role of the media in the lead up to the invasion of Iraq.

Natural resource conflicts

Conflicts over natural resources are a potential threat to security but much

more hard information is required before one can deal with them properly.

Approaches to reducing threats to security

Involving multinational enterprises (MNEs) in global security

WG5 agreed with the need to involve MNE's in global security issues and supported the concept of a quadruple bottom line which includes security in addition to economic, social and environmental factors.

Education, especially of women

WG5 explored how education especially for women is very effective in reducing violence, empowering women, reducing birthrates and rate of AIDS infection all of which reduce threats to security.

Empowering the poor and reducing wealth differentials

WG5 learned about the Information Village Research Project in Pondicherry run by the M.S. Swaminathan Research Foundation and its success in empowering the rural poor. Although there is no hard evidence that poverty is a direct cause of conflict, there is evidence that a marked difference between rich and poor is part of a network of inter-related factors that may lead to violence.

Building bridges between opposing paradigms (World views)

Although Kuhn argues that discussion between such different paradigms is next to impossible, it was felt that strengthening the debate on the theoretical limits of economics and making ethics a necessary tool for coping with complex economic issues would help bridge the divide between the "alterglobalists" and traditional economists. There was great interest in a proposal for expanding the role of the Citizen in a five stage process of conflict resolution

Promoting ethical responsibility of scientists, engineers, economists, etc.

WG5 explored proposals for self-policing by the scientific community of the conduct of research and communication including involving ethical considerations and codes of conduct.

Improving communications

There is an urgent need for scientists to build appropriate bridges with the public and decision makers and to phrase the main conclusions of their research in a way that reflects the uncertainties and to improve communication on complex issues. Pugwash must get more involved with public education and correcting the dangerous misinformation in the media.

Recommendations

- That the Pugwash Council consider a workshop on involving multinational enterprises in Global Security in ways that do not overlap with the World Economic Forum or the Global Compact.
- That Pugwash establish closer ties with economists and organizations such as Economists Allied for Arms Reduction (ECAAR) as well as ethicists and involve them in future meetings
- That Pugwash promote a dialogue among all the stakeholders regarding the conduct of research in the life sciences and the assessment of emerging technologies.
- That Pugwash devote more time and resources to communications
- That the working group on non military threats be continued but with a reduced number of topics

54th Pugwash Conference on Science and World Affairs
Bridging a Divided World Through International Cooperation and Disarmament
5–8 October 2004, Seoul, South Korea

Nuclear Weapons and the Search for Security

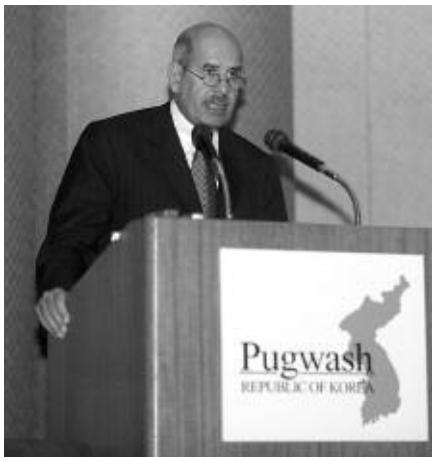
STATEMENT AT THE 54TH PUGWASH CONFERENCE ON SCIENCE AND WORLD AFFAIRS

by IAEA Director General Dr. Mohamed ElBaradei

Diplomacy versus coercion. Collective versus unilateral action. Security achieved through isolation and containment versus security achieved through dialogue and integration.

These debates are not new. But they have taken on new life as new generations struggle at regional and global levels to cope with renewed fears and insecurities, in unfamiliar forms and dimensions: the resurrection of old conflicts, the rise in terrorism, and the ever-present and ever-evolving threat of weapons of mass destruction.

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) remains the global anchor for humanity´s efforts to curb nuclear proliferation and move towards nuclear disarmament. There is no doubt that the implementation of the NPT continues to provide important security benefits—by providing assurance that, in the great majority of non-nuclear-weapon States, nuclear energy is not being misused for weapon purposes. The NPT is also the only binding agreement in which all five of the nuclear-weapon States have committed themselves to move forward on disarmament. Although the NPT is sometimes mis-perceived as a Western project, its benefits extend across any North-South or East-West geopolitical divide.



Still, for those of us who have worked as "custodians" of the Treaty for over three decades, it is clear that the events of the past few years have placed the NPT and the regime supporting it under unprecedented stress, exposing some of its limitations and pointing to areas that need to be strengthened and adjusted. Today I would like to discuss some of the lessons that can be taken from the experience of the IAEA in verifying undeclared nuclear programmes in Iraq, Iran, Libya and the Democratic People´s Republic of Korea. And because I have an audience that shares my conviction that international peace and security cannot be achieved without effective arms control, I will share a few ideas on the roles each of us can play – as scientists, policy makers and other members of civil society.

Recent Lessons In Nuclear Verification

The first lesson—and perhaps the most important lesson not only for the IAEA but also for the international community—is that verification and diplomacy, used in conjunction, can be effective. When inspections are accompanied by adequate authority, aided by all available information, backed by a credible compliance mechanism, and supported by international consensus, the verification system works. The Iraq experience has demonstrated that inspections—while requiring time and patience—can be effective even when the country under inspection is providing less than active cooperation.

A key aspect of this effectiveness — adequate authority — can only be achieved in those countries that accept the so-called "additional protocol" as a supplement to their NPT safeguards agreement. The additional protocol provides the Agency with significant additional authority with regard to both information and physical access. As illustrated by the IAEA´s experience in Iraq before the first Gulf War, without the authority provided by the protocol, our ability to verify nuclear activities is mostly limited to the nuclear material already declared — with little authority to verify the absence of undeclared nuclear material or activities. Even

with the additional protocol, IAEA verification capabilities are not without limitations; but our recent efforts in Iran, Libya and elsewhere have made clear how much can be uncovered when the protocol is applied.

The second lesson, illustrated by the evolution of the North Korean situation, is that we cannot afford not to act in cases of non-compliance. The Democratic People´s Republic of Korea (DPRK) took seven years to fulfill its obligations under the NPT to conclude a safeguards agreement with the Agency. And since 1992, shortly after this agreement was concluded, the DPRK has been in non-compliance with its NPT obligations. In January 2003, the DPRK capped that non-compliance by declaring its withdrawal from the NPT. Naturally, all of these actions were promptly reported by the Agency to the Security Council — but with little to no response. This type of reaction by the Council may be setting the worst precedent of all, if it conveys the message that acquiring a nuclear deterrent, by whatever means, will neutralize any compliance mechanism and bring about preferred treatment. On the other hand, I would note that verification and diplomacy have been an important part of the success so far in Iran and Libya, and in that sense I can only hope that the continuation of the six-party talks on the DPRK nuclear programme will yield results that will include, inter alia, full IAEA verification.

The third lesson is that international efforts to inhibit the spread of technology through the use of export controls have not been effective. The most disturbing insight to emerge from our work in Iran and Libya has been the revelation of an extensive illicit market for the supply of nuclear items. The relative ease with which a multinational illicit network could be set up and operated demonstrates the inadequacy of the present export control system. The fact that so many companies could be involved (more than two dozen, by last count) — and that, in most cases, this could occur apparently without the knowledge of their own governments — points to the shortcomings of national systems for oversight of sensitive equipment and technology. Moreover, international cooperation on export controls relies on informal arrangements that are not only non-binding, but also limited in membership, and many countries with growing industrial capacity are not included. And at present, export control information is not systematically shared with the Agency.

Clearly, we must change our assumptions regarding the inaccessibility of nuclear technology. In a modern society characterized by electronic information exchange, interlinked financial systems, and global trade, the control of access to nuclear weapons technology has grown increasingly difficult. The technical barriers to mastering the essential steps of uranium enrichment — and to designing weapons — have eroded over time. Much of the hardware in question is "dual use", and the sheer diversity of technology has made it much more difficult to control or even track procurement and sales.

We can only conclude that the control of technology is not in itself a sufficient barrier against further proliferation. For an increasing number of countries with a highly developed industrial infrastructure — and in some cases access to high enriched uranium or plutonium — the NPT community must rely primarily on continued good intentions as the basis for the adherence of these countries to their non-proliferation commitments. And good intentions can rapidly be over-run by a heightened sense of insecurity. Obviously, the narrow margin of insurance this affords is worrisome.

Lesson four: insecurity breeds proliferation. It is instructive that nearly all nuclear proliferation concerns arise in regions of longstanding tension. In other words, nuclear proliferation is a *symptom*, and the patient cannot ultimately be cured as long as we leave unaddressed the underlying causes of insecurity and instability — such as regional rivalries, the chronic lack of good governance, the divide between rich and poor, and cultural schisms based on ethnic, racial or religious differences.

It is in this context that I have also begun to stress not only the value but also the limitations of the IAEA´s role. While the Agency can use verification effectively to bring to closure questions of compliance with legal and technical requirements, the long term value of these efforts can only be realized to the extent that they are followed by the necessary political dialogue among concerned States to address underlying issues of insecurity, and to build confidence and trust.

Exploiting the Window of Opportunity

Whatever value the concept of nuclear deterrence may have served during the Cold War, as the volatile currency on which the standoff between two superpowers was balanced, it should be clear that nuclear weapons today *serve only* as an obstacle to peace and security. They have become the ultimate "elephant

in the parlor". For the five countries recognized as nuclear-weapon States under the NPT, their nuclear arsenals are increasingly becoming either a focal point for resentment or cynicism among the nuclear "have-nots", or, worse, a target for emulation for States that wish to pursue clandestine WMD programmes. Russia and the United States have long ago lost their appetite for mutually assured destruction, and now find themselves in the absurd situation of collaborating to guard against accidental launch while simultaneously maintaining, as a stubborn legacy, a hair trigger readiness for catastrophic exchange. In the Middle East and here on the Korean Peninsula, nuclear weapons — as well as real or perceived nuclear weapons ambitions — are a stumbling block that trips up attempts to resolve regional tensions.

It is the height of irony that, in today´s security environment, the only actors who presumably would find the world´s most powerful weapons useful — and would deploy them without hesitation — would be a sub-national or extra-national extremist group. A nuclear deterrent is absolutely ineffective against such groups; they have no cities that can be bombed in response, nor are they focused on self-preservation. But even as we take urgent measures to protect against nuclear terrorism, even as more and more analysts discuss the likelihood of these efforts being thwarted and such a nuclear "nightmare" occurring, we remain sluggish and unconvinced about the need to rapidly rid ourselves of the 30 000 nuclear warheads around the world, poised for use.

Why? The answer, in my view, is that the international community has not been successful to date in creating a viable alternative to the doctrine of nuclear deterrence as the basis for international security. Nuclear weapons will not go away until a proven collective security framework exists to fill the vacuum. The aftermath of the Cold War should have served as the logical lead-in to such an effort. The resulting changes to the international security landscape have been obvious; it is only that we have lacked the vision and the initiative to adapt to these changes.

If there is any silver lining to this dark cloud, it is that the window of opportunity is still open. The efforts to counteract Iraq´s phantom weapons of mass destruction, to unveil a clandestine nuclear weapon programmes in Libya, to understand the extent and nature of Iran´s nuclear programme, to bring the DPRK back to the NPT regime, and to prevent nuclear terrorism have all brought worldwide attention to bear on issues of nuclear non-proliferation and nuclear security. That energy is ours to harness. If we are ever to build a global security culture based on human solidarity — a collective security framework that will serve the interests of all countries equally, and make reliance on nuclear weapons obsolete — the time is now.

The Responsibility for Action

The question remains, how? Whose role is it to create this collective security framework? Is this an initiative for policy makers? The UN Security Council? The scientific community?

The answer, of course, is yes. It will take all of us. Progress must be made on all fronts — political, scientific and social. We must all take the responsibility for action. I do not presume to have all the answers, but I do know that the answer is not nuclear weapons. I would like to spend my remaining minutes outlining what I see as the role of leadership in each of these spheres.

The Political Front: Roles for Policy Makers and Political Leaders

Let me first turn to the political and policy front. In this area, responsible leadership must be focused on restoring and strengthening the credibility of multilateral approaches to resolving conflicts and threats to international security. The system of collective security hoped for in the United Nations Charter has never been made fully functional and effective. This must be our starting point.

The Security Council must be able and ready to engage effectively in both preventive diplomacy and enforcement measures, with the tools and methods in place necessary to cope with existing and emerging threats to international peace and security. This should include mechanisms for preventive diplomacy to settle emerging disputes within and among nations — which, if left unchecked, would, in the language of the UN charter, "lead to threats to international peace and security". The Security Council should also have, at the ready, "smart" sanctions that can target a government without adding misery to its citizens; and adequate forces to deal with the foreseeable range of situations — from maintaining law and order, to monitoring borders, to combating aggression.

A functional system for collective security is the only alternative to the reliance that some nations, including nuclear weapon States and their allies, now place on nuclear deterrence — in a "good guys versus bad guys" approach that inevitably leaves some nations out in the cold and

seeking to achieve parity. A functional system for collective security is the only alternative to the current hodge-podge of approaches to addressing security issues — ranging from inaction or late action on the part of the international community, to unilateral and "self-help" solutions on the part of individual States or groups of States.

With a viable system of collective security in place, policy makers and political leaders may find it easier to make progress on other vital objectives, such as bringing into force the Comprehensive Nuclear Test Ban Treaty, negotiating an internationally verifiable Fissile Material (Cut-Off) Treaty, and putting in place a concrete roadmap for irreversible nuclear disarmament, involving not only the NPT nuclear-weapon States but also India, Pakistan and Israel.

The development and demonstration of a collective security framework will not occur overnight, and the difficulty of achieving our ultimate objective — the elimination of all nuclear weapons — should not be used, in any sense, as a pretext for failing to achieve the intermediate step of drastic reductions in existing nuclear arsenals. In addition, there are a broad range of actions we should actively pursue to strengthen the existing non-proliferation regime, including: urging all States to bring the additional protocol into force; tightening and formalizing the controls over the export of nuclear materials and technology; working towards multilateral control over the sensitive parts of the nuclear fuel cycle — enrichment, reprocessing, and the management and disposal of spent fuel — while guaranteeing the reliability of supply to legitimate would-be users; and ensuring that States cannot withdraw from the NPT without clear consequences, including prompt review and appropriate action by the Security Council. Each of these measures would be in keeping with a collective security framework that aims simultaneously to curb nuclear proliferation and to achieve nuclear disarmament.

Striving for nuclear disarmament is not an idealistic march towards an unachievable Utopia. Just last month, seven prominent policy makers, the foreign ministers of Brazil, Egypt, Ireland, Mexico, New Zealand, South Africa and Sweden spoke out jointly, saying: "Today, we are more convinced than ever that nuclear disarmament is imperative for international peace and security." They added, "Nuclear non-proliferation and disarmament are two sides of the same coin, and both must be energetically pursued." I could not agree more. It is this type of leadership that is urgently needed.

The Scientific Front: Roles for Researchers and Inventors

The second front is one with which many of you are familiar — the role of scientists in advancing non-proliferation and disarmament objectives. In reflecting on the responsibility for action that lies with the scientific community, I cannot be more eloquent than Sir Joseph Rotblat — when he said that concepts of science as a politically or morally neutral activity are "remnants of the ivory tower mentality, although the ivory tower [of science] was finally demolished by the Hiroshima bomb."

Science brought us the atom bomb. And if we are to rid ourselves of nuclear weapons, we will need an equally intensive effort on the part of scientific researchers and inventors — to develop innovative tools for nuclear verification, mechanisms for reducing the proliferation potential of nuclear material and technology, and techniques for dismantling and destroying nuclear weapons.

In the area of nuclear verification, for example, advances in environmental sampling and analysis techniques are enabling IAEA inspectors to determine, with far greater precision, the nature and origin of individual particles of uranium — and thereby to slowly unravel the tangled pathways of the illicit nuclear procurement network. Satellite imagery technology and advanced information analysis techniques have also broadened the range of inspection capabilities.

It is important, in our search for security, that we not forget the positive aspect of "Atoms for Peace" — namely, ensuring that peaceful uses of nuclear energy remain available to all. Nuclear science plays a key role in enabling humanitarian benefits essential to development, such as: diagnosing and curing cancer patients; studying child nutrition; providing higher yielding, disease resistant crops to farmers in developing countries; characterizing and reducing airborne and waterborne pollution; analysing climate change; and, not least, producing 16% of the world's electricity, with almost no greenhouse gas emissions. The importance of continued scientific achievement in these and other areas should not be underestimated.

Scientific research and invention is needed, however, to make the nuclear fuel cycle more sustainable and more proliferation resistant. Advanced power reactor fuel cycles are under development that would use fissile and fertile materials more

efficiently, enhance proliferation resistance through the use of new fuel types and configurations, and mitigate the volume and radio-toxicity of high level and long lived wastes.

The Social Front: Roles for Every Concerned Citizen

The third front is that of society — the battle for hearts and minds — in which every concerned citizen shares a distinct responsibility for action. In countries ranging from the most powerful to some of the least industrially developed, the voice of the citizen is increasingly a weapon in the political debate. It is vital that we engage individuals from all sectors of society in a public dialogue — to remind them of the continued extant danger of nuclear war, to explain to them the alternatives available, and to offer avenues for involvement. This dialogue must be stimulated not only in large Western States but in countries across the globe. Organizations like Pugwash should continue to work to develop and refine proposals for action, to bring them to the attention of governments and opinion leaders, and to promote informed public discourse on nuclear non-proliferation and disarmament that will become too forceful and too authoritative to be ignored.

The nuclear genie is out of the box — but it remains, at least at present, at the bidding of its human makers. May it not ultimately be said of our society that we created the inventions that led to our own demise.

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7th Pugwash Workshop on the Future of the Nuclear Weapons Complexes of Russia and the USA:

Security of the Russian Nuclear Complex: International Assistance in Liquidation of Excess Fissile Materials

1–3 July 2004, St. Petersburg, Russia

Report by
Vitaly Fedchenko

The International Pugwash Conferences on Science and World Affairs in cooperation with the Russian Pugwash Committee, Russian Academy of Sciences, Center for Political and International Studies under support from Friedrich Ebert Stiftung organized and convened a three-day meeting on July 1–3, 2004 on the possible options to secure excess fissile materials in Russia, namely, its stocks of highly enriched uranium (HEU). The meeting was held in St.Petersburg, Russia. Pugwash is also grateful for the help and cooperation of the "Rubin" Central Design Complex for Marine Technology. Over 30 participants from nine countries attended the meeting, which consisted of twelve panel sessions. The panels covered a variety of issues relevant to the reduction of the threat of proliferation of excess fissile materials, including a detailed discussion of the issue of prioritization of threat reduction activities.

Session 1. Priority of the issue of the elimination of decommissioned nuclear submarines, their reactors and the reprocessing of fuel within the context of upgrading security of the nuclear complex

Discussion began by focusing on the issue of the safe decommissioning of nuclear submarines. Participants discussed new dismantlement technologies and international assistance implementation in this area. Attention was once again drawn to the fact that it is not enough just to dismantle the submarine itself. From the point of view of safety and the security of fissile materials, it is also important to properly dispose of submarines' fresh and spent nuclear fuel, which often contains the HEU. It was again confirmed during the discussion that priority should be given to the safety of the most proliferation-attractive materials. Participants of the seminar also briefly reviewed seven specific areas that urgently needed for further submarines dismantlement but are poorly funded (security upgrades for submarines that are in disrepair; construction of a long-term storage for reactor compartments in Russia's Far East; haulage of submarines scheduled for dismantlement to designated dockyards; construction of regional facilities for the disposal of solid nuclear waste and relevant chemical waste; rehabilitation of territories; dismantlement of surface ships with nuclear reactors or relevant to nuclear waste disposal).

Session 2. Anti-terrorist aspect of excess fissile materials issue and the Scandinavian initiative

Discussion began with the presentation of the report "Eliminating Stockpiles of Highly Enriched

Uranium: Options for an Action Agenda in Co-operation with the Russian Federation" prepared by the international HEU Elimination Study Group. The report concerns a study conducted for the Swedish Nuclear Power Inspectorate (SKI) and submitted to the Swedish Ministry for Foreign Affairs. It aims at establishing options for a European contribution in the field of eliminating HEU. The study emphasizes that the pace of HEU elimination should be increased substantially as HEU is by far the most direct way for rogue actors to seek nuclear explosive capabilities, while the uncertainties concerning Russian HEU holdings alone amount to hundreds of tons. The report concludes that HEU represents the largest fissile material threat to international security and stability, and proposes schemes for its elimination. Papers on possible structures for deals on rapid HEU blend-down and

its costs were also presented to the participants during the session. The importance of the HEU security was once again stressed in the context of the threat of its use in terrorist attack. However, some participants questioned the urgency of the issue by drawing attention to the proliferation of the low enriched uranium (LEU) and radioactive sources and making the point that radiological dispersal devices are more attractive to terrorists and therefore the priority should be given to security of radioactive materials and LEU.

Session 3. Modern status and problems of implementation of "10+10 over 10" international assistance program initiated by the G8.

Participants began by reviewing the process of development of the Global Partnership initiative since its inception and then discussed statements and declarations made at the G8 summit on Sea Island, Georgia. The relevant paper "Ten plus ten over ten: G8 promises and Russia's concerns" was presented during the session. Some participants concluded that the majority of documents adopted at the summit are declaratory by nature, while very little was done for actual implementation of pledges. Moreover, even the initial goal to pledge 20 billion US dollars was not met. Special attention was drawn to the issue of the reshuffling of the Russian government, initiated in March 2004 by the decree of President Putin. It was noted that key agencies in charge of the implementation of international assistance were downgraded during the reform. Therefore, it became difficult for these agencies to promote the goals of Global Partnership inside the Russian government. Additionally, the progress of reform slowed down the pace of assistance implementation.

Session 4. Differences in the perception of priorities in Europe, USA and in Russia: distribution of efforts and funds between HEU, Pu, CWC and nuclear submarine tasks.

This session focused on the differences in the perception of priorities among states contributing to Global Partnership. For example, the Russian Federation identified the four most urgent tasks it would like solved through the framework of Global Partnership: the destruction of chemical weapons, the dismantlement of decommissioned nuclear submarines, the disposal of fissile materials and the employment of former weapons scientists. Russian interpretation of documents of Kananaskis summit is that $20 billion pledged for Global Partnership are to be spent on these four priorities, while the funding for other projects under the Global Partnership framework should be allocated separately. Another major difference in priorities that participants discussed was whether only Russia and the US believe that GP funding should be increased, while other donor states believe that a $20 billion "ceiling" should be enacted. Participants agreed that those differences in priorities create major obstacles for assistance implementation process, and that a clear roadmap is needed for each project. Participants noted that this roadmap should be created collectively by donors and recipients.

Session 5. Technical, political and administrative aspects of announcing extra quantities of Russian HEU as excessive.

This session began with a statement by a participant that a political will is necessary for the declaration of a certain quantity of the HEU. Another participant noted that the announcement of an extra quantity of the HEU as excessive should be based on the analysis of the following details: First, it should be decided if the HEU is excessive only for military programs, or, if it is also unneeded for commercial use after down-blending. Second, every internationally-funded

Konstantinovsky Palace during reconstruction.

project dealing with "excessive" HEU should have means of verification that the material is of weapons origin. Third one must first identify the overall quantity of HEU, in order to calculate the exact quantity of the HEU designated as "excessive," a very costly, time-consuming and technically difficult procedure. Fourth, this issue depends on Russia's Armed Forces classified plans for rearmament and reequipment. Participants therefore concluded that it would be very difficult to calculate an exact quantity of excessive HEU, especially using open sources.

Session 6. Russian HEU-LEU deal: results of first 10 years and prospects of expediting in its second decade.

This session focused on the results that Russia and the US want to achieve through the implementation of the HEU-LEU deal. It was mentioned that Russia needs to increase the overall profit from the deal, ensure its stability, increase the income of personnel stationed at nuclear facilities, decrease the distortion of other revenues, decrease the risk of proliferation, and guarantee its national security interests. The United States, in turn, is interested in a cost-efficient project to decrease the risk of nonproliferation hopefully making it possible to ensure the stability of the uranium market. Additionally, it was explained that for Russian nuclear complex there is no technical obstacle to increasing the pace of the HEU down-blending dramatically. However, Russian uranium enrichment and down-blending facilities are more interested in preserving a stable source of income rather than reducing the amount of HEU swiftly. Therefore, Minatom is interested in a "slow but sure" pace of the deal. Participants came to the conclusion that the HEU-LEU contract is being regulated by economical rather than nonproliferation considerations in Russia and in the US.

Session 7. Studies of technical and organizational aspects of fissile materials reprocessing.

During this session the the Kurchatov Institute's study was presented. This study, which focused on the assessment of the proliferation risk (and the danger from the point of view of usability in explosive devices) of a number of nuclear materials. This study came to a conclusion that surprised many participants: LEU is far more dangerous than HEU, and therefore should be given greater priority. Although HEU is easier to be use in a bomb, LEU is far more widespread and therefore easier to obtain. Participants participated in a heated debate on the issue and remained divided on their assessment of the study's results.

Session 8. Upgrading security of the Russian nuclear complex: situation in "nuclear cities", technical, economic and social aspects of the issue.

During this session, participants discussed that the topic includes two separate issues: materials protection, control, and accountability (MPC&A), as well as social issues associated with "closed cities." Specific details of the MPC&A program and the pace of implementation of "comprehensive" and "rapid" security upgrades were reviewed. Participants concluded that the pace of upgrades depends not only on the level of financing, but also on issues of access and damage liabilities that prevent, directly or indirectly, this job from being done swiftly. Additionally, participants also discussed Nuclear Cities Initiative, Initiatives for Proliferation Prevention, programs of ISTC and social programs of European states.

Session 9. Prospects for advancement of existing and additional programs of the European Union aimed at upgrading of the nuclear security in Russia.

A variety of separate issues were discussed during this session including the idea of the internationally-accessible database of researchers and engineers with sensitive background for ensuring their employment in non-sensitive areas and threats to Russia from nuclear or radiological terrorism, etc.

Session 10. Regional aspects of international interaction in the nuclear sphere.

Three topics were discussed during this session. First, participants focused on China and nuclear nonproliferation, discussing China's attitude towards the nonproliferation of HEU. Participants were also informed that People's Republic of China has no excessive HEU whatsoever. Second, attention was paid to nuclear problems on Korean Peninsula and their influence on the Russian nonproliferation policy. Participants were reminded of the role of the USSR in DPRK's nuclear program and discussed the current position of the Russian Federation on the six-party talks on the DPRK nuclear issue. Last, participants were informed of Pugwash efforts to promote dialogue between India and Pakistan on nuclear issues.

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2nd Pugwash Workshop on Science, Ethics and Society

Ajaccio, Corsica, France 10–12 September 2004

Report
by Barbara Seiders and Marion Nowicki

The workshop was attended by 28 participants coming from 17 countries, including some students. On September 9th, during a public evening organised at the Palais des Congrés, Francesco Calogero, Jacques Diezi, Jean-Pascal Zanders and Gabriel Galice spoke about different aspects of the social responsibility of scientists, and this session was followed by a discussion with the public (200 attendants). Furthermore on September 13th, Pierre Canonne gave a class on Science, Ethics and Society to high school students.

The organisation of this workshop was fully supported by the Mouvement pour la Corse du 21ème siècle and benefited from grants from the Ajaccio Chamber of Commerce and Industry, the Mayor of Ajaccio, the Territorial Organisation of Corsica, the Corsican Tourism Office and the General Council of South Corsica.

The workshop was officially open by the Prefect of Corsica, in the présence of the Mayor of Ajaccio, the Rector of the Corse University and other authorities.

The participants were honoured by a message from Sir Joseph Rotblat that was read at the beginning of the first session (see attachment 1).

Background

At the first workshop on the subject of "Science, Ethics and Society" convened by Pugwash in Paris in June 2003, participants discussed questions of morality and ethics, neutrality of science, the responsibility of scientists and society; secrecy and counterterrorism, codes of conduct and education. The first workshop established the foundation for a discussion that was continued in a second workshop, held in Ajaccio, Corsica from 10 – 12 September 2004.

In bringing together workshop participants to continue the work begun at the first workshop, the Chairman raised specific issues within the context of science and ethics, and elicited consideration of possible courses of action. Among the specific issues raised in preparation for the workshop were questions of "science for defense" and "science for sale". These directed issues focused consideration on special questions of ethical conduct of science within the defense and commercial sectors. In the course of the workshop, considerable attention was focused on possible misuse of biological science in production of biological weapons as a particular challenge with respect to the ethical issues associated with the advanced state of the science and the malicious intent to which that science could be applied.

Similarly, the Chairman raised two specific areas for consideration of possible courses of action for discussion at the workshop: forestalling the misuse of science and enhancing public understanding of science. Options suggested for forestalling the misuse of science included codes of conduct, early warning systems for questionable research, and processes for voicing ethical concerns. The workshop discussion covered additional possibilities: prior review of research and publications; education in ethics; communication of ethical issues; identifying communities that can serve as models to establish systems or standards of ethics within science; identifying and encouraging nontraditional channels of communication; and strengthening treaties that control science and technology accessible for weapons development. Discussion on these potential courses of action – and the breadth of participants' views — were wide ranging.

Assumptions

Not surprisingly, the workshop participants differed in their assumptions regarding the general area of science, ethics and society. Among the assumptions, both implicit and explicit, that were highlighted in the course of discussion are the following:

- Ethical conduct is universal and independent of cultural context;
- Science is universal and should be universally shared;

- Science, or "pure research", can be value-neutral;
- Only in the application of results of "pure" science do ethical issues arise;
- Sponsored research cannot be conducted objectively, that is, it cannot be "pure";
- Academic science is more "pure" than science sponsored by commercial organizations, government agencies, and especially military departments;
- Research sponsored by the military is ethically questionable;
- Increased public familiarity with science is a good thing;
- Increased education of scientists on ethics would produce more ethical behavior; and
- As technology advances, the possible consequences of danger from misuse increases.

Of particular value in this workshop was the process of bringing these assumptions to the table in order to better appreciate which assumptions were generally shared — few!; and which had divergence of view — most!

Ethics and Culture, Ideology and Religion

As noted by one workshop participant, ethical behavior in science is not just about science, it is informed by ideology, religion, and culture. The different assumptions regarding the subject of the workshop reflect differing views on the relationships among ethics, culture, ideology and religion, each of which impacts recognition of standards of ethical behavior.

The relationship between ethical behavior and culture was highlighted by several examples offered by participants in the course of discussion:

- different countries and cultures attribute different value to the lives of animals than they do to humans, leading to different policies relating to use of animals in scientific experiments and testing of pharmaceuticals on animals;
- countries of different cultures have different ethical standards for the majority relative to the individual; and
- ethical standards in laboratory research may differ from ethical standards of the public at large.

The conclusion drawn by some is that, with respect to culture, there is no universal standard of ethical behavior in science. As noted above, ethical behavior is defined within the context of local culture, even though that culture can be geographically dispersed. What constitutes an ethical practice can be perceived differently from culture to culture. Even within a culturally homogeneous group, ethical responsibilities that exist at different levels of education or authority, for example, can conflict. And, it was suggested, culture specific biases can generate patterns of ignorance.

By culture, we refer to observed patterns of behavior and thinking shared among groups, including their language, traditions, art, technology, style of dress, religion, political and economic systems, in addition to rules of behavior. Ideology describes the system of beliefs, values, and ideas that form the basis of a social, economic, or political philosophy or program held by an individual or group determining how they think, act, and understand the world.

Behavior may be judged as ethical or "good," either as an inherent quality of the activity itself or because it conforms to an acknowledged moral standard. Moral standards may be based on achieving the greatest happiness; discharging duty or obligation; or striving for human perfection. Within a given sociological group, culture, ideology and religion all influence what is considered ethical behavior – depending on whether the standard invoked derives from inherent qualities, a deity, human nature, or rational thought.

The role of culture is generally a passive, observed quality of a group or society, not a driving force in and of itself with respect to individuals within that group or society. Nonetheless, culture can be a determining factor in differences in the expression of ethical standards of behavior, as illustrated for example in Jane Jacobs' perspective on the mutually exclusive "Guardian" moral syndrome and "Commercial" moral syndrome. The former is an observed moral code that Jacobs attributes to governments and religious institutions; the latter she attributes to scientists, business owners, and artists.

In contrast to culture, both religion and ideology can and often do include an active quality; a driving force within the group sharing the religious or ideological beliefs that can impact others not identified in the group or society. The workshop discussion included both positive and negative implications of the role of religion and ideology on ethical behavior. Invoking particular standards of ethical behavior by one group or society or culture may be seen by others as an attempt to impose control or assert a system of power, appropriately or not. This is particularly true when the standards at issue derive – or are even perceived to derive – from a religious or ideological basis.

Just as philosophers argue that some actions may be "good" and hence ethical by their very nature, some scientists hold the view that there is a concept of "pure" science untouched by potential conflict from sponsoring organization(s). There was a sense conveyed by some at the workshop that research sponsored by a scientific foundation is more "pure" than that sponsored by a government agency, military department or a commercial enterprise. Others raised issues with the concept of the inherent value-neutrality of science, noting that even scientific foundations have their own political and technical motivations. The divergence of view among even this thoughtful group indicates that adherence to the concept of the value-neutrality of science can represent an obstacle to productive dialog of the ethical implications of basic research.

To the extent that a universal quality of science is important, sharing of knowledge across cultures is important, and requires that cultural differences be acknowledged. Workshop participants discussed the need to recognize that ethical behavior cannot be dictated either to the public or the community of science, but that there must be dialogue on issues of importance in these cultures and communities. This recognition impacts possible courses of action. For example, while promotion of a single "universal" scientific language offers consistency and conformity of information, it does not reflect the diversity or cultural difference among societies in the scientific community. Endorsement of such a proposal by those whose culture includes the language could be legitimately driven by altruism, whereas scientists from cultures without a tradition in the proposed language could legitimately see the proposal as an attempt to assert control by countries that speak that language. At this stage, it could almost be considered a duty for scientists to publish their work in their mother tongue as a contribution towards the local scientific community and in some way to the public at large.

Issues in Context

"Science for defense": Research Funded by Defense Ministries

Context

At the direction of the Workshop Chairman, the participants considered science and ethics within specific contexts. The first of these specific contexts was in special circumstances surrounding the conduct of science in support of national defense. The Chairman raised several aspects of these special circumstances as a foundation for contributions to the workshop and subsequent discussion, including:

- The undeniable connection between science and war;
- Motivations of government (or government related) scientists and ethical threshold;
- Influence of leaders/managers of government-sponsored, national security related research;
- Transparency of the goals;
- Ethical concerns and legitimacy;
- Problems of a legal, ethical nature in connection with security-related research as well as research for military purposes; and
- Need for strategic thinking, guidelines, and definitions.

Discussion of these topics elicited a wide variety of issues associated with science, national and international security. There was some discussion of the implications of nanoscience for human health, privacy, and environmental protection. Members of the group also discussed the idea of a broader definition of "security" that

might help shift the emphasis of sponsored research in support of more peaceful endeavors. For example, in biological arena, broader definition of biological security would look to protect human health from all biological threats, not just protect against those agents that might be used as weapons in the hands of a belligerent.

Although these and other topics were discussed that related to "Science for Defense," the predominance of the workshop discussion revolved around biological weapons.

Biological Weapons

Contributions provided by several participants reinforced the unique circumstances surrounding biological science as it relates to the threat of biological weapons, as well as potential ethical issues associated with scientific programs to provide for defense against biological weapons.

Biological weapons have properties that make them very different from other classes of weapons. One of the key properties of biological weapons is that they can be produced entirely using materials, equipment and facilities that have other, completely legitimate uses. Furthermore, the technology used to provide a defense against biological weapons is largely the same as the technology that would be used to produce the weapons; the distinction between offensive and defensive biological research is very fine. Whereas twenty years ago, the threat of biological weapons seemed to have been limited to the arsenals of a few nation states, the anthrax attacks of 2001 demonstrated that a one or a few individual(s) can deploy them effectively against an entire country. Another property that distinguishes biological weapons from other classes of weapons is the nature and speed of developments in biology and biotechnology.

How the unique qualities of biology, biotechnology, biological weapons and biological defense can be addressed in recommended courses of action will be discussed within specific sections below.

"Science for sale": Research Funded by Corporations

The second special context offered by the Workshop Chairman for consideration was that of "Science for Sale," raising ethical issues associated with research sponsored by private commercial corporations. In charging the Workshop participants to consider this special context, the Chairman raised two issues in particular:

- Transparency of the goals of such research, and
- Ethical concerns and legitimacy.

Much of the discussion in this area focused on the example of pharmaceutical research and development. The premise of this area of discussion is that business practices needed to maintain a commercially viable organization may result in ethically questionable activities. Incomplete or inaccurate information regarding clinical trials may be made public; companies advertise the promise of developmental drugs that have not been fully tested; advertising to promote sales may influence the use of drugs under inappropriate circumstances; and known side effects may be misrepresented in the interests of sales of the drug. Communicating complex technical information accurately and ethically is made more difficult when information relates, for example, to the relative advantages and disadvantages of controversial drugs or therapies – in which key sectors of the public have a strong and often emotional interest.

Another issue that was raised in the context of "science for sale" is the inherent conflict between the value of publishing scientific findings to make them widely available and the need for commercial purposes to maintain control of intellectual property that might accrue from such scientific findings.

Among the potential courses of action discussed, examples were raised that apply to the issue of the ethical conduct of science in the commercial sector and will be described in the sections below.

Potential Courses of Action

A critical objective in convening a second workshop was to further elaborate on potential courses of action touched on in the first workshop that could be taken by Pugwash, individual scientists, organizations, and governments. The Chairman offered topics for consideration as potential courses of action, including 1) increasing public understanding of science, and 2) forestalling the misuse of science by establishing early warning systems, such as implementing codes of good practices and conduct, encouraging free expression of scientists and mechanisms for reporting ethical concerns, and education on ethical issues for scientists, leaders, and decision makers.

Topics identified by the Chair as possible "Early Warning Systems" that may help to prevent the misuse of science are given below. In addition to the specific recommendations from the workshop chair are two others: one that combines consideration of facilitating the communica-

tion of ethical issues by scientists and the other noting the suggestion to strengthen national and international laws and treaties that control science and technology that can be used for weapons. The following topics, candidates for consideration as early warning measures to deter redirection of science to weapons development, are discussed in detail below:

- Critical review of all the types of research/experiment before they are carried out
- Precautionary principles and audit of the risks involved
- Realistic ethical framework for early identification of novel present and future technoscience developments
- Institutionalisation: possible nature of the institutions for alert at various levels
- Role and responsibilities of research institutions and funding agencies
- Creation of a national body (Council for Science and Society) as a guide to public policy in this matter
- Facilitate ability of scientists to communicate ethical concerns, opposition to sponsored research, and providing legal protection and social support for whistle-blowers
- Strengthen treaties that control science and technology accessible for weapons development

Increase Public Awareness and Understanding of Science

Context

To stimulate discussion in this area, the Chairman provided the following suggestions for consideration prior to the workshop as possible activities that could be undertaken with a view to increasing public involvement in the scientific enterprise:

- Provision by scientists of accurate information about research facts and their social and ethical implications, responsibility of scientific institutions to the citizens, requirement for transparency and outreach;
- Establishing links to communicate research findings and put them in perspective;
- Developing scientists' communication skills;
- Integrating and understanding of society's values by scientists in their assessment of technological risks;
- Increasing communication among scientists on ethical issues; and
- Communication of scientists to the media: influence of media pressure, scientists and the "star system".

Discussion

Previously, it was noted that workshop attendants recognized that it is not possible or appropriate to attempt to dictate terms of ethical practice either to the public or the community of science. For there to be effective interaction, there must be dialog between the various parties and communities impacted. Thus, it would seem that increasing public awareness of science and the ethical issues that science frequently entails is a straightforward suggestion to increase dialog, and ultimately reduce the potential negative impact of occasions when ethical issues arise. A better informed public would seemingly be better able to participate in decision making; they might be less susceptible to "spin doctoring" of scientific information, whether as a result of unethical practices or simple over exuberance on the part of the scientist(s).

However, even with respect to this seemingly straightforward potential course of action, there were serious issues raised and discussed. Some participants noted that it is not trivial to interact with the public to increase their awareness and understanding of science, and that there are practical issues that interfere with effective communication. For example, participants noted that many scientists are unable, ill-disposed or ill-equipped to communicate effectively with the public, the press, or political leadership. Even those scientists inclined to attempt communication with the press are often limited in the amount of time they can devote to developing the relationships of trust and mutual respect that are necessary to ensure that neither the scientists nor the press will be in a position to exploit the other. In some cases, and with regard to some areas of science, the press can be hostile — or at the least, aggressive — to the point that it inhibits productive interaction. An example of such an area of science where there is often an adversarial relationship between scientists and the media is when the issue for reporting is related to the ethical foundation of a particular scientific activity. Participants discussed the difficulty of ensuring scientific accuracy in the press when it is the legitimacy of the science that is being called in to question. There was considerable discussion of the inherent merits of informing the public, when scientists might expect that an informed public would be more accepting of risk or ethical ambiguity; sometimes the opposite is true.

One workshop participant observed that scientists' ability to talk to media is often subject specific. He noted that in his country, when scientists transitioned from research associated with atomic energy to space

research, they were able to adopt a more media-friendly approach. This highlights the challenge of this workshop, whose objective is to explore those very areas of science which are likely to raise ethical issues – and hence difficulty in communication.

One participant raised a challenging issue: how can scientists work to achieve different effects in their interactions with the public, the press and policy makers? By way of illustration, she noted that in responsible communication about the threat of terrorism, the goal is to stress the need for vigilance, without paralyzing the public in fear. In contrast, in some countries, the press is being used by policy makers to underemphasize situations – such as the prevalence of HIV/AIDS – which scientists and physicians see as demonstrably catastrophic. In this circumstance, the goal is to motivate the public out of the state of complacency encouraged by policy makers to engage in the process of addressing this disaster that affects families, communities, regions, nations and the world.

In the course of the discussion on increasing the awareness and understanding of science by the public, there were a number of positive notes and some suggestions for courses of action.

One participant noted that in some countries, there is a growing trend to add interaction with the press as an evaluation criterion for scientific recognition. As with other skills, the more training and practice scientists receive, presumably, the better able they will be to communicate with the public effectively.

In another line of discussion, workshop participants noted the need to recognize the legitimate needs of the press and structure their interactions accordingly. For example, in the discussion of the difficulty of developing relationships of trust and respect between the media and scientists, one participant noted that ultimately, members of the media are seeking truth. This participant suggested that over time, it undermines their credibility to provide reporting that is found to be untrue. Being able to recognize imperfect understanding of complex technical issues on the part of a responsible reporter for what it is, rather than an attempt to misrepresent the information, can help to build a relationship of trust. As another example, scientists who recognize that reporters are frequently responding to very short deadlines and are willing to work with them on an urgent basis often find that they have helped to develop a relationship of appreciation and trust that may be important when issues of ethics and accuracy are the more compelling considerations on another day.

Increasing public awareness of science and the ethical issues that science frequently entails is a straightforward suggestion to increase dialog, and ultimately reduce the potential negative impact of occasions when ethical issues arise.

Much of the discussion about raising awareness of the press and public referred to "the public" and "the press" as if they were each monolithic entities. One course for more effective communication with both is to recognize that there are different sectors of the public and the media and that it is necessary to tailor the interaction accordingly. This includes the need to interact with both the lay public and generalists who may have very limited appreciation for the field of science on which they are reporting. Workshop participants noted that such reporters will continue to report the news as they are able, whether or not responsible scientists take the effort to maximize the accuracy of the information.

The discussion at the workshop included not only what could be done on an institutional level, but also what individual participants could do, or do better. In the discussion of the practical challenges of dealing with the press, especially when there is an expectation they will be hostile, participants discussed alternatives. For example, there is an endless need in virtually every community for scientifically trained individuals to become more involved in issues of local importance. Interaction with concerned non-scientists within a community can bolster a more coherent advocacy that can address a difficult issue collectively. A second alternative for improving communication with the public when the press is hostile is to recognize that scientists can provide advice and counsel directly to policy makers by a variety of mechanisms. One mode of communication occurs from scientists to the press, the press to the public, the public to policy makers; scientists can improve the quality of information available to policy makers by direct communication. Additional considerations in the area of better informing lawmakers and deci-

sion makers are described below. Finally, participants noted that it is possible to use to advantage technologies and modes of communication to achieve a degree of communication never before possible, via such mechanisms as the internet and in the newly emerging phenomenon of the "Café Scientifique".

One presentation offered in support of the discussion of informing the public highlighted the need to temper release of scientific information, cautioning that it is possible to go too far in communication of science to the public. In a study of the eventual disposition of medical research presented as abstracts at scientific meetings, and reported on by the media, researchers found that a substantial portion of the studies represented remain unpublished. Because the information is presented as preliminary in the form of meeting abstracts, there is no opportunity to exercise peer review of the reported results. This situation suggests a more prudent approach to scientific reporting may be appropriate, and additional courses of action are discussed below in the area of prior review of research and publication.

Increase Awareness and Understanding of Science by Local, Regional, National and International Governing Bodies

Context

A special case of "increasing public awareness of science" is to increase awareness on the part of members of governing bodies. Discussion and presentations also touched on the need to recognize different roles of leadership that apply in scientific organizations that call for communication at a variety of levels, targeting individuals with both formal and informal leadership roles. Participants also noted the importance of working with leadership in a variety of capacities: institutional leadership, scientific leadership, as well as elected or appointed political leadership.

Discussion

In one presentation, the activities of a particular committee of the US National Academy of Science (NAS), the Committee on Research Standards and Practices to Prevent the Destructive Application of Biotechnology, chaired by Gerald R. Fink were described. The Fink Committee addressed a number of specific issues discussed within the workshop including the issue of increasing awareness of science on the part of institutional and elected leadership.

Although the National Academy of Science is not a government agency, recommendations by its committees are generally persuasive to key policymakers within the United States government, the governments of other countries, and other organizations. In the case of the Fink Committee, their deliberations resulted in seven recommendations that are very similar to aspects of the discussion of the current workshop.

With respect to the current potential course of action, increasing awareness of science by policy makers, the Fink Committee recommended that the United States undertake to establish a National Science Advisory Board for Biosecurity (NSABB) specifically to advise and guide the government in issues associated with advances in biotechnology, and the security, health and ethical issues they may entail.

For the United States to undertake measures such as those recommended by the Fink Committee is important, but the workshop discussion reinforced that attempts to reduce the risks associated with biotechnology must ultimately be international in scope, because the technologies that could be misused are available and being developed throughout the globe.

Increase Prior Review of Proposed Research and Publications

Context

Workshop participants devoted a significant amount of discussion to the need for and possible mechanisms to be used in the review of scientific results prior to publication, as well as the need for review of research objectives prior to undertaking studies of ambiguous ethical foundation. An important aspect of this suggestion was recognized by the Fink Committee: which is the need to develop and promulgate guidelines for the appro-

Table 1. *Recommendations of the Committee on Research Standards and Practices to Prevent the Destructive Application of Biotechnology*

1. Educating the Scientific Community
2. Review of Plans for Experiments
3. Review at the Publication Stage
4. Creation of a National Science Advisory Board for Biodefense
5. Additional Elements for Protection Against Misuse
6. A Role for the Life Sciences in Efforts to Prevent Bioterrorism and Biowarfare
7. Harmonized International Oversight

priate communication of dual use research methodology and research results.

In discussing the importance of increasing public awareness of science, workshop participants also recognized that in some cases, full disclosure might be counter to sound ethical practice. In one example given previously, participants described research in which medical research studies were featured prominently in the media on the basis of abstracts presented at scientific meetings, even when the studies were not eventually supported by full, peer-reviewed publication. This situation suggests the possible need for review of scientific findings prior to their release to the public. In addition to calling into question the practice of prematurely releasing scientific findings that are not borne out by complete experimentation or peer review, there is the question of publication of information that can be exploited by terrorists and others to cause harm. Discussion on this topic seemed to reflect similar views of scientific journal editors and authors, who felt, as related by one participant,

> a fundamental view, shared by nearly all, that there is information that, although we cannot now capture it with lists or definitions, presents enough risk of use by terrorists that it should not be published. How and by what processes it might be identified will continue to challenge us, because it is also true that open publication brings benefits not only to public health but also in efforts to combat terrorism.

The general view of the workshop seemed to be that members of the scientific community should develop procedures for such review of research and publications, drawing on the experience during the emergence of the field of biotechnology with respect to oversight of recombinant DNA research. In the view of workshop participants, it seems important to be able to rely on self-governance by scientists and scientific journals to review experiments and publications for their potential national security risks. Participants saw it as important that such review be undertaken by the scientists themselves for a variety of reasons: maintaining the autonomy and integrity of science; ensuring that the review would be carried out by those most knowledgeable about the subjects at issue; the need to specify standards appropriate in each field of inquiry; and the desire to forestall unwieldy and inappropriate government-imposed measures. Self-regulation within the scientific community would require involvement of individual scientists, research organizations, and scientific publishers. Editors of journals should constrain information if in their judgment the information has a reasonable potential to do harm. A difficult – and potentially unanswerable – question for both authors and editors is whether the risk outweighs the likely benefits.

With respect to prior review of proposed research, one participant described an approach based largely on the findings of the Fink Committee. The Fink Committee identified seven classes of "experiments of concern" (see Table 2) that illustrate the types of research that should undergo review and discussion by informed members of the scientific and medical community before they are undertaken or, if carried out, before they are published in full detail. The Fink Committee proposed a system that would establish a number of stages at which scientists would review experiments and eventually their results to provide reassurance that advances in biotechnology with potential applications for bioterrorism or biological weapons development receive responsible oversight.

In research institutions in the United States, an appropriate body for the first formal review of proposed research is the Institutional Biological Safety Committee (IBC). Institutional Biological Safety Committees are responsible within organizations carrying out biological research for oversight of research involving etiological agents, select agents, and agents requiring biological containment measures. By recommendation of the National Institutes of Health, the IBC includes participation by the public in the form of com-

Table 2. *Fink Committee Experiments of Concern*

1. Demonstrate how to render a vaccine ineffective
2. Confer resistance to therapeutically useful antibiotics or antiviral agents
3. Enhance the virulence of a pathogen or render a nonpathogen virulent
4. Increase transmissibility of a pathogen
5. Alter the host range of a pathogen
6. Enable the evasion of diagnostic/detection modalities
7. Enable the weaponization of a biological agent or toxin

munity members of the committee. In research institutions in the United States, the IBC may be able to provide an assessment of research at its earliest stages, when the direction and objectives of questionable research can be redefined as needed.

As noted above, also among the recommendations of the Fink Committee was the recommendation to harmonize international oversight of biotechnology-related research. Some participants in the workshop endorsed the concept of creating an international forum to work toward a common understanding of security concerns and eventually, an international norm against misuse of genetic information. Others, however, felt that the system described under development in the United States was extremely intrusive. Some of these participants noted that international harmonization should include harmonization appropriate to different risk levels. In the view of these participants, for developing countries to adopt such intrusive measures without a commensurate risk would divert effort and funds from other productive activities.

Increase Education on Ethical and Biosecurity Issues

Context

Prior sections of this report have described discussion within the workshop of the need for education of the press, the public and policy makers in science. The workshop also covered the need for a different area of education, specifically, the need to provide education on ethics and biosecurity to scientists. This concept was also raised in the context of the Fink Committee recommendation to develop and implement programs for education and training in biosecurity issues for all scientists and laboratory workers at federal as well as federally funded institutions.

Discussion

While workshop participants seemed to have a general sense that this was a good and straightforward recommendation, it also raised issues. Among the immediate questions raised were, whose system of ethics? Who should teach? Is it possible to teach ethics without turning the instruction into ideological indoctrination? Who is to be responsible for such a course of instruction? Are there empirical studies of the impact of the courses that suggest such training would contribute to an improved environment of ethical practice? At what age should a person's ethical training start?

In the view of one participant, ethical behavior could only be expected to be handed down from elder to younger scientists. This view highlighted differences of view as to the likelihood of scientists at different stages in their career, their lives and their training to act ethically (or not). There was general agreement, however, that young scientists have both the capacity for and interest in ethical analysis, and that early education in ethics may help shape culture of scientists and reduce culture-specific biases. This agreement among workshop participants did not settle the question, however, of how best to enhance the degree and quality of training in ethics for scientists.

One participant offered a practical example of circumstances in which educational support in the field of ethics could be of help, specifically, to provide aid and assistance to the scientist who has identified an area of ethical concern, but who needs help in how to address it. The individual observed that scientists need a system for analyzing ethical implications of the potential course of action, and that making such a tool more readily available would contribute to the goal of improving the familiarity of scientists with ethical analysis.

Although education is of utmost importance, other factors cannot be forgotten: for example in the end, engineers are responsible to those in charge of their project, rather than to humanity. In fact, there was a concern that courses might become references set in stone, rather than methods of approaching ethical issues (a set of rules rather than a set of tools).

Establish Codes of Conduct

Context

In introducing this line of inquiry into the workshop, the Chairman raised a variety of questions regarding recommendations to establish codes of conduct, specifically:

- Role in combating the diversion of science advances into activities that threaten global security and peace
- Obligations under international treaties: links between codes of conduct and/or codes of good practices and international agreements aimed at preventing illegal weapons development and use
- Is an international consensus possible?
- Need for a Scientific "Hippocratic" Oath

Discussion

On this issue, workshop participants held widely divergent views. A number of participants expressed the view that codes of conduct were an appropriate step to attempt to encourage

ethical behavior among scientists. Some of these participants described specific formulas for possible codes, as well as general guidelines that might be used to develop appropriate codes of conduct. One participant suggested that emphasis in the development of codes of conduct should be on individual scientists; codes of conduct should not dictate permitted or prohibited experiments but rather guide acceptable or unacceptable intent for research. In the discussion, there were suggestions to compile examples of such oaths or codes, or the rules by which groups sought to define them. In the view of some participants, codes of conduct are seen to be reflective and reinforcing of a norm of ethical practice, and hence valuable. One possible path to implementing codes of conduct is contained in the report of the Fink Committee, where they suggest that development and adoption of codes of conduct lies with governance of relevant professional societies:

[The Committee] believes that it is the responsibility of the research community, including scientific societies and organizations, to define what these reasonable steps entail and to provide scientists with the education, skills, and support they need to honor these steps. These principles should be added to the codes of ethics of relevant professional societies.

Not all workshop participants viewed the development and adoption of codes of conduct as useful. Some noted that asking scientists to act to prevent the use of their science for questionable purposed implies calling on them to predict the future, to anticipate how the product of their scientific enterprise might be used to nefarious ends at some unspecified time in the future, and to control the actions of others. It was noted that many scientists are unable to assess the positive uses to which their science can be immediately applied, much less anticipate an indefinite future.

Related to this concern is that the time that is sometimes required for basic research to be translated into application can be substantial, even when those applications are targeted early in the process of research and development. Asking scientists to be responsible for the duration of the developmental process is impractical at best. In the medical field, standards are legally binding. However this doesn't allow for intuitive judgement, nor for considering the individual cases.

The time that is sometimes required for basic research to be translated into application can be substantial, even when those applications are targeted early in the process of research and development.

Whereas some see establishment of codes of conduct as reinforcing norms of ethical behavior, others note that this applies only to the extent that the norms are shared. In the case of ethical practices, it has already been noted that there are many bases for judging the ethical quality of activities. The extent to which norms are not shared or standards used to judge ethical practices differ, calls into question the value of codes of conduct. Some felt that the only way for codes of conduct to be effective is if they are world-wide and binding. Important questions were raised with respect to binding codes of conduct, specifically, how would codes be enforced and who would be responsible for their enforcement? In the view of some workshop participants, based on experience with other informal international agreements, it is better not to have safeguards than safeguards that are unsafe, in the same way that it is better not to have laws which are breached too often.

N.B. As a follow-up to the workshop, two participants, Margaret Somerville and Ron Atlas, have proposed an interesting "Code of ethics for persons and institutions engaged in the life Sciences which could be used as a basis for future discussion. (see attachment 2)

Facilitating the Communication of Ethical Issues by Scientists

Discussion

While several of the documents prepared to support discussion at the workshop addressed the issue of protecting scientists who raise ethical issues, and how to facilitate the communication of such concerns, the discussion on this point was interwoven throughout other elements of the workshop. For example, as reported previously, one example was offered in which educational support in the field of ethics could be of help, specifically, to provide aid and assistance to the scientist who has identified an area of ethical concern, but who needs help in how to address it. The individual observed that scientists need a system for analyzing ethical implications of the potential course of action, and that making such a tool

more readily available would contribute to the goal of improving the familiarity of scientists with ethical analysis. As another example, discussion of facilitating raising of ethical issues by concerned scientists, it was observed that communities in which norms or codes of conduct are recognized set the stage for such scientists to be able to speak out when they see activities at odds with those norms.

Strengthen National and International Laws and Treaties that Control Science and Technology that can be used for Weapons

Discussion

The Workshop participants discussed the role of the Biological and Toxin Weapons Convention (BWC) and the Chemical Weapons Convention (CWC) in efforts to reduce the use of biological research and development for weapons purposes. It was pointed out that these treaties reflect norms of behavior, which is positive.

There is a need for international agreements such as the BWC to be made flexible enough to address technological advances. One participant cited the provisions of the CWC and BWC in banning weapons outright, and raised the question of the relationship of non-lethal chemical or biological weapons under the Treaties. In his view, as an outright ban, these treaties eliminate these classes of weapons from military doctrine of those nations who abide the terms of the treaties. By maintaining a technological exclusion to the treaty, such as non-lethal chemical or biological weapons, parties can maintain the capacity to use weapons. The CWC has a technological exclusion for agents used domestically for law enforcement; it was the view of this participant that such exclusions were unhelpful in that they opened the door for use under other circumstances.

One issue acknowledged among the workshop participants is that international treaties such as the BWC or CWC are binding on states; but these weapons are accessible to groups and individuals, possibly without the knowledge or involvement of the state party government. Because the weapons can be obtained by individuals and groups without knowledge of government, it raises questions of accountability. This issue

Communities in which norms or codes of conduct are recognized set the stage for scientists to be able to speak out when they see activities at odds with those norms.

in turn suggests the need to engage the widest possible community of leadership in order to maximize the likelihood that illicit activities will be seen and recognized as illicit by someone who has the knowledge and tools to do something about it – whether the response is reporting to law enforcement, corporate management, municipal or other elected political leadership.

Along the lines of empowering lower levels of leadership to recognize and act to prevent unethical use of science, the Fink Committee included among its recommendations the merit of developing and promulgating national guidelines for local (e.g. institutional) and federal oversight of dual use research; fostering the extension of biosecurity policies to the international arena; adopting restrictions on access to dangerous pathogens; and self policing of life sciences research and information to limit potential misuse.

Identify Communities that Represent Ethical Scientific Conduct

Discussion

In the course of interactions at the workshop, one participant suggested looking to examples within the scientific community with prior experience developing and refining standards of ethical practice. That participant described the field of medicine as one scientific community that has evolved standards and practices of ethical conduct. She indicated that evolution of the system of medical ethics has been ongoing for 30 years, and it may be appropriate to consider what elements of the systems of ethics that has emerged in medicine has applications elsewhere. It could be appropriate to consider what lessons may be learned that would be better not to repeat in other communities. For example, the current practice of ethics in medicine arose from an emphasis on differences, spawning litigation, as opposed to an emphasis on the basis of consensus or agreement. Also, there used to be a separation between pure research and therapeutic medicine which does no longer exist.

Identify and Encourage Nontraditional Channels of Communication

Discussion

In various contexts, both in the prepared materials for the workshop

and in the discussion, it was acknowledged that ethical conduct is a responsibility at all levels of an organization, national and international leadership. One participant posited that some systems of leadership may be more susceptible to challenges to ethical conduct of science, so that the issue must be engaged at all levels, not just at the level of national leadership or just at the level of individuals. Participants discussed the need for creative approaches to encourage ethical standards of behavior, partly for reasons already discussed, e.g. imposition of control measures from outside a country or culture or organization may be less effective than controls put in place internally because the former could be perceived as inappropriate attempt to control. Finally, it may not be adequate to pursue formal, traditional modes of engagement, because rogue states, terrorists, and criminals may distance themselves from regulated environments. The community of scientists conducting similar research may have the best (albeit limited) window into activities others may try to hide.

One particularly intriguing proposal offered at the workshop, consistent with looking for nontraditional channels of communication, was to consider using art as a means to convey ethics.

Future work

The possibilities discussed for future work of Pugwash in the area of Science, Ethics and Society are wide ranging. They included recommendations brought forward from the 2003 workshop, which specifically suggested that Pugwash could:

- On its own, issue a letter on the ethical responsibilities of scientists or sponsor a book on the subject which would lay out the choices available.
- Establish a website, either for discussion of ethical issues among scientists or as a mechanism to share information about educational initiatives and materials suitable for use in ethics training.
- Endeavor to institutionalize early warning functions against the misuse of science, by actively participating in activities whose objectives are to strengthen in international arms conventions, provide information about the physical and social risks of new technologies, and increase societal support for whistleblowers.
- Engage the Student Pugwash group, as suggested in their paper.

An important general issue remains for potential exploration in Pugwash: how to identify and discuss novel technological and scientific developments as they appeared over the horizon, before their social implications had become widely recognized, to provide a realistic ethical framework and a reliable factual background for this type of discussion? How to set up a realistic ethical framework for early identification of novel present and future technological and scientific developments? Future work could continue to explore these questions, possibly following the work of Working Group 5 from the 2003 Halifax Pugwash Annual Conference. In their report, WG5 identified specific guidelines to judge circumstances that may warrant attention with respect to their ethical foundation:

a) If science or technology creates a circumstance that poses potential threats to global or human security then we, as scientists, have a responsibility to do something about it;
b) If a complex problem is emerging, or a simple problem has to be looked at in a complex context, and engagement with it is not possible without thinking in a new way;
c) If new technologies are required to deal with a problem; and
d) If issues are systematically forgotten or suppressed.

Given the breadth and complexity of the area, future work of Pugwash in Science, Ethics and Society could include establishing a working group on "Early warning and preventive action on emerging technologies". Topics for review within such a working group could be: the character of the early warning institutions and the scientific analysis of examples of potential threats from emerging technologies—downside consequences of nanotechnology, biomedical technology etc., and security and privacy issues related to ICTs (Echelon etc.). The analysis should include contextual aspects (commercial, religious, and ideological etc.) surrounding emerging technologies, as well as account for the epistemological and historical meta-assumptions on which they are built.

Discussion at the second workshop on the possible implementation of a website included a number of potential uses, not all of which were foreseen in the first workshop. Most of the discussion also revolved around establishing a website to serve as a repository for resources that could be shared, including:

- A collection of examples of codes of conduct;
- Educational materials and references;
- Professional materials and references, as illustrated by the webpage for the Public Assistance Hospitals of Paris (see www.APHP.fr);
- Programs, training, tools, experiences on communicating science to the press and public;
- History and philosophy of science and ethics; and
- A directory of experts in science and ethics.

In addition to its possible uses as a repository of information, the workshop participants discussed whether it might be feasible to exploit the internet for its collaborative and dynamic interaction tools. Examples of such nontraditional tools that might spur a new form of interaction for Pugwash on these issues include shared server resources, such as SharePoint sites, or tools that depend on interaction within a community for its value, such as the free internet encyclopedia, Wikipedia. It was asked whether there was merit in organizing a discussion network on the issue of early warning systems, and it was noted that this might be a subject for internet-based interaction as well.

Related to the suggestion to use an internet site to accumulate examples of codes of conduct, it was suggested that future wok could include sponsoring and endorsing a Pugwash student project to accumulate and analyze variations of codes of conduct. In future activities, Pugwash could encourage students or junior Pugwashites to explore creating their own pledge or /code of conduct. Participants in the workshop discussed that analysis of codes of conduct might also be interesting as a dissertation project for a student in scientific ethics. It may be appropriate to include the issue of whistle-blowing protection into the code of conduct.

Several papers contributed for the workshop suggest the possibility of preparing a Pugwash position paper on the dangers in biology research. Participants asked whether it would be possible and/or appropriate to draft an appeal by an international group of high-level scientists regarding the conduct of research and the communication in the life sciences for a self.-policing by the scientific community, using an agreed upon and internationally harmonized framework, as has been done for recombinant DNA research.

A variation on the theme of preparing a special paper under formal Pugwash sponsorship was to assemble the papers prepared for this workshop into a book.

The subject was raised of collaborative efforts between Pugwash and other organizations, in particular the International Council of Science (ICSU). From the perspective of an organization like ICSU, there is potential added value of working with Pugwash, given their complementary membership and outstanding reputation. It was suggested that there was common interest of the two organizations in relation to science and society that might warrant potential for future partnerships on specific projects. In this regard it was noted that a substantial element of the reputation of Pugwash arose specifically because it maintains its autonomy and objectivity, and absent a compelling reason to change this practice, it was unlikely that proposals for joint activities would proceed very far.

A significant amount of discussion at this workshop focused on the scientific and ethical issues associated with biological research and its potential use in making weapons. Participants at the workshop discussed the value of identifying a specific topical theme to stimulate additional discussion in the net phase of activity. The principle topic that arose in the discussion among participants that was a significant issue within society with implications of science, technology, society and ethics was the response to the HIV/AIDS epidemic worldwide. This topic seemed to be an excellent possibility for focusing additional future analysis among Pugwash workshop members.

The Chairman discussed a possible time and location for the next meeting and identified June of 2005 as a possible date, with the third workshop possibly to be held again in Corsica, France.

[1] National Research Council of the National Academies of Science, Committee on Research Standards and Practices to Prevent the Destructive Application of Biotechnology, chaired by Gerald R. Fink, 2005.

[2] "Uncensored exchange of scientific results," Proceedings of the National Academies of Science, Journal Editors and Authors Group, February 18, 2003.

ATTACHMENT 1

Pugwash Conferences on Science and World Affairs

From:
Professor Sir Joseph Rotblat FRS London Office
63A Great Russell Street, London WC1B 3BJ
e-mail: pugwash@mac.com
Colonel Pierre Canonne and all participants at the
2nd Pugwash Workshop on Science Ethics and Society
Ajaccio, 9–12 October 2004, 03 September 2004

Dear Friends,

I deeply regret not to be able to be with you all in person. You are going to discuss a most important aspect of Pugwash activities. Indeed, I would say that working out a sound relationship between science and society is the *raison d'être* for Pugwash, a feature distinguishing us from other anti-war and anti-nuclear organizations. It was my fervent hope to be with you in Ajaccio, but unfortunately the state of my health does not allow me to make the journey from London. This will be the first Pugwash symposium on this topic that I will have missed.

You have a very comprehensive agenda, embracing a number of problems that have arisen as a result of the application of the fantastic progress in science and technology. Most of these applications have proved to be of benefit to human society, but others have posed new dangers, threats to our civilization, and perhaps even to our very existence. Science is playing an ever increasing role in every walk of life, and this puts an extra obligation on scientists to be accountable for their deeds.

Unfortunately, there are still many scientists who do not accept their social responsibility. The task of the scientist – they say – is to search for knowledge, and how his or her knowledge is applied is not the business of the scientist. Moreover, some believe that the search for knowledge overrides all other considerations and that scientists should be entitled to ignore the ethical elements of their work.

The harm to society that has resulted from such attitudes has brought science into disrepute, and action is needed to restore the proper image of science. The introduction of a "hippocratic" oath is our example of such action, but it should perhaps be given more than a symbolic value. Perhaps the time has come for a binding code of conduct, where only those who abide by the code should be entitled to be practicing scientists, something which applies now to medical practice.

Dear friends, I have touched on only one of the issues on your agenda, in order to illustrate the great task for you during your time in Ajaccio. I wish you an intense but friendly discussion and full success in your deliberations.

Yours sincerely,
Joseph Rotblat

ATTACHMENT 2

Code of Ethics for Persons and Institutions Engaged in the Life Sciences

Whereas:

Ethics must be embedded in all aspects of scientific research from its inception;

All persons and institutions engaged in science and medicine must first seek to do no harm and where possible to do good;

The power of science to result in harm, if it is not governed by strong ethical standards, has been vastly augmented, in particular, by advances in molecular biology and informatics and especially in the context of the life sciences;

Society has entrusted all people engaged in all aspects of science, in particular, scientists, physicians, other researchers and scientific institutions, to undertake it in such a way as to show respect for all life, especially, for all people, including future generations;

Safeguards are needed to ensure fulfillment of the public trust and the fiduciary obligations it engenders, and to protect against breach, in particular, to ensure that science is not used in the cause of biowarfare or bioterrorism;

A code of ethics, setting out the principles that collectively form the standards of conduct that define the essentials of ethical behavior for all people engaged in all aspects of science, in particular, scientists, physicians, other researchers and scientific institutions, is needed to contribute to the protection of present and future generations of humans, other living creatures and our planet

against the misuse of science, especially the life sciences;

The standards of behavior embodied in a code of ethics will help to protect against the misuse of science, especially the life sciences;

Compliance with a code of ethics and adherence to its principles is both the individual and collective responsibility of all people engaged in all aspects of science, in particular, scientists, physicians, other researchers and scientific institutions;

A code of ethics will underline the importance of ethics review of proposed scientific research and the monitoring of on-going research;

A code of ethics will support the protection of people who act in accordance with its requirements to bring breaches of ethics in scientific research or the misuse of science to the attention of relevant authorities or the public;

Scientists, physicians, other researchers and scientific institutions who fail to act ethically are at high risk of losing the respect of their peers and the respect and the trust of society as a whole, which would have harmful consequences, not only, for them, but also, for scientific research, all people and institutions engaged in science, and society;

Some breaches of ethics can concurrently constitute contravention of existing law and, because codes of conduct and ethical principles that are broadly accepted by one's peers are often used by courts to establish legal standards, violations of a code of ethics could result in legal penalties as well as censures for breaches of ethics.

A code of ethics based upon strong principles will facilitate transmitting the values that must govern scientific research to trainees and students and provide them with both guidance for themselves and benchmarks against which to assess the conduct of their teachers and mentors

Pierre Canonne, Marie Muller, Francesco Calogero, Claudia Vaughn, Venance Journé, Barberine Nicoli.

Therefore, all people and institutions engaged in all aspects of scientific research and development, in particular, in the life sciences, must:

Work to ensure that their discoveries, knowledge, and application of those discoveries and knowledge, first do no harm, in particular, to the well-being of humankind and life on the Earth.

Work for the ethical and beneficent advancement, development and use of scientific knowledge.

Refuse to engage in any research, development or use of science that is unethical, in particular, that is intended to facilitate—or when there is a real possibility of its being misused to facilitate—biowarfare or bioterrorism, both of which violate the fundamental moral values of humanity.

Never, under any circumstances, knowingly or recklessly to contribute to the development, production or acquisition of microbial or other biological agents or toxins, whatever their origin or method of production, of types or in quantities that cannot be justified on the basis of their being necessary for prophylactic, protective, therapeutic, or other peaceful purposes.

Take steps to prevent any research or use of science that is unethical, especially that which could facilitate biowarfare or bioterrorism and, in particular, the misuse or potential misuse of one's own discoveries, teachings, knowledge, or scientific advancements for such purposes; and to call to the attention of the public, or the appropriate persons or bodies, unethical research or misuses or potential misuses of science or scientific information for such purposes.

While facilitating, to the fullest extent possible, the exchange of biological materials for peaceful purposes, take prudent steps to assure biosecurity by seeking to ensure that only individuals for whom there are reasonable grounds to believe will not misuse them are provided with biological agents that could be used unethically, in particular as weapons; and by restricting access to such agents within laboratories and collections to individuals with bona fide needs for them for ethical research, clinical diagnostics, or other medical uses.

While facilitating, to the fullest extent possible, the generation and exchange of biological, scientific, and technological information and knowledge for peaceful purposes, in those rare cases where there is reasonable concern that information or knowledge could be readily misused to do harm, in particular, to develop biological weapons or for use in biowarfare or bioterrorism, seek to restrict the dissemination of such dual use information or knowledge to those who need to know.

Ethically justify undertaking any given scientific research or development, in particular, through ethics and safety reviews; that is, the persons engaged in any aspect of scientific research have the burden of proof of its ethical acceptability and safety where there is doubt about its potential to do harm, or whether its development or potential uses are within legitimate peaceful purposes, or whether the legitimate benefits being sought outweigh its risks and harms.

Abide by prevailing laws and regulations that apply to the conduct of science, unless doing so would be unethical. If an individual believes that certain laws and regulations breach the obligations set out in this code, he or she must work through the relevant societal institutions to change those laws and regulations so as to become consistent with the ethical principles set forth in this code.

And

Faithfully transmit the duties and obligations embodied in this code of ethics, and the principles upon which it is based, to students, trainees and others who are, or may become, engaged in the conduct of science.

Drafted by Margo Somerville and Ronald Atlas, 20th November 2004

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21st Workshop of the Pugwash Study Group on the Implementation of the Chemical and Biological Weapons Conventions: *The BWC New Process and the Sixth Review Conference*

Geneva, Switzerland, 4–5 December 2004

Report

by Scott Spence

Introduction

This was the eleventh of the current Pugwash workshop series on countering chemical and biological weapons to be held in Geneva. It was jointly convened by the Pugwash Study Group on the Implementation of the Chemical and Biological Weapons Conventions and the Harvard Sussex Program on CBW Armament and Arms Limitation, and hosted by the Swiss Pugwash Group. The meetings were held on the campus of the Graduate Institute of International Studies, University of Geneva.

Over fifty people attended the workshop, by invitation and in their personal capacities, from 19 countries (Australia, Belgium, Brazil, Canada, Germany, India, Iran, Ireland, Israel, Italy, the Netherlands, New Zealand, Pakistan, Russia, South Africa, Sweden, Switzerland, the United Kingdom, and the United States). This report does not necessarily reflect a consensus of the workshop as a whole or of the Study Group.

The focus of the workshop was the BWC Inter Review Conference Process, sometimes referred to as the New Process, and, in particular, the Second Meeting of States Parties in December 2004 and the Third Meeting of Experts and of States Parties in 2005. The workshop also looked ahead to the Sixth BWC Review Conference in 2006 and beyond.

The meeting opened with a welcome by Professor Jean-Pierre Stroot of the Geneva Pugwash Office, President of the Board of the Geneva International Peace Research Institute, and former Director of Research, IISN, Belgium. Professor Stroot honoured the memory of Martin Kaplan by asking the workshop participants to observe a moment of silence.

Reports

The Chemical Weapons Convention: Progress in implementation

A report was given on the status of implementation of the Chemical Weapons Convention, including a snapshot of how many chemical weapons have been destroyed thus far: as at 31 October 2004, some 10,000 out of 71,000 agent-tonnes of chemical weapons (14 per cent) have been destroyed in addition to 2.14 out of 8.7 million munitions (25 per cent). Though destruction of chemical weapons is behind schedule, it was observed that the destruction, or in some cases conversion, of chemical weapons production facilities has been timely.

With regard to verification, it was noted that some 1,900 inspections, comprising 105,000 inspector days, have taken place in 68 states parties at 785 facilities. Optimisation was also discussed as a means of keeping up with the pace of chemical weapons destruction and in particular the anticipated increase in the number of continuously-operating chemical weapons destruction facilities that will be on line at any given moment. It was observed that there has been discussion about the need to increase and further focus verification of other chemical production facilities (under Article VI of the CWC) because approximately ten per cent of them are highly versatile in terms of equipment, design and chemistry used, and could have the potential to be converted to make chemical weapons agent.

The action plan on national implementation of Article VII obligations was discussed. It was noted that it had been adopted by the Conference of the States Parties at its eighth session (20-24 October 2003) and that its obligations must be met by the tenth session (7–11 November 2005). Such obligations include establishing or designating a National Authority and adopting national implementing legislation and administrative or regulatory measures. Indicators of compliance with implementation of the Convention include submissions of annual declarations, submission of information further to reviews of

Jeanne Guillemin.

trade measures, and submission of information about national protective programmes. It was emphasised that the action plan is not an assistance plan but that assistance is available from other states parties, the Technical Secretariat, and the Network of Legal Experts. A progress report to the Conference at its ninth session (29 November–2 December 2004) was discussed in which it was made clear that much work remains to be done. With the addition of new states parties in the last year, it was observed that there will need to be additional momentum to meet the deadline for the action plan. It was also observed that there is overlap between the plan and UN Security Council resolution 1540 (2004). In particular, both emphasise the importance of implementing legislation whereas to date, only 32 per cent of the CWC states parties have comprehensive legislation in place. The importance of having transfer measures in place was also noted in the context of the resolution.

Turning to the universality action plan, adopted by the Executive Council at its twenty-third meeting (21 and 24 October 2003), the speaker first noted that it "was inspired by the idea" of full universality of the Convention by 2007. It was observed that in the last year, a key step in achieving universality was Libya's accession to the CWC; it was added, however, that this was not necessarily a result of the action plan but of several years of hard work. Regarding achieving universality at the regional level, it was noted that the African Union and other international organisations have been playing an important role in Africa and other regions. Gaps in universality were highlighted, particularly in the Middle East, and on the Korean peninsula, as well as in Africa and the Pacific and Caribbean regions.

Turning to optimisation (of the use of verification resources), a report on this topic was discussed. It was noted that optimisation for chemical weapons storage facilities, chemical weapons production facilities, and old and abandoned chemical weapons will be based on risk assessments to determine how many inspections will be needed, the frequency, and the size of the team. However, a key area will be destruction-related inspections: the focus will be on reducing team sizes through increasing instrumental monitoring/recording and surveillance/containment of exit passages at chemical weapons destruction facilities. Sequential Article VI inspections were also mentioned.

On the matter of international cooperation and assistance, it was stated that there is no final agreement on a full programme of activities but that some programmes are in place. It was added that some states parties want an evaluation of the current menu of activities and perhaps some new ones as well. Attention was brought to specific programmes including implementation support for Article VII efforts, assistance and protection including ASSISTEX 2, and an agreement on a format for submission of information regarding national protective programmes.

Education and outreach were discussed including a recommendation by the Scientific Advisory Board concerning a joint project with IUPAC, which will include addressing how codes of conduct should reflect chemical weapons prohibitions and introducing awareness and requirements of the CWC into chemistry education.

In response to this update on implementation of the CWC, it was observed by one participant that the Meeting of States Parties in 2003 did not follow a similar approach to the OPCW in adopting an action plan for implementation of the BWC. Further to the discussion of the universality action plan, another participant noted that activities by states parties and the Secretariat used to be disconnected but that this has changed, in part because of greater involvement by regional organisations, including the African Union and the Organisation of American States. It was added that such assistance has also been useful in some cases in informing countries about what their obligations are once they join the Convention. Another participant agreed, noting that it was a good policy choice to start working on implementation assistance with states not party before they even joined the Convention. With regard to demarches by states parties, there was some discussion as to whether they have been useful or not; it was argued that they have been. It was added that universality is slowly being achieved by focusing not on the disadvantages of joining, but by going through regional organisations and emphasising the importance of the Convention

and of adhering to it. It was noted, however, that the remaining states not party require a different approach. For example, one participant observed there has been little contact with North Korea and it will, therefore, be difficult to determine whether they will become a state party or not. It was added that, with regard to Egypt, things are changing in the Middle East due to Libya's accession to the CWC and Iraq's indication that it would adhere.

There was also some discussion about the pace of destruction. There was widely shared concern that the 2012 extended deadline for complete destruction of chemical weapons would not be achieved, but it was emphasised that the focus now should be on ways to help some possessor states parties with financial assistance and by stimulating the necessary political will for destruction activities.

The Biological Weapons Convention: Outcome of the Meeting of Experts, July 2004

A report was given on the Meeting of Experts, which took place in Geneva from 19 to 30 July 2004, under the auspices of the Inter Review Conference Process. The following two topics were on the agenda: (i) enhancing international capabilities for responding to, investigating and mitigating the effects of cases of alleged use of biological and toxin weapons or suspicious outbreaks of disease and (ii) strengthening and broadening national and international institutional efforts and existing mechanisms for the surveillance, detection, diagnosis and combating of infectious diseases affecting humans, animals and plants. The mandate of these meetings generally is to promote common understanding and effective action. It was noted that three background papers on mechanisms for disease surveillance, mechanisms for responding to disease outbreaks and mechanisms for investigations of alleged use and for assistance had been prepared by the Conference Secretariat. However, there was no mention of the CWC and its mechanisms for investigations of alleged use.

BWC states parties are continuing to take a close look at the threat of use of biological weapons and must consider their use by non-state actors and those outliers that have yet to join the BWC.

It was observed that there were representatives from 87 states parties, along with delegates from WHO, FAO and OIE. NGOs were able to make statements at an informal session and 83 working papers were submitted to the Meeting. The outcomes of the Meeting included chronological lists on each topic of considerations, lessons learned, recommendations, and conclusions, which were attached to the Meeting report as Annex II. It was noted that this annex would lay the groundwork for the Meeting of States Parties, which took place the week after the Pugwash workshop.

In response to this report, there was some discussion as to why the CWC was not mentioned in the Conference Secretariat's third briefing paper on mechanisms for investigations of alleged use but it was generally agreed that the Meeting was successful. One participant noted, in particular, that he was encouraged by the quality and level of participation and that the Meeting met its mandate. It was added that BWC states parties are continuing to take a close look at the threat of use of biological weapons and must consider their use by non-state actors and those outliers that have yet to join the BWC. It was added that although use of biological weapons by non-state actors is not explicitly addressed by the BWC the Final Declaration of the Fourth Review Conference had recognised that this could be dealt with through proper implementing legislation, which was also discussed at the 2003 Meetings. It was also noted that the participation of IGOs throughout the 2004 Meeting, i.e., WHO, FAO and OIE, was purposeful because their activities informed topics of discussion at the Meeting including disease outbreaks, distinguishing between natural and manmade outbreaks, and responding to such outbreaks.

Another participant observed that there was a significant amount of discussion at the Meeting on biosurveillance but that there was little in respect of investigations of alleged use. He added that improving biosurveillance is necessary and that international organisations must be involved in this process, nevertheless the problem lies in what to do with such a system: to use it to protect populations or to use it in the field to determine, for example, whether biological weapons have been used. On a different note, a growing lack of coherence was noted in respect of how the international community is responding to bioterrorism, including UN Security Council resolution 1540

and efforts by the G-8, and a reintegration of these efforts within the BWC framework was encouraged.

There was some discussion on this latter point. One participant queried whether the BWC should be the central point for countering the threat of bioterrorism and if the matter should be looked at from a wider perspective, including UN reform. Another noted that international cooperation is already underway and includes such initiatives as PSI, 1540, CSI, EU programmes, etc. In other words, many countries have moved beyond the BWC format. In response, it was noted that this may be due in part to the lack of an international organisation to implement the BWC.

International CBW Criminalisation

The status of the criminalisation project was briefly discussed. It was noted that there was a preparatory meeting in Sussex in anticipation of a conference in The Hague possibly involving the Hague Academy of International Law to promote the criminalisation convention. It was also noted that a commentary had been prepared and that it was being finalised for publication, but that the impact of UN Security Council resolution 1540 would still have to be taken into account.

The BWC New Process

The workshop participants revisited one of the topics discussed under the auspices of the 2003 Inter Review Conference Meetings, namely, national implementation of the BWC, including penal legislation. It was noted that many states parties still lack basic implementing legislation as required under Article IV. It was added, however, that eleven states parties had offered assistance and, more recently, VERTIC and the ICRC had drafted a checklist and model law to implement the BWC. The model law incorporates provisions from several states parties' legislation, elements of the OPCW *National Legislation Implementation Kit* and elements from UN Security Council resolution 1540. It was noted that the model law targets small states with no biotechnology industry and with common law systems, and that it is intentionally simple and can serve as a framework for further measures if necessary.

A presentation was given on UN Security Council resolution 1540, adopted in April 2004, and its impact on the BWC and the CWC's states parties. It was first observed that the resolution is binding on all UN member states, whether parties to the BWC or CWC, or not. The resolution requires states parties to report on the status of its implementation: 90 out of 191 UN member states had done so by the time this presentation was given. Some concerns about resolution 1540 were noted including: the Security Council acting as a lawmaker in adopting the resolution; its adoption under Chapter VII of the UN Charter which suggests that there will be repercussions if states do not, for example, file their reports or file inadequate ones; and nuclear, biological and chemical weapons being lumped together. In response, it was observed that resolution 1540 raises a barrier to terrorists in their attempts to obtain nuclear, biological and chemical weapons and will encourage states parties to join the CWC and BWC. On the other hand, it was observed that effective and comprehensive implementation of the resolution may take around five years. There will also be the problem of UN member states being in varying levels of compliance with the resolution. Nevertheless, it was noted that, at the very least, the resolution requires BWC states parties to do what is already obligatory, i.e., to implement it at the national level. What is novel about it is that it requires non-states parties to implement legislation which hitherto only CWC and BWC member states had to adopt.

Second Meeting of States Parties, 6–10 December 2004

Enhancing international capabilities to respond to alleged use or suspicious outbreaks

A presentation was given on investigations of alleged use under Article X of the CWC and, more generally, on OPCW assistance and protection activities. A description of current activities was given including national capacity building as well as capacity building at the institutional level in the OPCW. It was noted that a decision had been taken by the Executive Council on a new format for submissions of information on national protective programmes (at its twenty-fourth meeting, 24 November 2004), that a databank on national protective programmes was being developed and that there were projects underway, including at the regional level, to help states parties build national and regional capacities in respect of protection. It was added that some of the regional projects have a three-year timeline. Training for first responders was also discussed including events in Saudi Arabia, ASEAN member states and Central Asia. With regard to institutional capacity building, it was observed

that the OPCW is developing its international response programs and programs for delivery of assistance.

Turning to investigations in particular, it was noted that procedures under Articles IX and X take into account those used in routine inspections, however, it was emphasised that investigations of alleged use differ. It was noted that the UN Secretary-General can request help for allegations involving states not party. Investigations may involve chemical and explosive ordnance reconnaissance and environmental and biological/chemical sampling and analysis. However, it was observed that the OPCW's capacity at this time is limited in respect of biomedical sampling and analysis. It was added that there are labs that undertake this work but there is no Conference decision as of yet on this matter. Another aspect requiring further work was identified, namely, the ability to interview witnesses and casualties including, in some cases, refugees. It was noted that more work also remains to be done on fine-tuning command post operations but that work has been done in respect of administration and logistics support. The need for more work, however, on support in the event of a terrorist attack was stressed. Particular attention was brought to the insufficiency of available equipment and facilities used in routine inspections for investigations of alleged use; rather, what is needed are pre-packaged modules. It was also noted that the OPCW Technical Secretariat faces problems with regard to the export of dangerous goods necessary for some investigations and lacks enough money to do real-time exercises: the current focus is on scenarios, and new ones need to be developed. Lack of qualified experts was noted, including those trained in forensics, biomedical sampling and analysis, and crisis management. Turnover of staff was noted as one cause of this and as being detrimental to the Secretariat's capacity to carry out investigations of alleged use.

There was some discussion in response to this presentation, including on whether WHO and the OPCW cooperate and on whether the OPCW would be able to respond to chemical weapons attacks in countries beyond Europe. It was also queried whether assistance should, therefore, be centralised or regionalised. One participant stressed that the tenure policy was a grave mistake in light of the impact that it was already having on assistance and protection activities. In response, it was noted that there is some WHO/OPCW cooperation but that it is ad hoc and unstructured. Another participant noted that investigations of alleged use have public health implications and this implicates WHO, but that it should not undertake investigations and, in many cases, lacks the necessary technical resources to respond to alleged use of chemical, or for that matter, biological weapons. It was also observed that requests for assistance from WHO should in many cases be directed towards the OPCW and vice versa and that there is similar lack of coordination within governments. In response to the comment that assistance and protection should perhaps be regionalised, it was noted that there is a two-track process underway whereby the OPCW is helping states parties develop their own national protection capacities while also working on its own institutional capacity. With regard to the tenure policy's effects, it was observed that by the end of 2005, the Technical Secretariat will be devoid of expertise in this area. In addition, it was noted that there is an understanding now that there must be assistance and protection activities involving chemical industrial facilities. Allegations of chemical weapons use in Darfur were briefly discussed, however, it was observed that little more could be said about the matter at this time.

Strengthening national and international efforts for surveillance and combating infectious diseases

It was observed in the first paper presented under this topic that a possible role for UNMOVIC, in implementing the BWC in the absence of an OPBW, might not be possible. Rather, it was argued that it would make more sense now to set up a body through the UN General Assembly and put it under the Secretary-General's control. This way all UN member states would have a say on the matter and have the option of using it for issues that are not necessarily related to international security, for example, clarification. It was added that there would be no conflict with the OPCW or CWC, rather, this proposal would only be filling a gap in the BWC regime. It was noted that the United Kingdom made a proposal to the Meeting of Experts in 2004 to strengthen the power of the Secretary-General to authorise investigations of biological and chemical weapons use. Regarding biological weapons use, in particular, it was observed that there would have to be certain criteria in place regarding training, geographical distribution and confidentiality arrangements, and that there would have to be equipment under the control of the investigating body and a body which

would be ready to go on mission on short notice. It was noted that, at the moment, the UN Secretary-General has the authority to act but no funding and that there are no standing arrangements for an inspections body; the UK proposal would correct this. It was also noted that a General Assembly resolution was recently adopted which sets up a panel in 2006 to explore verification and the UN's role in it.

A role for the Security Council was discussed: it could make use of the body described above if there was a threat to international peace and security. It was also noted that the Security Council should, in light of the recent UN reform report, take advantage of the Secretary-General's roster of experts for biological weapons-related matters.

Another issue that was discussed was how such a body would avoid undermining the IAEA and OPCW. It was noted that the UN Secretary-General can already call upon inspectors, as he did for Iraq, who function independently of the weapons treaties and their respective institutions, and who can conduct significantly more intrusive inspections. The focus, of course, would be on biological weapons because there is currently no OPBW nor other standing arrangements in place for verification of the BWC. It was added that having such arrangements would be a deterrent and an alternative to military action.

One participant raised the issue of how verification of the BWC would be achieved, whether through UNMOVIC or through the Secretary-General's rosters of biological and chemical weapons disarmament and verification experts. It was observed that, on the last point, the Meeting of Experts recommended updating the General Assembly resolution 42/37 lists of labs and experts. On the other hand, it was observed that it was unlikely UNMOVIC could accept the mandate of BWC verification. Another participant agreed, noting that UNMOVIC and UNSCOM were set up for specific purposes, and adding that it was necessary to distinguish between alleged use and assurance of compliance. He added that the IAEA and OPCW give assurances of compliance with regard to nuclear and chemical weapons and that a similar mechanism is needed for the BWC. Other participants argued that it was important to preserve UNMOVIC's capacity in respect of biological weapons-related inspections, especially in the event that a state is uncooperative and intrusive inspections are necessary. Another noted that UNMOVIC's verification expertise was broad and that there is no other body of experts with this integrated knowledge, but the question remains of how to keep it alive. It was added that arguments against a standing inspection capacity were undermining the NPT and CWC regimes with their own inspection teams for nuclear and chemical weapons. On the other hand, it was observed that a standing regime with intrusive powers beyond those of the IAEA and OPCW teams, in respect of nuclear and chemical weapons, would not be supported by states parties. It was generally agreed that the focus should, therefore, be on creating an institution for inspections related to biological weapons.

In response to all of these comments, it was noted that (i) a new body for biological weapons-related inspections is needed because there is not one at this time, (ii) UNMOVIC cannot continue indefinitely because it does not have a mandate to do what is needed in this area, and (iii) it would be advisable to start with the Security Council and Secretary-General because they already have the authority to order inspections. The Security Council, for example, could authorise an inspection under Chapter VII of the UN Charter, demand compliance, and enforce measures in extraordinary circumstances. It was added that there could be a small biological weapons-inspection body limited to alleged use, but having the capability to train existing inspectors. In practice, it could consist of a small permanent staff that can call upon experts with appropriate expertise who are trained to work together and take a multidisciplinary approach. Additionally, the body should be insulated from UN politicization; for example, it should not be under UNDDA control. In short, it was argued that this proposal could be part of an evolutionary process towards an OPBW until such time as one is established.

Another presentation addressed the 1948 Arab-Israeli war and alleged use of biological weapons. It was argued that allegations of biological weapons use are often unresolved in the absence of formal admissions in internal and international conflicts, even if there is an investigation. Examples were given of events that are still disputed including the alleged sabotage of water wells with disease-causing organisms by Israeli soldiers in Acre, near Haifa, and Gaza. It was argued that it is difficult to prove biological weapons use unless the perpetrators are caught in the act and that this is compounded by the fact that the act does not necessarily need to be complex. In response, it was noted that there is often a loss of facts dur-

ing wartime, especially in places where literacy is low and records are poor or not kept. It was added that there has been much progress since then, for example, information can now be obtained through forensic analysis.

Third Meeting of Experts and of States Parties, 2005

Codes of conduct for scientists
Considerable attention was given by the workshop participants to this topic, particularly because it will be the focus for discussion during 2005 in the context of the Inter Review Conference Process and related Meetings of Experts and States Parties. A brief presentation was given on the development of the ICRC's "Principles of Practice", which are directed towards individuals working in the life sciences. It was noted that the development of these principles is part of a broader ICRC effort known as the *Biotechnology, Weapons and Humanity* project launched in September 2002. The principles are intended to raise awareness among those working in the life sciences of the dangers of misuse of biotechnology and to make a link between legal and ethical norms and best practices in the field. A query was raised as to the definition of 'webs of prevention'. In response, it was noted that several actors, each acting with an awareness of the need to prevent the misuse of biotechnology, strengthens the overall effort. It was added that awareness of ICRC's "Principles of Practice" was being promoted through bilaterals with large companies, letters, meetings in Brussels, posters to labs, etc.

Another participant discussed an ethical approach to the dilemma of dual-use agents and technology that can be used for peaceful as well as harmful purposes in the life sciences. It was argued that religious and non-religious traditions, including tenets of Catholic social teaching, may influence the development of codes of conduct. It was observed that, whereas laws are hard and enforceable, ethics are personal and belief-based. It was noted, in particular, that it would be difficult for legislators to legislate ethical codes for life scientists given their unfamiliarity with the field, accordingly, such codes must come from scientists themselves. Turning to specifics, the participant noted that Catholic social teaching already provides several tenets which could serve as a basis for an ethical code in the life sciences, including the norm against killing, justification for defending oneself in the event of a just war, rejecting the arms race and terrorism, and promoting peace. It was observed that science and technology are not morally neutral, therefore life science projects should be evaluated based on, *inter alia*, ethical standards, and ethics should be taught to life scientists at an early stage. Participants appreciated that this approach considers values but emphasised that codes should also take into account the sensitivities of some societies. Other participants cautioned, however, that a multicultural approach to codes of conduct could be complicated and create tension between different groups or, alternatively, such codes might offend by imposing one particular set of beliefs or be too flat for fear of offending. In response, the speaker noted that development of codes of conduct should be open to debate. With regard to the problem of imposing one set of values on others, it was noted that the Catholic church does not consist solely of practitioners from the West and that input from other religious traditions would be welcome.

A presentation followed on a practical approach to codes of conduct. In particular, it was suggested that Recommendation 21 of the UN working group on the UN and Ter-

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rorism be taken into account, which addresses codes of conduct for scientists engaged in work relating to weapons of mass destruction technologies. The aim of this proposal would be to ensure that activities involving biological toxins and agents are used for peaceful purposes in line with the BWC's general purpose criterion. Target communities would include academia; the public, animal and plant health communities; industry; and government. It was observed that it would be unrealistic to assume that there will be a new code of practice in respect of dual-use biotechnology, rather, existing requirements could be integrated into rules for the life sciences. Examples of existing codes in the United Kingdom that could serve as models were also noted, including those for health and safety at work (especially risk assessment procedures), protection of the environment, export control, and animal experimentation. It was added that international regulatory frameworks should be considered, for example, EU regulations. In conclusion, it was noted that this practical approach focuses on whether certain activities are lawful, while picking up considerations in respect of nuclear, biological and chemical weapons and with the added benefit of being cost-effective. Participants noted that what may be best practice in the United Kingdom may differ elsewhere. The problem of inadvertent activities, which could be enormously destructive, was also flagged in light of the BWC's general purpose criterion. It was suggested in response that there should be an ethical review process whereby life scientists' work is reviewed to determine whether it is harmful in or out of the lab or has hostile purposes, and that this would satisfy the requirements of the general purpose criterion which only permits peaceful uses of biotechnology. Another participant noted that different contexts raise different legal issues but that, ultimately, biodefence and industry, in addition to inadvertent and advertent activities, must be covered by codes of conduct.

Related to this final point, a presentation was given on how codes of conduct should be informed by biodefence considerations. As an initial matter, it was noted that scientists must follow processes that confer legitimacy on the programmes they work on. It was added that this requires review, a search for truth, and scepticism. As a practical matter, biodefence codes of conduct must be informed by threat and risk assessment. In addition, the operational response framework must be considered, which covers everything from known or anticipatable agents and agents falling in a grey zone, to unknown or novel agents. It was explained that known or anticipatable agents are predictable and exist within a limited threat space. Unknown agents, on the other hand, are unpredictable and the threat space is infinite. It was added that the lead time for responding to known agents is long, agents in the grey zone can create trouble, and one cannot plan or prioritise responses when unknown agents are involved. Rather, generic responses with a short lead time have to be developed but it was noted that such a system, regardless, could be beneficial for public health purposes. For the moment, it is simply too expensive to move unknown agents into the slightly more manageable grey zone. The speaker observed that threat assessments must include identifying threats in order to develop countermeasures. At the moment, however, there is a gap between what can be dealt with today and what may arise tomorrow, even though threat assessments must be accurate and reliable. It was added that certain agents, in particular, will require advance lead time but, in respect of their use by terrorists, there is still time to address the matter. It was also observed that codes of conduct will be a crucial part of this process. In conclusion, it was argued that if the knowledge gained by studying certain agents will have a positive impact on biodefence then it could be pursued. However, it was argued that there should nevertheless be a strategic and operational framework which forces life scientists to think through the entire process.

Different contexts raise different legal issues but ultimately biodefence and industry, in addition to inadvertent and advertent activities, must be covered by codes of conduct.

In response to this presentation, it was first argued that there is a tendency to exaggerate threats. It was added that certain kinds of attacks are hypothetical but that, nevertheless, we must consider the probability that a certain event will happen and consider whether the people we are worried about have the capability to carry out worrisome events. Another participant noted that threat assessments differ in different countries and that this influences the kind of work that is undertaken. It was

observed, for example, that in Sweden small programs are looking at real threats whereas, in the United States, threat analysis tends to be governed by politics which then affects government scientists and their work. In light of this, it was added that discussions of threat assessments are truly difficult in multilateral contexts. A participant observed that institutional review boards already exist in the United States and that there are available models in the Departments of Defence and Health and Human Services for the life sciences. In response, one participant noted that there is much more money in the United States for work in the life sciences so less attention is paid to threat assessments, in contrast to the situation in Europe where careful thinking must come first. Another participant also responded by noting that a large amount of money is going to biodefence, sometimes at the expense of public health and that many scientists simply follow the money. It was added that review boards are largely inactive in important labs in the United States. With respect to codes of conduct, in particular, it was noted that the governments funding the scientists should also be subject to their standards and that it was unfair to direct them just against scientists interests'. In response to these comments, the speaker agreed that the root of the problem internationally is that threat analysis differs throughout the world. So, for example, a US solution is needed for US problems. He also agreed that institutional review boards are weak right now but could work if they functioned in the context of codes of conduct.

A presentation was given concerning a survey of institutional biosafety commissions in the United States. It was noted that these commissions operate under guidelines not law, yet they review bioresearch and biosecurity projects. The survey was undertaken in light of a recommendation by the National Academy of Science, with an initial focus on the commissions' transparency. It was noted that 90 per cent of the registered commissions were asked to complete the survey and then asked to comply with biosafety guidelines. However, it was observed that very few of the commissions responded to the survey even though their records must be made public to be eligible for funding. It was added that, in some cases, this was because the commissions simply do not exist or do not meet if they do. In short, it was observed that this system of biosafety commissions has been in existence for some thirty years and has been charged with overseeing dual-use bioresearch, but it does not function well at all. Several examples of this were provided including meetings at which no minutes were prepared and commissions that met for the first time in response to the survey. Other commissions had only met once, agreed to meet again, and never did. The speaker described the conclusions drawn from the survey including: the recommendations of the National Academy of Science must be implemented because the system is in disrepair, this voluntary system is stronger than codes of conduct but many institutions do not use it even though they have been directed by the National Institutes of Health to release information, the lack of lab biosafety laws in the United States is untenable, and the guideline system is not working.

A paper was presented next on how scientists will have to take the initiative in regulating themselves, including applying ethical practices, in light of the explosion of activity in the life sciences and the dual-use nature of biotechnology. The speaker's reservations about ethics were noted, however, including concerns about who is the ultimate authority in this area and different cultures having different moral principles. A problem-oriented approach was proposed, based on a model by Wölfgang Binder, whereby the life scientist makes an assessment of the aims and benefits of his or her work and based on a set of rules. To take vaccines as an example, their development is legitimate but one must also look at the means used in developing them to obtain a greater safety model. Accordingly, if there are devastating effects as a result of developing a certain vaccine, it must be rejected even though there may be some benefits. On the other hand, the risk of abandoning the project must be weighed, especially if that risk is greater than the one posed by continuing the experiments. Practically speaking, it was argued that licensing of all facilities and scientists working with potential biological warfare agents is necessary, and that periodic inspections would also be appropriate. It was added that all scientists must receive training on the BWC and on models for decision-making. In other words, licensing programs should not just address biosafety but also the requirements of the BWC so that scientists are aware of their responsibilities during the course of their projects. In response to this presentation, a workshop participant observed that many scientists feel that they have little opportunity to make individual decisions because they are part of

large research programmes, and that they must excel to ensure career recognition and to make money. In other words, it was suggested that individual experiments should not be the only consideration here.

The next presentation under the topic of 'Codes of Conduct' emphasised that the overall aim of standard operating procedures (SOPs) for labs should be biosafety and biosecurity. It was noted that SOPs have already changed in labs because of a heightened threat of misuse of toxins, organisms and other dual-use biotechnology. It was added that codes of conduct can be beneficial, but that there must also be regulations with sanctions for violations thereof. The speaker observed that the biosafety framework in the United States, in particular, emerged out of work on the matter in the 1950s. It was, therefore, suggested that the wheel should not be reinvented in 2005 during the Meetings of Experts and of States Parties. It was also observed that the framework for biosecurity is already contained in Article I of the BWC, i.e. the general purpose criterion. In light of these considerations, it was suggested that from this existing framework the focus should be on duties, and that anything less might imply that there is some question as to the agreement on the universality of the norms against chemical and biological weapons.

In response, it was noted that a framework based on moral agency assumes that nothing goes wrong. It was also argued that the US model is a failing one, yet is being promoted in other countries. Another participant gave a lengthy intervention, starting with the observation that in 2005 the mandate of the Meetings will be codes of conduct for scientists, not codes of conduct for scientists doing biodefence work. It was added that the issue may be informed by inputs from highly regulated developed States Parties but that areas needed to be identified requiring self-regulation by scientists. Turning to what might be discussed at the Meetings in 2005, it was observed that the States Parties have different approaches on the legal aspects of codes of conduct, as well as wide versus narrow views of them. In particular, it was noted that if the discussions focus on practice versus conduct, no decisions will be reached. It was added that there will be no progress if the discussions start from the point of view of ethics nor if they focus on who will be subject to the codes. It was stressed that the Meetings must be pragmatic and its results must apply to all those involved with the life sciences, up to and including CEOs of companies setting up dual-use biotechnology projects. It was added that the codes must be informed by scientists' views, including an understanding of whether what they are doing is wise versus whether it is allowed, which is more of a legal issue. The notion of whether a particular project is wise requires a scientist to determine whether a project is beneficial or not. It was argued that, practically speaking, the discussions should not be focussed on top-down approaches (government initiatives) but rather on bottom-up approaches (scientist and industry initiatives). In other words, governments should take notes, take them home and let scientists and industry sort out how they should proceed. It was added that it would also be useful to make scientists and industry representatives aware of their duties and for them to come to the 2005 Meetings. In short, the workshop participant proposed a basket of approaches, addressing ethics, the legal framework, and codes of conduct.

Several other participants continued to discuss this matter. One noted that codes of conduct have their limits and are not a panacea, rather, they should only be one part of several measures. It was added that the entire situation needs to be looked at from an ethical point of view, that is, is it ethical to develop biotechnology for harmful purposes or to protect one's country? The participant also raised the issue of how to bring the message to the appropriate targets, for example, through education with UNESCO playing a role or through ISO standards for labs. In response, a participant noted that both ideas have been looked at but the relevance of the BWC to UNESCO and the ISO was unclear. It was suggested that education should begin with states parties. Another participant agreed that ethics play a major role in the process, noting that they do not always differ from one group to another nor necessarily have to start with religion. There was agreement from others on the latter point. He added that ethics and codes of conduct must come from within a community and not be imposed from the outside, and that the process starts with training and getting life scientists to think about the consequences of what they are doing. In response to this point in particular, one participant noted that some scientists are a long way from recognizing that there is even a problem.

Some participants turned to mechanisms versus processes, arguing that codes of conduct should be looked at from both points of view, that is, from outside in and vice

versa. Another participant noted that it would be problematic for scientists to define standards for themselves because this would lack a context, which codes need. It was added that codes are broader benchmarks for a process and that they cover those matters that cannot be regulated, whereas regulations are tightly defined and, once promulgated, are hard to change. Thus, codes are just one part of the process and education about codes is another.

One participant argued that the issue should be looked at from an economic point of view, that is, biotechnology as a 'service' with clients and providers. He added that because marketplaces are inherently amoral, codes of conduct will be trumped by the marketplace even if the codes are desirable, and that they only increase the value of the 'services' by reducing the available supply. He concluded that there must, therefore, be a system of sanctions to back up the codes. Another participant observed that one fundamental issue the BWC states parties could talk about is what is legal and illegal under the BWC. She noted, however, that they have yet to reach an agreement on this and cannot, therefore, possibly ask scientists to behave in certain ways in conformity with codes of conduct. In other words, scientists cannot do their work without governments doing theirs first.

The speaker on the final paper under this topic argued that the focus of codes should be on addressing the gap in regulations for the conduct of research. It was added that there are ethical codes, codes with voluntary guidelines and codes of practice with enforceable requirements: each of these types of codes are distinct but interrelated and needed. It was noted that, in response to the threat of terrorism in the United States, experiments of concern, including DNA experiments, have been added to National Institutes of Health guidelines for research related to biotechnology. It was also noted that a new biosecurity panel will be established under the guidelines, and that they establish national and local oversight and codes of conduct. The speaker observed, however, that these guidelines are only voluntary and consciousness-raising but do not go far enough because certain industries and government research (including classified research) are excluded, which are two key sectors of the life sciences community. It was added that the guidelines are only advisory, not legally binding, and do not address the international angle of this problem. The speaker argued for a comprehensive, mandatory, binding and global set of uniform procedures and standards with licensing and peer review of experiments before they are undertaken. The system would build on existing institutions and be a tiered system with a national review board as well as an implementing body at the global level to oversee the most dangerous work, similar to WHO's oversight over smallpox research in the United States and Russia. With regard to codes of practice, the speaker noted that the mechanisms to prevent terrorists from misusing biotechnology are overstated, rather, the greater threat is inadvertent damage, arising out of great advances in science. Accordingly, though codes of conduct would be consciousness-raising, the codes of practice described above would be part of a binding and enforceable system.

Codes are broader benchmarks for a process and cover those matters that cannot be regulated, whereas regulations are tightly defined and, once promulgated, are hard to change.

In response, it was noted that the proposal above is limited to pathogens/infectious disease agents but that some things, for example, the agent used in the Moscow theatre, do not fall into this category. In other words, the proposal appears to be more about controlling dangerous research. Another participant noted that the proposal seems more concerned about inadvertent rather than deliberate consequences. Accordingly, it was queried why we should be concerned about terrorists if they cannot do this work. With regard to peer review in particular, it was noted that it only looks at the science but not necessarily the broader biosafety/biosecurity context. Another participant agreed noting that scientists' estimation of risk differs from that of other people and that peer review may not necessarily be useful as a consequence. It was added that what is needed are denominators of risk, that is, a determination of how many people have nothing to do with biodefence work or are working on select agents. It was observed that the other problem is how to have effective constraints on research when science and industry are international and so many governments are involved, especially if there is no transparency at the state level. The speaker responded to these comments by first suggesting that whether industry will opt into the guidelines is

an open question but that the National Institutes of Health has said that they will become mandatory if they do not. On the question of whether the proposal covers research using nonpathogens, it was noted that as the proposal develops, the process needs to be adaptable to new threats. The speaker confirmed that the threat of terrorists using existing knowledge for harmful purposes was less likely than new knowledge being inadvertently and wrongly applied. With regard to the comments about peer review, it was observed that scientists must play a role in this process but that oversight would have to involve other actors as well. Finally, it was noted that the dual-use problem is not limited to biodefence work alone, and that an international response to the dual-use problem could include codes of conduct as well as internationally agreed rules and procedures, perhaps in the form of a treaty, with obligations that states parties must implement nationally.

Towards the Sixth Review Conference and Beyond

Is the dual-use problem changing?

The first paper under this topic discussed the overriding need for full transparency to ensure biosecurity. It was noted that people are placed at greater risk if there is little or no transparency along the biosecurity chain. Some initial observations were made, for example, it was observed that biological weapons are different from nuclear and chemical weapons because they are associated with disease and temporal delay. It was added that there are institutions to protect public health against disease but that this is not true for chemical or nuclear weapons. It was argued that, accordingly, there is something about biological weapons that goes against the essential value of life sciences being for the benefit of humanity. Turning to the paper, the speaker noted that secrecy in respect of dual-use biotechnology is simply wrong. Examples were given, including experiments by the Japanese in China which had negative consequences for the Chinese. As a result of the secrecy surrounding the experiments, however, their claims were not considered legitimate after the fact. Other dangers were pointed out, namely, the manipulation of information to obscure threats or the manipulation of threats. It was argued, for example, that information regarding the anthrax letters event was manipulated by the government, obscuring the threat to postal workers and others. It was argued that the government also manipulated the smallpox threat using fear, leading to a call for vaccinations. A website developed by students, in response to the construction of a biotechnology lab at Boston University, was discussed as an example of ways to promote transparency in this field. This was considered especially important in light of scientists' naïveté with regard to accidents in labs and the hazards of doing classified work. In concluding, the speaker observed that disease models elicit complex responses which cross organisational boundaries, including the health, military, and intelligence fields and that these organisations also have possible international linkages. It was emphasised that the public can be placed in jeopardy if vital information is distorted or hidden. It was argued that comprehensive efforts at transparency are therefore needed among the CDC, the FBI and other intelligence agencies, and local communities to reduce risk at every juncture. A participant responded by noting that scientists tend to underestimate risk and queried whether it was wise to let them do the decision-making on their own, particularly because they stand to gain from their own risk assessments. The speaker agreed, and added that they do not see the consequences nor the career implications of doing classified work.

The next speaker observed how the dual-use problem has changed the regulatory landscape such that the object of control now is technology, versus weapons, and the actors subject to these measures are not traditionally associated with security issues. It was added that the questions that arise are whether these actors are being addressed correctly and if the concept of 'dual-use' is being clearly explained to them. It was noted that the paper was part of a larger work focusing on technology studies, which reconceptualises the relationship between technology and science. In other words, technological development is a complex activity with links to science. It was observed that technology can be seen as having three interacting parts: the *physics of the artifact*, which determines how technology behaves; an *imposed function* that guides people's interactions with the technology and determines how it should behave; and a *technological regime* within which the other two parts operate. An example was given of the CD, which can be used for different, even unintended purposes, accordingly, the change in use is associated with intention and the key is the appropriateness of the use. The speaker argued that if the dual-use dilemma is translated into the technology debate there are parallels, however, technologists do not see dual-use as an inher-

ent property. That is, they do not perceive that technology can be automatically used for weapons purposes, rather, it depends on the context such that technology can be used for good and exploited, or for bad if banned and proliferated.

Another paper was given under this topic on whether risk assessment can be a useful method for governing dual-use research. It was asserted from the outset that risk assessment can be useful if its limits are recognized, and that it is only one tool among others. It was noted that the paper looked at dual-use in context and offered a definition of risk. Risk assessment, in particular, was defined as a way of looking at how to manage risk, including giving risks a value in order to rank and compare them. It was observed, however, that these values cannot be scientifically proven. It was noted that the question of how to harmonise risks arises from the results of risk assessments. Practically speaking, risk assessment requires an analysis of the nature and location of the risk in question, the probability of the risk occurring, vulnerability, and the resources with which to manage the risk. Lack of data was highlighted as a potential problem in respect of the probability element. On the other hand, it was noted that analyses of vulnerability and the resources to manage risks are fairly easy to determine. Alternatives to risk assessments were noted including vulnerability studies and scenarios. The speaker concluded by noting that risk assessment can be a useful tool for policy makers, especially because it highlights gaps in respect of addressing dual-use technologies. The limits of its usefulness were nevertheless emphasised.

Participants had several comments regarding the previous two presentations. With respect to the argument that technology is neither inherently good nor bad, a participant observed that the intent underlying biodefence work in the United States could always be claimed to fall under Article I of the BWC. He added that using dual-use technology for beneficial purposes is a matter of trust, accordingly, it would be useful if scientists could build this trust. On a final note, he observed that the legitimacy of risk assessment is questionable because it cannot be separated from politics. Another observed that we have moved from a century of development to a cornucopia of dual-use technology, and that the problem is not just a single experiment but entire programs, including ones that should not be pursued. In response, the first speaker noted that if we do not assign the properties of good and bad to technology, we have to look at context and intent. It was argued that a good way forward, from funding to the end of the project cycle, would be to assess context, use, and intention. The second speaker agreed that risk assessment models could work at the research program level, not just at the level of the discrete experiment.

What outcome would be regarded as successful?

Several papers were presented on this crucial topic. The first speaker observed that the first four review conferences successfully adapted themselves over the years to address the important issues at the time. On the other hand, it was noted that the Fifth Review Conference, held in 2001 and resumed in 2002, was focussed on rescuing the BWC regime and concluded with five topics for discussion during the intersessional period, known as the New Process. A brief description of the Inter Review Conference process, including the Meetings of Experts and of the States Parties, was given. The question was also raised of how successful these meetings have been so far for discussion of each of the topics and promotion of common understanding and effective action. It was observed, for example, that the language in the Fourth Review Conference document regarding the implementation of penal legislation was stronger than that in the document arising out of the 2003 Meetings, and that there was no action plan for national implementation of the BWC similar to the OPCW's. The speaker noted, however, that there was real promise for a positive outcome at the 2004 Meeting of the States Parties, based on the Meeting of Experts document, as well as for the 2005 Meetings (Codes of Conduct). The speaker asserted that the Sixth Review Conference needs a final declaration to reaffirm and further extend common understandings and that a failure to do so would erode the BWC regime. He added that an institution is needed to carry the regime forward because it needs strengthening, and

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that there was a need for a legally binding instrument to strengthen the effectiveness and improve implementation of the BWC. He acknowledged, however, that there is still some tension in respect of these matters. Turning to planning, the speaker asserted that stakeholders must start thinking now about the Inter Review Conference process outcomes, confidence-building measures (CBMs), and a legally binding instrument. He added that there must be early consideration of several outstanding issues, that the states parties' political commitment of 1998 must be recalled, and that there must be a contingency plan in case the Sixth Review Conference is unsuccessful.

In the second presentation, it was observed that a successful outcome to the Sixth Review Conference depends on where you stand, for example, from within the US or UK governments or from the point of view of an NGO. He added that events between now and 2006, including individual agendas, will shape matters. For example, CBMs were successful because they were planned by some states parties. The speaker argued that a line needs to be drawn under the past and that mention of the Protocol, a legally binding instrument or international negotiations on these topics could be problematic. On the other hand, he observed that there are still available options and that it would be impossible to dodge negotiations on a 2006 Review Conference declaration.

A third speaker under this topic observed that the Inter Review Conference process has been an interim 'something' but that there is still no progress, for example, on national implementation of the BWC (although he added that adoption of UN Security Council resolution 1540 may speed things up). He asserted that the European Union and associated and like-minded states parties must outline a constructive and realistic way forward, starting now, with the help of the NGO and scientific communities. It was added that there must be support and a continued process for meetings where groups of states parties can identify and evaluate measures to strengthen the BWC, for example, a VEREX-like group, which could take into account new initiatives and how they relate to the BWC. He added that these measures must be evaluated in order to determine which would fit in the BWC framework and which could stand alone. These might include: reviewing work on legislation, evaluating progress on Article V and how to make the consultation process work, possible revision of CBMs, the establishment of a scientific advisory panel, assistance and protection in the event of use by non-state actors (taking into account what WHO is already capable of doing), and work on establishing an OPBW preparatory commission. Complementary measures were also suggested or confirmed including those in respect of national oversight, a CBW criminalisation convention, a biosecurity convention, industry involvement, a verification mechanism under the UN Secretary-General, work under resolution 1540, surveillance of disease, PSI, biosafety regulations, and licensing. With regard to CBMs, in particular, it was suggested that electronic filing could be considered, the poor numbers of returns should be addressed, and perhaps some of them could be made mandatory. In concluding, the speaker emphasised that there must be a Sixth Review Conference declaration which points the way forward, including, at the very least, formal meetings, mandatory and new CBMs, and a processing unit for declarations.

In response to these presentations, a participant observed that all of the proposals were good. However, he observed that following the 2001/2 Review Conference, efforts were driven by concerns about anthrax attacks and terrorism and became a highly fragmented process. He argued that stakeholders must go back to see how activities surrounding the BWC can be integrated into it. He added that if this is not successful, what is left must be evaluated, namely Article I and its preservation in the face of changes in biotechnology and what has already taken place under the auspices of biodefence. With regard to national implementation of the BWC, he asserted that resolution 1540 does not let this work take place within the context of the Convention. He also observed that it will be difficult to continue with CBMs if there is not agreement on them already. A participant disagreed that BWC activities were taking place in other fora and that what has happening under resolution 1540 was unclear, but the Review Conference could comment on whether states parties were in compliance with Article IV. Another participant argued that the focus of the Sixth Review Conference must be on the minimum so that it does not collapse. She added that annual meetings could be useful. The possibility of a modular approach to implementation and verification systems was raised, including a BWC technical support unit set up outside the treaty regime, which could assist with universality, implementation, coordinating meetings,

and serving as an information clearinghouse for all BWC states parties. She added that such a body may not be necessary as a result of resolution 1540. However, she noted that it could be a modest start for institution building.

Another participant noted that discussion of a legally binding instrument at the Sixth Review Conference was not completely unreasonable because there was willingness to discuss it before July 2001. It was suggested that, alternatively, negotiations on sensitive topics could take place elsewhere if not at the Review Conference. The participant added that a list of agents to be controlled could be the basis for a decision. Another participant noted with approval that civil society was ahead of the states parties in respect of carrying the BWC regime forward, but observed that at least there was some multilateral process in place for the time being, i.e., the Inter Review Conference process. He added that some state parties would have liked to put a verification mechanism on the agenda for the Review Conference and that there was disappointment over the failure of the Protocol, but that resolution 1540 may have imposed some limits on what can be done for now. It was suggested by a participant that perhaps it is not a bad thing that biological weapons issues are moving away from the BWC to where the power is, and that it is critical that the Sixth Review Conference strengthen the norm against misuse of dual-use biotechnology. In response to this comment and concerned about the fragmentation of the BWC, a participant observed that it would be useful to have a body such as the DDA to house offers of assistance, including regional and bilateral offers. Another participant raised the question of what will be discussed at the Sixth Review Conference in respect of the Inter Review Conference process, and queried what the point would be of meetings after the Conference if nothing arises from the intersessional Meetings. It was emphasised by another participant that there are certain things that must be done before the Sixth Review Conference, including the reaffirmation of the BWC's basic prohibitions and political action by states parties willing to take the risk, as well as more publicity about the BWC and the upcoming Conference. He suggested that it is too early to predict what the Conference will look like, but that it would be a good idea to develop several action scenarios.

Turning in particular to the impact of the Protocol's collapse in 2001, a participant observed that it was easy to blame the United States in the beginning for it but that, ultimately, all states parties were responsible. He recommended that the plenary session in 2006 decide on how to move ahead and not revisit the shadow of 2001. He also suggested that the results of the Inter Review Conference process be focussed on strengthening the Convention, and that the states parties must decide how they want to do this. Another participant agreed that there was a danger of the 2006 Conference being informed by what happened in 2001 and in assigning blame to one state party for the collapse of the Protocol. He agreed that a modular approach to strengthening the BWC regime would be acceptable, if voluntary. He added that it is in the states parties' hands in 2006 as to whether they want the BWC to be at the centre, or at the periphery once again as it was in 2001. Based on past practice, he suggested that the Sixth Review Conference review the BWC regime *in toto*.

How to deal with outcomes of the Inter Review Conference process?

A presentation was made under this topic on how to remedy the BWC's institutional deficit. The speaker observed that organisations are needed for practical reasons, such as to carry out those things states parties must do collectively, rather than what they can only accomplish at review conferences. He added that the BWC in fact needs an OPBW, but that it would be unrealistic to try to establish one at the 2006 Review Conference. Accordingly, he suggested that less ambitious arrangements are needed, perhaps a body that could carry out some of the proposals highlighted by earlier speakers, as well as older stream activities and those arising from the Inter Review Conference process. He observed, however, that such a confluence will not happen without care. Regarding the final declaration of the 2006 Review Conference, he noted that it may not be confined to products of the Inter Review Conference process, and that they would only be one set of many inputs. He added that the Review Conference should range over the entire BWC regime and that this should be reflected in the final declaration. Concerning results of the Inter Review Conference process, he observed that some states parties are already discussing annual meetings, and added that one topic for these meetings could be scientific and technological developments. It was noted that a scientific advisory panel might be useful for

enabling states parties to have early warning of threats to the BWC regime and that it could report to the annual meetings. As a fallback, the speaker asserted that a bureau could be authorised to hold open-ended meetings at its discretion, which would combine a nucleus of responsibility with breadth of participation. He added that efforts of the Conference Secretariat prior to the Sixth Review Conference should be consolidated into the Secretariat in the years following the Conference, short of turning it into an OPBW. Finally, he noted that the suggestions above would not require any kind of amendment process, rather, they are within the power of the Review Conference to adopt.

How to deal with unfinished business?

Confidence-building measures (CBMs) were the first item to be discussed under this topic. The speaker started by giving a brief history of these measures and noted that, thus far, only 89 out of 152 current states parties had submitted any. He also discussed one state party's efforts in respect of CBMs, including a handbook, demarches to states parties on submissions of CBMs, technical assistance, bilateral approaches during meetings, and highlighting CBMs during speeches. The speaker urged that, in moving forward, more CBMs should be submitted and in a timely manner. He added that there is a lack of analysis of what has been submitted and noted that translation costs were considerable, but argued for more assistance in preparing CBMs, translation, discussion of the measures at meetings, greater accessibility to them, and greater transparency to improve accountability.

Another speaker discussed a report that had been prepared for the Dutch presidency of the EU indicating what Europe could do for the Sixth Review Conference. It was noted that Europe had several options: the first was to aim high and call for some kind of verification and compliance mechanism but it was cautioned that this could create tension with the United States. The second would be a minimalist approach with a bland final declaration and an agreement to meet again in 2011. The third was a middle approach whereby Europe could, through its soft power and under its WMD strategy, put a non-proliferation clause in trade agreements. It was added that the EU could also create expertise within the EU and encourage informal assistance efforts in respect of implementing the BWC with the objective of something more formal down the road. On the other hand, it was noted that submissions of CBMs were down in Europe, making it hard for it to look serious about the BWC. Accordingly, the speaker argued that it might be useful to take a look at who has called for an OPBW but has not been submitting their CBMs. He added that it would also be useful to start identifying members of the diplomatic corps who will be in posts during the Sixth Review Conference for contact and long-term decision making.

The next speaker briefly mentioned the United Kingdom's suggestion at the Fifth Review Conference for meetings at which scientific and technological developments can be discussed. He noted that his paper reviews these developments over the course of some of the earlier conferences. Related to this, another speaker discussed a report calling for the need to enhance regulations governing genome data, particularly in light of their dual-use potential. He noted that thought should be given to formal methodologies and risk assessments for evaluating the benefits and costs associated with genome data, and added that there should be a review of how this data could be used by terrorists and of its availability on the internet, and of whether it is subject to export controls. With regard to the transparency of genome data, he noted that some information probably must be withheld but that we must be satisfied as to why it has been, who has made the decision, and what has been kept back.

The final speaker at the 2004 workshop on the BWC discussed The BioWeapons Prevention Project (BWPP) – a global civil society activity – and its aims and objectives. It was observed that non-governmental organisation participation in monitoring the BWC is limited, accordingly, BWPP is addressing this shortage of attention by creating a global network to strengthen the norm against misuse of biotechnology. The success of the project in South Africa was briefly discussed, including positive responses from government, industry, scientists, and academia. It was noted that a course had been prepared on the norm against misuse of biotechnology, regulations and ethical decision-making, and that BWPP hopes to make this course available to all life science students. BWPP's efforts to mark the upcoming 30th anniversary of the BWC were also noted.

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Affiliations are listed for identification purposes only, all participants take part in their personal capacity.]

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Third Pugwash Workshop on Threats without Enemies: The Security Aspects of HIV/AIDS

Learning lessons from the first wave of HIV/AIDS

Gordon's Bay, South Africa, 29 April–1 May 2005

Report

by Sandy Rowoldt Shell

Having invited the participants to introduce themselves, Professor Gwyn Prins of Columbia University and the London School of Economics and Political Science (LSE) opened proceedings by giving the background to the workshop and setting the rationale for the agenda.

Background to the workshop

In response to a proposal made by the South African Pugwash Group to convene two exploratory workshops to examine the different dimensions of the HIV/AIDS pandemic as a security issue, the Pugwash Council agreed and these workshops took place during 2004.

The first workshop was held at Betty's Bay in the Western Cape Province, South Africa from 7-9 February 2004. The report and selected materials relating to the workshop are available online.[1]

The second of these workshops was held near Warmbaths in the Limpopo Province, South Africa from 25-28 June 2004. This second workshop probed more deeply into the political, epidemiological, statistical and national policy ramifications of HIV/AIDS as a threat to international peace and security. The report and selected materials relating to this workshop are also available online.[2]

The third exploratory workshop

The particular purpose of this third meeting was to share the experiences and lessons, both good and bad, learned thus far in the management of the pandemic in South and Southern Africa with countries that could be considered to be experiencing the "second wave" in the global spread of the HIV/AIDS pandemic.

In view of the many similarities of the pandemic shared between Southern Africa and India—particularly in terms of clade, aetiology and, to a certain extent, the degree of denial at both leadership and grassroots levels —the Pugwash Group believed there is a specific urgency to engage, in the first instance, with appropriate specialists from the Indian sub-continent.

Beyond India, the Pugwash Group believes that this knowledge must also be made available authoritatively and swiftly to those firmly in the path of the pandemic in Russia, Central Asia and China. The Pugwash Group believes that this workshop offered the first opportunity for an inter-continental exchange of this nature. Given India's vast population of 1,1 billion, coupled with the speed of the spread of the pandemic on the African sub-continent, there is no time to waste. There is a compelling need for the urgent sharing of knowledge, skills and experience. There is as much to be learned from what has not been done or has been done poorly in the Southern African region as from what has been effective.

Four papers were selected for the workshop that would describe the

South and Southern African experience to date, with two invited Indian delegates given the opportunity to respond.

The first paper would present a status report on HI virological research and future prospects for the virus in Southern Africa. Subsequent papers would deal with the arrival and vectoring of the virus in South Africa, the controversies around AIDS statistics and a history of the political management of the AIDS pandemic in South Africa. Responses and comparisons would follow from the Indian delegates on HIV/AIDS and security in India.

Virological challenges

Any comprehensive understanding of the present state of the pandemic in South and Southern Africa needs an appreciation of the changing nature of the virus and the attendant challenges facing virological research nationally and internationally. Accordingly, the first paper looked at preventive strategies and vaccine developments.

The greatest challenge to the development of a successful range of vaccines or any other form of viral control is that viral diversity is becoming a growing characteristic of the HIV pandemic. This diversity is increasing as fast as it can be measured. The presentation of one case study served as a reminder "that HIV remains a frighteningly versatile foe, one that can mutate to escape immune attack or to acquire drug resistance with surprising speed …". Virologists were faced with the reality of the development of a "super strain" of the virus exhibiting multi-drug resistance and extremely rapid development in its clinical course to AIDS.

That HIV is developing into an increasingly complex molecular pandemic was recognized at the International AIDS Conference in Bangkok in 2004 with an acknowledgement that the virus is changing at an even more rapid pace than had been so far understood.

Adding to the seemingly insurmountable challenges of combating the virus on a grand scale, surveillance levels remain poor internationally with only specific pockets of populations being targeted. What is needed is more and better surveillance of populations, especially among the newly infected and over time. Innovative and ethically acceptable methods of testing wider population ranges need to be developed and implemented before the full impact and vectors of the thrust of the pandemic can be assessed.

There is growing recognition that certain genetic strains of the virus are transmitted more easily and more rapidly. Clade C, responsible for approximately 50% of the world's HIV infections, including among the populations of South Africa and India, is the most readily transmitted. This clade of the HI lentevirus exhibits a lower replicative capacity that leads to slower progression of the disease. This, in turn, allows for a longer time for possible exposure and therefore a greater number of opportunities for transmission.

A further challenge to the development of an effective HIV vaccine is the HLA (human leucocyte antigen) diversity of a population, compounded by the existence of dual infections and the growing phenomenon of super-infection.

The massive immunological challenge is complicated by the absence of successful means of animal testing that will replicate the progression of viral infectivity in humans. Ethical issues preclude the use of "live attenuated" HIV vaccines in trials.

Poor immunogenicity results in humans have hindered progress in the development of a successful DNA vaccine and the current hot topic in immunology revolves around toll-like receptors. Despite this hope, virologists must conclude that there is unlikely to be any major successful vaccine in the immediate future. ARVs and prevention presently must remain the most effective strategies to combat HIV.

The arrival and vectoring of the virus in South Africa

The second Pugwash workshop held at Betty's Bay in February 2004 discussed the challenges posited by dissidents contributing to the AIDS debate who have attempted to discredit the quality of datasets used in scientific descriptions and projections of the pandemic. The importance of being able to demonstrate the integrity of the data used in the analysis of the pandemic was dealt with in the next presentation that began with a rigorous interrogation of a specific range of datasets gathered in Region A of the Eastern Cape and used to track the arrival and vectoring of the virus in the region.

The impetus for gathering the data that comprises the primary dataset came in 1988 through the efforts of the then Medical Officer of Health in the Nelson Mandela Metropole who recognized the growing impact of the pandemic and the need to be able to track and measure it over time. Using the offices of the AIDS Training Information and Counseling Centre or ATICC, case-level data recording HIV-positive

patients were submitted by various agencies in Region A including antenatal clinics, medical practices, insurance companies, District Surgeons, Medical Officers of Health, hospitals, army bases, police and prison records and the Eastern Province Blood Transfusion Service. The data, cumulating over time to nearly 30,000 cases by 2000, was analysed in terms of 43 variables and, given its twelve-year span, offers the opportunity of tracking the pandemic from infection to death.

Added to this primary dataset was data from graveyard records and an additional set from undertakers back to 1974, pre-dating the onset of the pandemic.

Ratepayers' lists, telephone directories from 1988-2000 and TB records from SANTA augmented and endorsed the primary dataset building in total a composite set of irrefutable, case-level data.

One of the main reasons why HIV/AIDS has spread so rapidly in Africa is that the continent has been embroiled in twenty years of intermittent military violence in several regions such as Angola, Burundi, the Democratic Republic of Congo, Eritrea, Ethiopia, Liberia, Mozambique, Namibia, Rwanda, Somalia, South Africa, Sudan, Uganda and Zimbabwe. As has been argued in many studies, war creates favourable conditions for the transmission of HIV. South African Defence Force troops and the liberation armies, which were deployed in neighbouring countries during the liberation wars, were subsequently merged into the South African National Defence Force and distributed to army bases across the country. These became an almost perfectly randomly distributed set of sites for the incipient pandemic between 1992 and 1994. Recruits who had been called up to do national service simply returned to their homes without any exit testing or counselling. This process established an additional possible vector for the spread of the virus. This hypothesis is evidenced in the records of the Region A datasets described above.

If South Africa had followed the example of Cuba, which rigorously tested their troops on their return from their engagement in Angola, the HIV pandemic might have been arrested in this country as it was in Cuba. However, there was no testing. Worse, the blood transfusion services continued soliciting blood donations from the military establishment until 1985. There was no HIV screening of the blood supply in, for example, the Eastern Cape, until 1988 (tests only became available in South Africa in 1985). The blood supply of the Eastern Cape was therefore potentially open to HIV contamination for almost a decade after the first incursions into Angola by South African troops in 1976.

Researchers remain largely oblivious, even resistant, to the obvious military epidemiology. There has yet to emerge an alternative and convincing explanation for the pronounced regional variance in the provincial breakdowns. Accordingly, it is argued that the military should be considered seriously as an additional vector in the spread of the pandemic.

The battle over HIV and AIDS statistics

The third presentation followed the interrogation of HIV data with an analysis of the battle over HIV and AIDS statistics, raising the question: "Do the models reflect reality?"

Since the mid-1980s, there has been a range of interest groups who have joined the battle over HIV and AIDS statistics. Conflicting numbers have been posited in the media by different interest groups regarding the number of HIV-positive individuals, the numbers of AIDS deaths per annum and the numbers of AIDS sufferers. These groups range from outright HIV/AIDS dissidents, who denounce the figures as being inflated for financial gain by the pharmaceutical industry, to various AIDS lobby groups who tend to exploit exaggerated figures generated by less than reputable sources to foster support for their causes.

The presenters argued that in setting the ground rules for HIV statistics, it is essential to gain an understanding of what is being measured, of the nature of the HIV test itself and of the construction of the sample being tested.

With regard to testing, the typical protocol would involve an initial plus a confirmatory test of a blood sample. Only if both tests were positive, would the case be recognised as HIV positive. In practice, if properly applied, HIV testing has proved highly accurate.

The issue of sampling is perhaps of even greater importance. Given that it is seldom possible to test an entire population, the most common way to study a large population is by means of sampling. It is essential that samples are properly constructed or conclusions will be drawn for the entire population that, at best, could be misleading.

It is therefore extremely important in the battle of HIV statistics to understand exactly how a sample has been constructed and so be assured that extrapolations from this sample

to the greater population will have any degree of certainty. Any sample will have an element of bias to the extent that it is not truly representative of the entire population being sampled. Primary errors relating to HIV statistics (and therefore the source of "battles") lie in the way in which sample data is extrapolated to large populations.

It was critical to recognize the differences between HIV statistics, which are virtually all based on data sampling, and AIDS statistics that are gleaned from individual patient clinical records. Because AIDS is a syndrome and not a single disease, there is no single test available to classify the presence of AIDS. Instead, it is common for researchers to use the staging system used by the World Health Organisation, which have defined four stages of the disease from acute HIV infection (WHO stage 1), through early disease (WHO stage 2), followed by late disease (WHO stage 3) to AIDS (WHO stage 4). The first two of these stages are largely asymptomatic while Stage 3 sees the onset of opportunistic infections and attendant symptoms such as weight loss and oral infections. In stage 4, HIV-positive individuals experience a range of more severe conditions such as pneumonia, extrapulmonary TB and wasting syndrome. These conditions are collectively referred to as AIDS.

It is clearly important to be able to distinguish diseases that can cause symptoms similar to those exhibited in AIDS. In doing this, one of the critical requirements for an AIDS diagnosis is a measurement of the CD4 cell-count, which measures the strength of the body's immune system. Stigma, poor administration and lack of resources can all contribute to the difficulty in collecting accurate AIDS data.

Concomitant with the difficulties experienced in the collection of AIDS-prevalence data is the underreporting of AIDS deaths. Over the last few years, the topic of AIDS deaths has become a subject of considerable controversy. AIDS dissidents and denialists have compared figures of modelled AIDS deaths to the figures of actual deaths in South Africa and have concluded that some models vastly overstate the actual numbers of AIDS deaths. However, there is a relatively close fit between the number of deaths estimated by the ASSA2002 model compared with the number of registered deaths issued by Statistics SA.

The ASSA2002 AIDS and demographic model directly models five interventions that affect the pandemic: (i) Information and education campaigns; (ii) Improved treatment of sexually transmitted diseases; (iii) Voluntary counselling and testing; (iv) Mother to child transmission prevention; and (v) Antiretroviral treatment. All five of these interventions will have an impact on the pandemic in future, which could in part lead to additional uncertainty around HIV-prevalence rates and AIDS mortality. Four of the interventions will have a reducing impact on the HIV-prevalence rate by reducing new infections. These four are: (i) information and education campaigns; (ii) improved treatment of sexually transmitted diseases; (iii) voluntary counselling and testing; and (iv) mother to child transmission prevention. The remaining intervention, namely antiretroviral treatment, will result in HIV-positive people remaining HIV-positive for a longer period of time and will therefore increase HIV-prevalence rates.

With the introduction of antiretroviral treatment, it has become necessary to consider a fifth and even a sixth disease stage in the modelling process. Without treatment or other intervention, HIV-positive individuals progress through each of the four WHO disease stages, but individuals who experience their first AIDS-defining illness are assumed to move to stage 5 when they will receive ART. Stage 6 represents those individuals who have discontinued ART. A final stage, stage 7, is AIDS death.

Key conclusions from the first part of this presentation included:

- There are sufficient data points and time series of HIV data to extrapolate HIV data to estimates at the population level with a high degree of confidence.
- There IS a large-scale epidemic of HIV infection in South Africa.
- AIDS sickness and mortality statistics are still subject to many sources of uncertainty and error. In addition, the positive impact of treatment will now start to change the profile of AIDS statistics continuously from a modelling and extrapolation point of view.
- More rigorous AIDS treatment programmes will now start to enhance the value of AIDS data significantly.
- There is currently NO clear picture of the real level of AIDS sickness and mortality in South Africa.

The battle over HIV and AIDS statistics has developed in part as a result of the differences between the statistics produced by different AIDS and demographic models. The two principal AIDS and demographic models currently being used to estimate the current and future impact of the HIV/AIDS epidemic on South Africa are Spectrum and EPP, used by UNAIDS and the ASSA2002 model developed by South African actuaries, which is based, in turn, on the Doyle model, the original actuarial model developed by Peter Doyle of Metropolitan.

The factors that have resulted in a battle around HIV and AIDS statistics in South Africa need to be understood to avoid similar debates in countries where the epidemic is still in its initial stages. These factors have included: the differences between estimates from the main AIDS and demographic models for South Africa; the lack of some models to validate their estimated AIDS and total deaths to recorded deaths; the controversy around statistics caused by AIDS dissidents; and a misunderstanding of the statistics and the modelling process.

It is an incontrovertible fact, however, that South Africa has an HIV epidemic of massive proportions, of which the impact will be felt by generations into the future. It is important to acknowledge, however, that the country has developed considerable local skills in quantifying the extent of the epidemic. Efforts to argue about the data should be redirected more constructively towards dealing with and preventing the consequences of this massive pandemic.

A history of the political management of the AIDS epidemic in South Africa 1982-2005

This presentation addressed the issue of how successive polities in South Africa have handled the HIV/AIDS pandemic. Despite some good policy plans, the principal problem with both the former National Party government and the current government has been one of implementation. Failure of leadership to deal effectively with the problem has led to attempts by civil society to bypass the administration by appealing to the courts to enforce the implementation of declared AIDS policies. The rift between sectors of civil society trying to deal effectively with the pandemic and the government grows ever wider. The root of the problem is seen as the failure of South African governments to define the AIDS policy problem consistently and correctly.

Statistics released by the Joint United Nations Programme on HIV and AIDS (UNAIDS 2004) were cited:

- more than 5.3 million South Africans were HIV-positive at the end of 2003;
- AIDS is killing the population at a rate of between 600 and 1,000 people each day;
- the country will have around two million AIDS orphans by 2010; and
- between 1,400 and 2,000 additional South Africans are becoming infected daily.

Without effective treatment for HIV and AIDS—i.e. without the comprehensive and systematic rollout of ARVs—the need to implement an urgent and appropriate public programmatic response is patently clear.

Examining the reasons why successive South African governments have failed in combating the HIV pandemic, an inability to identity the true nature of the problem has been identified as a root cause. The National Party government regarded HIV and AIDS primarily as a moral issue leading to an unwritten policy response steeped in a moralist discourse rather than identifying and responding to the problem in biomedical terms: according to the government, those affected were homosexuals, intravenous drug users, commercial sex workers and black migrant workers, who could be regarded as aberrant members of the population. However, when the virus began to affect those in what the government regarded as 'normal' South African society, the growing epidemic became increasingly identified with the black sector of society, thus serving to racialise and politicise the epidemic. The apartheid government could use AIDS as an excuse to

exclude foreign mine workers, and could throw the blame on liberation movements for infiltrating South African society with AIDS as a new weapon.

When it became obvious that HIV/AIDS was entering white South African society as well, the government gradually reconceptualised AIDS as a biomedical problem, creating medical bodies and legislation to facilitate a biomedical response to the growing epidemic. In a rapidly changing political landscape, with the institution of South Africa's first democratic government and radical constitutional changes looming, government policy shifted to allow greater room for human rights-based perspectives on the epidemic, culminating in the formation of the National AIDS Co-ordinating Committee of South Africa (NACOSA) and the accompanying process of 1992-1994, which led, in turn, to the drafting of the democratic National AIDS Plan (NAP) of 1994.

But the National AIDS Plan proved to be over-ambitious and the new Mandela government reverted to a biomedical conceptualisation of the AIDS policy problem. A series of profound errors were made, including the Virodene debacle (1997) and the mishandling of the Sarafina II scandal (1996), which effectively corrupted the AIDS policy environment.

When President Thabo Mbeki took office in 1999, he exacerbated the situation by questioning the fundamental tenets of medical science. His obdurate declarations denying proven medical and scientific findings on HIV and AIDS forced politics to enter the biomedical domain. Mbeki re-conceptualised the problem largely as a monetary issue, blaming the profit motives of the large pharmaceutical companies for continuing and increasingly disastrous projections of the prevalence of the virus. Mbeki's and his minister of health's stubborn resistance to the empirically proven scientific evidence surrounding the virus and the pandemic, combined with an almost inexplicable heel-dragging regarding the rollout of essential anti-retroviral treatment, has led to nation-wide confusion and delay. The policy problem remains firmly an area of contention and it would seem that the President and the health ministry may become increasingly isolated even within the broader governing alliance—the African National Congress—regarding policy and strategies to combat the epidemic. Increasingly, sub-national bodies (provincial and local levels of government) are working with members of South Africa's civil society in an effort to ensure the roll-out of treatment strategies. HIV and AIDS arguably constitute the most politicised issues in South Africa today.

Regarding the way ahead, there would seem to be three identifiable groups of issues requiring further examination:

- The problem identification phase is an essential and under-valued step in the process of AIDS policymaking and needs closer examination and resolution.
- A chasm has developed between the respective perspectives of the government and AIDS civil society on the most appropriate way forward for AIDS policy design: the government is pushing for the continual drafting of AIDS prevention strategies, and the TAC, in particular, is emphasising the importance of treatment strategies. AIDS prevention and AIDS treatment should not be seen as mutually exclusive but rather complementary.
- Research should be conducted to explore ways in which technical knowledge and discourses can be democratised to avoid the present situation where the state seeks to exclude non-state policy actors from exercising the right to make statements on and define the very problem of AIDS policies themselves.

There are, however, some chinks of light in the darkness of state intransigence including moves by the ministry of finance to bankroll improved ARV rollout, evidence of increased capacity to provide essential services in some of the provinces and local authorities, the successful bypassing of the highest and most intransigent by civil society in the creation of programmes and infrastructures, and several new appointees within the national health department who appear to be committed to accelerating measures to combat the spread of HIV and AIDS.

AIDS in Africa: three scenarios to 2025

Three scenarios were presented that were posited as a result of three workshops involving UNAIDS, UNDP, IBRD, ADB, ECA and Shell International's Global Business Environment (GBE) Team. The three scenarios were based on the question "Over the next 20 years, what factors will drive Africa's and the world's responses to the AIDS epidemic, and what kind of future will there be for the next generation?" In developing these scenarios, consideration had to be given to how the crisis was perceived and by whom, and whether there would be both the incentive and capacity to deal with it.

Scenario One:

Tough Choices: Africa takes a stand
A story in which African leaders choose to take tough measures that reduce the spread of HIV in the long term, even if it means difficulties in the short term. Leaders and communities come together.

Scenario Two:

Traps and Legacies: the whirlpool
A story in which Africa as a whole fails to escape from its more negative legacies, and AIDS deepens the traps of poverty, underdevelopment, and marginalisation in a globalising world.

Scenario Three:

Time of Transition: Africa overcomes
A story of what might happen if all of today's good intentions were translated into the coherent and integrated development response necessary to tackle HIV and AIDS in Africa.

None of the African representatives supported any of the scenarios outlined above.

There was a fourth scenario dubbed "*Mama Africa*", rooted in the African experience, but it was discarded by the northern sectors of the team.

While not perceived as entirely successful, there were key lessons that could be learned from this exercise. As part of the process, a clear need emerged to establish and maintain legitimacy, to be honest about who the client is and about normative agendas, to listen to the participants, to respect them, to cultivate them as future champions, to locate the project in Africa and to be sensitive to North-South issues. Above all, there was a need to beware of cultural and intellectual arrogance.

HIV/AIDS and security: a case study of India

The final contribution to the workshop dealt with India's response to HIV/AIDS. As an emerging power, India is faced with many obstacles along the path to potential great power status. One of the most urgent and serious of these dangers is presented by the fact that there are presently 5.1 million Indians infected by HIV/AIDS translating to close to one per cent of the country's adult population.

India has recognised that, in terms of the progression of the pandemic, it stands today where South Africa stood some fifteen years ago. Similarities abound. The very small number of sentinel sites set up by the National AIDS Control Organisation across the country means that surveillance is woefully inadequate in India. Full-blown AIDS cases, people whose ages fall outside the grouping of 15-49 years and sex workers are not currently included in the surveillance net, nor are those attending private hospitals, which cater for approximately 80% of healthcare in the country. There are also questions regarding the quality of HIV testing standards.

The US National Intelligence Council (USNIC) estimated that, by 2002, there were between 5 and 8 million HIV-infected people in India. The People's Health Organisation in Mumbai claims that infections are doubling every 18 months to two years and that it is possible that there are between 10 and 12 million HIV-positive people across the country today.

High-risk populations who are acknowledged to be contributing to the spread of the pandemic include female sex workers and truckers, but other carriers have also been identified. While strong social stigma makes accurate assessment impossible, there are reportedly high numbers of homosexuals who are testing HIV positive. In addition, blood and blood products pose an additional risk. The World Health Organisation estimated in 1998 that up to one-fifth of all of India's infections were due to improperly screened blood and blood products. Currently, Indian health authorities acknowledge that 8% of HIV infections are transmitted through infected blood.

High population mobility and the uneven sex ratio are further contributory factors increasing the spread of

HIV/AIDS. Poor health facilities, particularly among the rural poor, give further cause for concern.

Three principal factors were identified that would transform HIV/AIDS into a security threat to India: poverty, ignorance about the disease and social stigma leading to widespread denial.

India has in the region of 1.3 million military personnel who are deployed across wide swathes of the country including in the north-eastern regions where many Border Security Force personnel are testing HIV positive. Similarly, police personnel deployed in India's metropolitan cities are considered to be high-risk populations. International peacekeeping forces are regarded as responsible for spreading the virus among the population in their areas of deployment. India, in turn, has a commendable record of sending troops to other countries on UN peacekeeping missions.

Relations with neighbouring countries such as Nepal are becoming strained under accusations that Nepalese migrant workers return home having contracted HIV while employed in India.

While there are no systematic and comprehensive studies to date detailing the economic effects of a rapidly increasing HIV pandemic on India, it is clear that the pandemic will have an adverse impact on the Indian economy and productivity both in the short term and in the long term.

There are particular social and cultural effects that may become evident as the pandemic spreads throughout India. It is possible that HIV/AIDS, with the passage of time, could produce yet another new and unique caste of "untouchables". This could, in turn, provoke violence and civil strife. A growing population of AIDS orphans would imbalance societal structures and security. Alienation from their societies through stigma and social shunning could also lead to growing numbers of people resorting to alternative and even violent ways of securing their livelihood.

Within the current Indian marriage system, where caste, astrology and dowry remain factors for consideration, HIV status is set to become a major issue . There are already moves to draft legislation making HIV testing compulsory before marriage in some states.

It is hoped that the South and Southern African experience in understanding, describing and combating HIV/AIDS (including the errors and inadequacies) may prove useful signposts for those in India who are engaged in the fight against the onslaught of the pandemic.

[1] Pugwash meeting no. 291: http://www.pugwash.org/reports/ees/south-africa-2004/south-africa-2004-workshop-report.htm

[2] Pugwash meeting no. 297: http://www.pugwash.org/reports/ees/south-africa-2004/sa-workshopreport.htm

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Challenges to the Nuclear Non-Proliferation Regime

PUGWASH MEETING NO. 304

WMD in the Middle East

Cairo, Egypt, 29–30 January 2005

Weapons of Mass Destruction Elimination: A Middle Eastern Perspective

a joint meeting of the Weapons of Mass Destruction Commission chaired by Dr. Hans Blix, the Pugwash Conferences, the Egyptian Council on Foreign Affairs, and the Friedrich Ebert Stiftung

On 29–30 January 2005 in Cairo, Pugwash participated with the Blix Commission on WMD in convening a meeting bringing together some 60 experts from the Middle East and internationally for informal discussions of ways and means of promoting a WMD-free zone in the Middle East. Pugwash participants included Secretary General Paolo Cotta-Ramusino, Executive Director Jeffrey Boutwell, and Council members Mohamed Kadry Said, Gen. Pan Zhenqiang (a member of the Blix Commission) and Steven Miller.

Dr. Steven Miller, Dr. Tariq Rauf, Dr. Harald Mueller, and Dr. Dewi Fortuna Anwar

Amb. Abdel Moneim, Dr. Hans Blix, and Amb. Henrik Salander

International Conference on Nuclear Technology and Sustainable Development Tehran, Iran, 5-6 March 2005 *And* Visit to the Esfahan Nuclear Facility of the Atomic Energy Organization of Iran Esfahan, Iran, 7 March 2005

Report
by Jeffrey Boutwell

Under the sponsorship and at the invitation of the Center for Strategic Research (CSR) of the Expediency Council of the Islamic Republic of Iran, an *International Conference on Nuclear Technology and Sustainable Development* was held in Tehran from 5-6 March 2005, with the co-sponsorship of the Ministry of Foreign Affairs, the Atomic Energy Organization of Iran (AEOI), and the Ministry of Science, Research and Technology.

Given the controversy over the scope and ultimate aims of Iran's nuclear program and activities, and the importance for regional and international security of resolving the challenges posed to the nuclear non-proliferation regime by this controversy, the conference could not have occurred at a more critical time.

Some 25 international experts attended the conference, which was presided over by Dr. Mahmood Vaezi of the CSR, and which included the opening keynote address by Dr. Hassan Rohani, Secretary of the Supreme National Security Council of Iran, and closing remarks from Ayatollah Akbar Hashemi Rafsanjani, Chairman of the Islamic Republic of Iran's Expediency Council. Also attending was a diverse group of more than 40 Iranian participants, including members of the government, scientists, academics, researchers, and journalists.

Pugwash participants at the meeting included Prof. Paolo Cotta-Ramusino (Secretary General), Dr. Jeffrey Boutwell (Executive Director), Dr. Steven Miller (co-chair of US Pugwash and member of the Pugwash Council), and Prof. Saideh Lotfian (chair of Iran Pugwash and member of the Pugwash Council).

The conference consisted of four plenary and four break-out sessions each for two working groups (one on *Application of Nuclear Technology in Medicine, Industry and Agriculture,* and the second on *International Peace and Security: Challenges and Threats*), with more than 20 papers given by Iranian and international participants (including all four of the Pugwash participants). The conference was characterized by a very open and candid exchange of views among all participants. Substantive differences of opinion over the nature, rationale and international ramifications of Iran's nuclear program were aired in both the plenary and break-out sessions, with the result being a genuine dialogue. For more information on the conference sessions and presentations, see the CSR conference website, www.ntsd.ir.

The conference was widely covered by the international media, some of whose reports can be accessed through the web links included with this report.

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In addition to the conference sessions, Cotta-Ramusino, Boutwell and Miller were part of a 7-person group that met for almost two hours with Dr. Rohani during the lunch break on March 6 for a wide-ranging discussion of Iran's nuclear plans, the Iran-E3 negotiations (with UK, France, and Germany), US-Iran relations, the prospect of Iran's resumption of uranium enrichment, and the ramifications of IAEA referral of the issue to the UN Security Council. Others in the group included George Perkovich and Joseph Cirincione (Carnegie Endowment for International Peace), Clifford Kupchan (Nixon Center) and Maurizio Martellini (Landau Network – Centro Volta).

Much of the discussion focused on exploring ways that Iran can provide the transparency necessary to ensure the international community that Tehran has no intention of diverting materials from its civilian nuclear energy program for potential military use. Dr. Rohani made it clear that Iran's current suspension of uranium enrichment activities is just that – temporary – and that Iran intends to follow through with a full civilian nuclear power program, including enrichment, as allowed by Article IV of the Non-Proliferation Treaty. For this reason, he was particularly interested in considering what additional measures of safeguards and transparency Iran could undertake to provide confident reassurance to other states about the peaceful

character of Iran's nuclear program. In this meeting there was also much discussion of US-Iran relations. Most strikingly, Dr. Rohani explicitly regretted missed opportunities since the attacks of September 11 to improve Iran's relations with the United States. Participants discussed the possibility of future Pugwash and other NGO meetings in Iran including participation by members of Congress or their staff, to which Dr. Rohani responded that he would certainly consider that possibility.

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On March 7, Cotta-Ramusino, Boutwell, Miller and Lotfian were part of a group of some 15 conference participants who were flown to Esfahan and given a six-hour tour of the Esfahan complex that includes the Esfahan Nuclear Research Center, the Uranium Conversion Facility (UCF), and the Zirconium Production Plant. It is believed that this tour of the Esfahan nuclear facility was the first ever by a group of international experts, apart from inspections carried out by teams from the IAEA.

The group was given a briefing by the director of the Nuclear Research Center, and then toured the two main parts of the facility: (1) the UCF, devoted to converting uranium yellowcake to uranium hexafluoride (UFl_6), whose operations Iran has currently suspended and which is under IAEA safeguards, and (2) the Zirconium Production Plant, which will produce the zirconium claddings which will house the enriched uranium fuel rods destined for Iran's future civilian nuclear power plants when they become operational (the Bushehr 1000 megawatt reactor is scheduled to come on line in late 2006, with initial fuel provided by Russia).

The group had ample opportunity for discussion with scientists and engineers at the Esfahan facility during the visit.

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Finally, the conference in Tehran also provided an opportunity for Prof. Cotta-Ramusino to convene a meeting of the Iranian Pugwash group. On Saturday evening, March 5, Prof. Saideh Lotfian brought together a group of Iranians, most of whom have participated in several previous Pugwash meetings, for a discussion with Cotta-Ramusino, Boutwell, and Miller about strengthening the Pugwash network in Iran and future Pugwash workshops in Iran on issues of Middle East and Persian Gulf security. This group included Mahmood Vaezi (CSR), Ali Asghar Soltanieh (Foreign Ministry), M.K. Sajjadpour (Ministry of Foreign Affairs), Kayhan Barzegar (Islamic Azad University), and Nasser Saghafi Ameri (CSR). Dr. Mustafa Zahrani (director of Institute of Political and International Studies) was not able to attend due to other commitments. At the end of the informal discussion, Cotta-Ramusino expressed his gratitude for the deep interest and enthusiasm shown by Prof. Lotfian and her colleagues for the wide range of Pugwash international activities.

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The three days spent in Iran provided Cotta-Ramusino, Boutwell, Miller and the other international participants with a unique opportunity to: (1) hear first-hand the economic, development, and energy rationales underlying Iran's nuclear program from a wide variety of Iranian policymakers and scientists, and (2) convey to the highest Iranian authorities their concerns with the integrity of the NPT and the fate of the international non-proliferation regime. The international conference, the meeting with Dr. Rohani, and the trip to the Esfahan nuclear facility also provided numerous opportunities for exploring ways of strengthening transparency and confidence, through cooperative and multilateral measures, so that Iran's nuclear program can achieve its stated goal of providing energy and economic development while also fulfilling Iran's NPT and IAEA obligations.

The Pugwash participants and all international participants expressed their gratitude and appreciation to CSR and their Iranian hosts for convening this extremely important meeting and providing for the site visit to the Esfahan facility. Both were noteworthy for the atmosphere of open, frank and honest exchange of views that took place during this critically important juncture in global affairs.

Pugwash Consultations on the 7th NPT Review Conference

New York, New York, 7 May and 21 May 2005

Remember Your Humanity

A Message from Professor Sir Joseph Rotblat
Nobel Peace Laureate, with Pugwash, 1995

An Appeal to Delegates to the Seventh Review Conference of the Nuclear Non-Proliferation Treaty
United Nations Headquarters, 2-27 May 2005, New York, New York, USA

I am in my 97th year, and have been working for the abolition of nuclear weapons, and ultimately of war itself, for most of my working life. This year is also the year when we are celebrating the breakthrough achievements in physics of Albert Einstein, who was not only a great scientist, but a great man of peace, and alongside whom, with others, in 1955, I signed the Russell-Einstein Manifesto, of which, I am the last surviving signatory. In the Manifesto we posed a question:

> ***Here then is the problem which we present to you, stark and dreadful, and inescapable: shall we put an end to the human race: or shall mankind renounce war?***

In 1955 we were at the height of the Cold War, with the two super powers of the time, the USA and the USSR accumulating obscenely huge nuclear arsenals of thermonuclear weapons. Many of the warheads were kept on hair trigger alert – as they are today – increasing the possibility of accidental war. On several occasions, in particular, during the 1962 Cuban missile crisis, we came within a hair's breadth of a nuclear confrontation. With the development of nuclear weapons, Man has acquired for the first time in history, the technical means to destroy the whole of civilization in a single act.

Morality is at the core of the nuclear issue: are we going to base our world on a culture of peace or on a culture of violence? Nuclear weapons are fundamentally immoral: their action is indiscriminate, affecting civilians as well as military, innocents and aggressors alike, killing people alive now and generations as yet unborn. And the consequence of their use might be to bring the human race to an end. All this makes nuclear weapons an unacceptable instrument for maintaining peace in the world. But this has been exactly our policy during, and after, the Cold War. Nuclear weapons have been kept as a deterrent, to prevent war by the threat of retaliation.

For the deterrent to be effective, the threat of retaliation must be real; we must convince the would-be aggressors that nuclear weapons *would* be used against them, otherwise the bluff would soon be called. George W. Bush, Vladimir Putin, or Tony Blair, must show convincingly that they have the kind of personality that would enable them to push the button and unleash an instrument of wholesale destruction. I find it terrifying to think that among the necessary qualifications for leadership is the readiness to commit an act of genocide, because this is what it amounts to in the final analysis. Furthermore, by acquiescing in this policy, not only the leaders but each of us figuratively keeps our finger on the button; each of us is taking part in a gamble, in which the survival of human civilization is at stake. We rest the security of the world on a balance of terror. In the long run this is bound to erode the ethical basis of civilization.

I am particularly concerned about the effect on the young generation. We all crave a world of peace, a world of equity. We all want to nurture in the young generation the much-heralded "culture of peace". But how can we talk about a culture of peace if that peace is predicated on the existence of weapons of mass destruction? How can we persuade the young generation to cast aside the culture of violence, when they know that it is on the threat of extreme violence that we rely for security?

It makes a mockery of the claim by George W. Bush that his anti-terrorist campaign is based on moral principles. What sort of morality is it that justifies military

action against some states, because of their alleged possession of nuclear weapons, while at the same time insisting on keeping these weapons for oneself, to be used like any other military implement, even in pre-emptive strikes?

I do not believe that the people of the world would accept a policy that is inherently immoral and likely to end in catastrophe. This year is the 60th anniversary of the destruction, in 1945, of the two Japanese cities of Hiroshima and Nagasaki, which provoked a reaction of revulsion, shared by the great majority of people in the world, including the United States. From the beginning, nuclear weapons were viewed with abhorrence; their use evoked an almost universal opposition to *any* further use of nuclear weapons.

On the international arena this feeling was expressed when the General Assembly met for the first time in January 1946, when the first resolution adopted unanimously was to seek the elimination of atomic weapons and all other weapons of mass destruction. A later most important outcome of our realization of the danger of a nuclear catastrophe was the Nuclear Non-Proliferation Treaty (NPT), which came into force in 1970. It has, by now, an almost universal acceptance, with 188 signatories, 98% of the UN membership. The NPT contains two major commitments by its signatories: a) the non-nuclear weapon states undertook not to manufacture, or otherwise acquire, nuclear weapons; b), the five nuclear weapon states—USA, USSR, UK, China and France, that had carried out nuclear tests by 1968—undertook, in Article VI, to proceed in good faith, to nuclear disarmament.

What have we seen since they agreed to this? Most recently, the States parties to the Non-Proliferation Treaty went to their third preparatory meeting for the 2005 Review Conference of the Non-Proliferation Treaty. But this meeting became paralyzed and broke down because of the intransigent position taken by the United States. While abetted by the other Nuclear Weapons states, it was the USA that led the attack on regional states, claiming that the NPT priorities should be directed to stopping the proliferation of nuclear weapons, and that the problem of their own compliance with Article VI was non-existent. The leading non-nuclear weapons states claimed the exact opposite: the proliferation of nuclear weapons could not be stopped while the Nuclear Weapons States arrogated to themselves the possession of nuclear weapons and refused to enter into comprehensive negotiations towards elimination as directed by the International Court of Justice.

The present crisis is the worst in the 35-year history of the NPT. In 1995, at the Indefinite Extension Conference, promises were made to implement the NPT. The major states have broken those promises. In 2000, an "unequivocal undertaking" toward elimination through a Programme of 13 Practical Steps was given. Now, the US is rejecting the commitments of 2000 and premising its aggressive diplomacy on the assertion that the problem of the NPT lies not in the Nuclear States' actions but in the lack of compliance by regional states.

Let us be clear: the Pugwash Movement and the whole international community, nuclear and non-nuclear alike, are concerned about proliferation. Rigorous steps to control and cut off the supplies of nuclear materials must be taken. But to gloss over the hypocrisy of the Nuclear Weapons States, which are modernizing nuclear weapons and ensconcing them in their ongoing military doctrines, while urging abstinence on everyone else, is stunning. This duplicity has caused the patience of many other states to snap. They see a two-class world of nuclear haves and have-nots becoming a permanent feature of the global landscape. In such chaos, the NPT is eroding and the prospect of multiple nuclear weapons states, a fear that caused nations to agree on the NPT in the first place, is looming once more.

At this Seventh Review of the Non-Proliferation Treaty, it is vital for governments and people alike to recognize that the current crisis of international insecurity will not be resolved by anything other than a working system of collective security, as clearly envisaged in the United Nations Charter, and as set out in the provisions of the NPT. Science and technology have made the global community interdependent – whether it is in matters of communication, trade, global warming, or security. We all have a common interest: survival. We have to move forward from a now outdated security system based on nuclear deterrence and alliances, to one based on cooperation and allegiance to humankind. In the words of the Russell-Einstein Manifesto:

> ***There lies before us, if we choose, continual progress in happiness, knowledge and wisdom. Shall we, instead, choose death, because we cannot forget our quarrels? We appeal, as human beings, to human beings: Remember your humanity, and forget the rest. If you can do so, the way lies open to a new Paradise; if you cannot, there lies before you the risk of universal death.***

Above all: Remember your humanity.

Pugwash Consultations on the 2005 NPT Review Conference

New School University, New York, NY, 7 May and 21 May 2005

On Saturday, May 7 and Saturday, May 21, during the Seventh Review Conference of the Nuclear Non-Proliferation Treaty held at the United Nations, Pugwash convened two informal consultations to discuss progress, or lack thereof, made during the Review Conference and whether positive outcomes for the non-proliferation regime might still be achievable. Pugwash is grateful to Prof. Alan McGowan of New School University for helping to provide a conference room for the discussions. Pugwash also thanks the participants listed at the end of this section, who attended one or both of the meetings, for their time and effort in the search for ways of strengthening the NPT and non-proliferation efforts.

Following the disappointing conclusion of the NPT Review Conference, the Pugwash Council issued the statement below.

Statement of the Pugwash Council

A critical moment for the Non Proliferation regime 19 June 2005

The Council of the Pugwash Conferences on Science and World Affairs is greatly concerned about the recent failure of the Seventh Review Conference of the Non-Proliferation Treaty (NPT), held in New York in May, to deliver a final document with concrete indications on how to progress towards the reduction and ultimately the elimination of nuclear weapons, as called for when the NPT entered into force in 1970.

The difficulties and even the possibility of a collapse of the nuclear non-proliferation regime, the weakening of the taboos in place since 1945 on the use of nuclear weapons, coupled with the dangers of a terrorist group detonating a nuclear explosive device, combine to produce a recipe for potential unmitigated disaster.

Despite the urgency of the threat and the gravity of the situation, the lack of political will of some NPT states parties to live up to their obligations under the Treaty produced a deadlock and paralysis during the meetings in New York. Despite the best efforts of the NPT Review Conference President, Amb. Sergio Duarte, and many others, the Seventh Review Conference actually represented a step back from the conclusions made at the two previous review conferences in 1995 and 2000. In particular the important conclusions of the 2000 review Conferences (the so called 13 steps), which have never been implemented, have not been even mentioned in any official document of the 2005 review Conference.

For their part, the original nuclear weapons states (US, Russia, UK, France and China) have not lived up to their obligations under Article VI of the NPT to move decisively toward the irreversible elimination of their nuclear arse-

Sverre Lodgaard.

Sergio Duarte, Jeffrey Boutwell and Tariq Rauf.

nals. Such inaction invites charges of hypocrisy when these same countries seek to deny access to nuclear technologies to non-nuclear weapons states, or – in the case of the United States – continue to profess interest in developing new nuclear weapons and possibly resume nuclear testing.

More broadly, the entire framework of nuclear weapons disarmament is in danger of being swept away. Strategic arms control between the US and Russia is not progressing, the Comprehensive Test Ban Treaty (CTBT) has not entered into force, and serious negotiations have not even started on a Fissile Material Cut-off Treaty (FMCT) to eliminate production of weapons-grade Highly Enriched Uranium (HEU) and plutonium. Moreover, too little is being done to control and dispose of existing stockpiles of HEU that run the risk of falling into the hands of terrorist groups. No attention is being paid to large numbers of tactical nuclear weapons that continue to exist in great numbers with no military rationale whatsoever, while the deployment of weapons in space moves closer to reality.

Elsewhere, fundamental challenges to the nuclear non-proliferation regime are posed by the withdrawal of North Korea from the NPT and its nuclear military program, by the loopholes that exist which allow countries which develop full-cycle civilian nuclear activities to move more easily towards developing nuclear weapon programs, and by the continued presence and activities of three nuclear weapons-states that exist outside the NPT.

Time is running out if a nuclear catastrophe is to be averted. Political solutions are urgently needed to resolve those conflicts that either spawn international terrorism, or increase the risk of the use of nuclear weapons or other WMDs, or destabilize the Non-proliferation regime or all of these things combined. Global security must be based on international institutions and the rule of law rather than on unilateral action and an excessive reliance on military force.

In the wake of the failure of the 2005 NPT Review Conference, the Pugwash Council calls on national governments, multilateral institutions, and international NGOs to lead the international community away from a misplaced reliance on nuclear weapons, We need to understand the catastrophic dangers that await us if clear progress is not made to decisively reduce and eventually eliminate nuclear weapons.

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Dr. Götz **Neuneck**, Member, Pugwash Council; Senior Fellow, Institut für Friedensforschung und Sicherheitspolitik an der Universität Hamburg (IFSH), Hamburg, Germany

Lt.-Gen. (ret.) Talat **Masood**, Independent Columnist, Commentator and Analyst,Islamabad, Pakistan

Mr. Enrique **Ochoa**, Second Secretary, Permanent Mission of Mexico to the UN, Geneva, Switzerland

Ms. Ann **Pollack,** Permanent Mission of Canada to the UN, New York, NY

Mr. Tariq **Rauf** (Canada), Head, Verification and Security Policy Coordination Section, Office of External Relations and Policy Coordination, International Atomic Energy Agency (IAEA), Vienna, Austria

Hon. Douglas **Roche**, former member, Senate of Canada, Edmonton, Alberta, Canada

Dr. Juergen **Scheffran**, IANUS Institut für Kernphysik, Darmstadt, Germany

Amb. Mohamed **Shaker**, Vice Chairman, Egyptian Council for Foreign Affairs (ECFA), Cairo, Egypt

Dr. Waheguru Pal S. **Sidhu**, Professor of International Relations, International Peace Academy, New York, NY, USA

Prof. John **Simpson**, University of Southampton, United Kingdom

Dr. Olga **Sukovic**, Freelance Consultant on Security and Disarmament matters [formerly: Consultant, UN Department for Disarmament Affairs, New York; Scientific Adviser, Institute of International Politics and Economics, Belgrade, Yugoslavia

Prof. Siddiq **Wahid**, Maharaja Gulab Singh Chair, University of Jammu, Jammu, J&K State, India

Mr. Alyn **Ware**, Coordinator, Parliamentary Network for Nuclear Disarmament, New Zealand

Jim **Walsh**, Executive Director, Managing the Atom Project, Belfer Center for Science and International Affairs, JFK School of Government, Harvard University, Cambridge, MA,

Dr. Gunnar **Westberg**, Co-president of IPPNW, International Physicians for the Prevention of Nuclear War, Stockholm, Sweden

Dr Nick **Wilson**, NGO Advisor to NZ Delegation to NPT RevCon, Chair of IPPNW (New Zealand Branch)

Mr. Detlev **Wolter**, Counsellor, Permanent Mission of Germany to the UN, New York, NY

Mr. Jerzy **Zaleski**, Secretary General, NPT Review Conference, Warsaw, Poland

The 50-Year Shadow

by Joseph Rotblat, London

Published: *New York Times,* May 17, 2005
Also published in the *International Herald Tribune*

Fifty years ago, I joined Albert Einstein, Bertrand Russell and eight others in signing a manifesto warning of the dire consequences of nuclear war. This statement, the Russell-Einstein Manifesto, was Einstein's final public act. He died shortly after signing it. Now, in my 97th year, I am the only remaining signatory. Because of this, I feel it is my duty to carry Einstein's message forward, into this 60th year since the destruction of Hiroshima and Nagasaki, which evoked almost universal opposition to any further use of nuclear weapons.

I was the only scientist to resign on moral grounds from the United States nuclear weapons program known as the Manhattan Project. On Aug. 6, 1945, I switched on my radio and heard that we had dropped the bomb on Hiroshima. I knew that a new era had dawned in which nuclear weapons would be used, and I grew worried about the future of mankind.

Several years later, I met Bertrand Russell on the set of the BBC Television program "Panorama," where we discussed the new hydrogen bomb. I had become an authority on the biological effects of radiation after examining the fallout from the American hydrogen bomb test in Bikini Atoll in 1954. Russell, who was increasingly agitated about the developments, started to come to me for information. Russell decided to persuade a number of eminent scientists from around the world to join him in issuing a statement outlining the dangers of thermonuclear war and calling on the scientific community to convene a conference on averting that danger.

The most eminent scientist alive at that time was Albert Einstein, who responded immediately and enthusiastically to Russell's entreaty. And so the man who symbolized the height of human intellect adopted what became his last message—this manifesto, which implored governments and the public not to allow our civilization to be destroyed by human folly. The manifesto also highlighted the perils of scientific progress in a world rent by the titanic struggle over communism. I was the youngest of the 11 signatories, but Russell asked me to lead the press conference in London to present the manifesto to the public.

The year was 1955, and cold war fears and hostilities were at their height. We took action then because we felt that the world situation was entering a dangerous phase, in which extraordinary efforts were required to prevent a catastrophe.

Now, two generations later, as the representatives of nearly 190 nations meet in New York to discuss how to advance the Nuclear Nonproliferation Treaty, we face the same perils and new ones as well. Today we confront the possibilities of nuclear terrorism and of the development of yet more new nuclear warheads in the United States. The two former superpowers still hold enormous nuclear arsenals. North Korea and Iran are advancing their capability to build nuclear weapons. Other nations are increasingly likely to acquire nuclear arsenals on the excuse that they are needed for their security. The result could be a new nuclear arms race.

Fifty years ago we wrote: "We have to learn to think in a new way. We have to learn to ask ourselves, not what steps can be taken to give military victory to whatever group we prefer, for there no longer are such steps; the question we have to ask ourselves is: what steps can be taken to prevent a military contest of which the issue must be disastrous to all parties?" That question is as relevant today as it was in 1955. So is the manifesto's admonition: "Remember your humanity, and forget the rest."

Joseph Rotblat, a physicist and emeritus president of the Pugwash Conferences on Science and World Affairs, was awarded the Nobel Peace Prize in 1995.

ARGENTINA

PUGWASH MEETING NO. 299

Second Regional Pugwash Workshop on *Towards a Solution of Economic Inequities in Latin America and of their Social Consequences*

San Carlos de Bariloche, Argentina, 10–12 September 2004

Report

by Darío D'Atri, Jorge Gil and Walter Scheuer

The Second Regional Workshop was held in San Carlos de Bariloche, Argentina, from September 10 to 12, 2004 within the frame of the Pugwash Study Group *'Towards the Solution of Economic Inequities and their Social Consequences in Latin America'*, thus continuing with the work begun at the First Workshop held in late May 2003. Like the previous workshop, this one was organized by *'Bariloche Group for Science and World Affairs' (BACyAM Group)* and made possible by the generous support of *'Pugwash Conferences on Science and World Affairs'*, *Pugwash Netherlands*, *OSDE Foundation, Buenos Aires* and the following Bariloche-based entities: *Hayland Travel, Puelo S.R.L., MYD Neumáticos* and *Biblioteca Popular Sarmiento*. Two participants from Brazil and one from The Netherlands, all three with extensive experience in Latin America social issues, met with Argentine participants specializing in various socio-economic and scientific-technological fields.

The workshop was held *in memoriam* of Luis Masperi, founder of the BACyAM Group, who passed away on December 2, 2003. Internationally recognized for his brilliant career, Luis also developed a deep and active commitment to human rights causes, total nuclear disarmament, and the pursuit of world peace. A BACyAM Group member spoke the following words to commemorate him:

Luis ("Luigi") Masperi was born in Italy, and took his Ph.D. degree in physics at the Balseiro Institute in 1969. At this Institute he also was a professor and later Director; as well as Chairman of the Argentine Physical Society from 1982 to ´84. He made important contributions to his specific field of research – theoretical high energy physics – and directed the work of many students; he also had an active participation in the concretion of the Auger Project, an international observatory of extremely high energy cosmic showers, whose Southern Hemisphere Section is at present under construction in the Province of Mendoza, Argentina. During his last years he was Director of the Latin American Centre for Physics (CLAF) where his term of office was about to expire.

While internationally known as a research physicist, he was for many years an active member of international movements which endeavour to reach world peace and especially the dialogue between scientists of different nations as a contribution towards resolving international conflict. Among those movements, let us only mention the Pugwash Conferences on Science and World Affairs and the International Network of Engineers and Scientists for Global Responsibility (INES) of both of whose conducting bodies he also participated.

During the 1980´s he was an active participant in actions which led to the creation of ABACC, the bilateral Brazilian-Argentine body which set an end to the nuclear competition between these nations, an action for which he

received the Forum Award from the American Physical Society, jointly with Fernando de Souza Barros, Alberto Ridner and Luiz Pinguelli Rosa. He was also one of the organizers of APDH, the Permanent Assembly for Human Rights in Bariloche, as well as a member (for the center-left Intransigent Party) of the legislative body which wrote the municipal chart of this city.

Besides all his virtues as a scientist, researcher and organizer, Luis was a man of deeply felt convictions about the potential for the moral progress of human beings, among which he firmly believed that to put the results of scientific research at the service of warfare and the interests of political and economical groups was deeply immoral.

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This report contains seven sections summarizing the issues addressed during the workshop. The text is the sole responsibility of the authors. Further information on the Pugwash Conferences on Science and World Affairs, the Study Group, The First Regional Workshop, the BACyAM Group, texts of the papers discussed during the workshop and papers submitted by other people who had been invited but were unable to attend due to previous engagements or last-minute difficulties, are available at www.bacyam.com.ar.

Introduction.

The Second Regional Workshop *"Towards the Solution of Economic Inequities and their Social Consequences in Latin America"* focused on seven key issues:

- Analyzing how the panorama of social and economic inequity has evolved in Latin America, over a year during which there were processes of economic and institutional recovery in several countries (Argentina, Brazil, Venezuela), but also a hard struggle among political-economic paradigms after the crises ensuing the experiences of the 90s.
- Discussing the recent evolution of the problems created by the large foreign debts which are restricting the economy in the main countries in the region.
- Assessing possible Latin American policies for the integration of their scientific-technological fields, as a tool to revert the present predominance of primary economic activities.
- Analyzing investment processes in Latin America, as a tool for growth and development.
- Discussing the relationship between human development, social inequality and political culture in Latin America.
- Identifying new laws to be proposed to Latin American countries in order to improve the quality of both State and private entities and reduce corruption.
- Identifying ways to foster the development of transparent, informed grassroots organizations as well as communication channels between citizens and the Executive and Legislative Powers.

In contrast to the First Workshop on Social Inequity, which focused solely on the diagnosis of the socio-economic and institutional situation in Latin American countries, the debates at this Second Regional Workshop focused on the search for concrete proposals for both economic scenarios and institutional areas. During the First Workshop, the debates were strongly influenced by the shock wave created by the crisis in Argentina, which began in late 2001, exponentially increasing the rates of poverty, underprivilege, mistrust of institutions and political instability. At this Second Workshop, the debates addressed Latin America as a whole, compared Latin America to other parts of the world, and included totally new issues such as the connection between political culture, historical conditioning factors and the struggle against social inequity.

1. Evolution of the panorama of social and economic inequity in Latin America as from early 2003.

At this first session, participants reviewed recent historical antecedents, which were said to be key in causing and sustaining inequitable conditions. In fact, the maintenance of the so-called *Washington Consensus* policies (which involve reducing the role of the State and implementing economic aperture and liberalization of market activity) was singled out as one of the main factors causing inequity.

Some of the major changes following the economic and social crises that have affected Latin America in recent years were identified as follows:

- Following Mexico's 1994 "Tequila" crisis, there were financial cracks in different emerging countries in the region, as a result of the sudden halt in massive financial capital flows towards them. These countries had been using these foreign funds to finance increasing public expenditure and feed the growth of their economies, and the sudden stop caused not only financial crises, but also a domino effect on countries in similar circumstances.

- Neo-conservative style policies suffered a sudden loss of social legitimacy and consensus, due to the rapid, sustained increase in the indices of poverty, underprivilege and inequity in the sharing of national income, as well as decline in the quality of education and health services and, above all, the widespread loss of jobs.
- International context defined by the bursting of the 90s financial bubble, which increased the economic cost to be paid by emerging countries.
- Civil unrest and riots in several Latin American countries, while their governments were putting a lot of effort into changing the ideological orientation of their social-economic policies.
- Upholding of the core of the *Consensus* policies, though toned down by mistrust of the essential *Consensus* paradigm, which is the need to reduce – or directly limit as much as possible – the role of the State.

Within this context, it was agreed that the main Latin American governments clearly seem to have taken the political decision to increase public expenditure, which would be directed firstly at assuaging the consequences of poverty and inequity in income, and secondly, at recovering the State's directive role in the frame of highly de-regulated market economies.

It was also agreed that one of the gravest, though not immediate, consequences of the implementation of the so-called *Washington Consensus* policies has been the exponential rise in levels of insecurity, which can be classified as:

- Insecurity due to crime.
- Labor insecurity.
- Social insecurity of millions of needy people.
- Insecurity regarding property rights.

It was also maintained that the central countries have promoted asymmetrical demands regarding compliance with the *Washington Consensus* policies, making them more lenient for themselves in contrast to the demanding level of compliance required from developing countries, e.g. concerning required fiscal surplus or deficit levels.

Nevertheless, objections were voiced against the former, overly structuralistic view of the causes of inequity. One participant said that the phenomenon of inequality is too complex to be analyzed by means of a political agenda alone, because it would risk limiting the understanding of the problem of social inequality to a cause-and-effect relationship, i.e., bad government policies generate inequality.

Equally, from this standpoint, the participant said that the most needy sectors discuss their rights outside the traditional juridical, political and economic scope, with regard to the meaning of their own rights to work, social inclusion, education, etc. The participant summed up this point of view by proposing to discuss whether a certain juridical or political order would be certain to guarantee the achievement of equality targets.

Clearly different explanations of the origin of inequality and inequity were put forward for different countries. In Argentina, social inequality is closely linked to the his-

torical sequence determined by systematic processes of social exclusion. In contrast, in Brazil and Bolivia, the processes of inequality have occurred within the framework of certain historical sequences determined by processes of limited social inclusion.

Another participant proposed to consider these matters as key to understanding that it is impossible to establish a direct relationship between economic growth and the reduction of inequality, given the historical factors that "genetically" impinge on inequality in each country in Latin America.

Finally, it was suggested that there is a need to propose that both government and non-government organizations should implement active policies in order to foster social inclusion, which is a major problem in Latin America, and to revert the recent exclusion processes.

2. Recent evolution of issues related to foreign debt.

Due to the fact that Latin American countries are so heavily indebted, with some of them even having defaulted on their foreign debts (like Argentina, Ecuador or Uruguay), it was suggested that the region is at a crossroads for defining long-term courses of action. Within this framework, it was said, policies addressing foreign debt are crucial to Latin American countries because debt is a major conditioning factor.

It was also recalled that despite some signs of self-criticism regarding events that occurred during the 90s, international credit organizations and the G-7 countries maintain a general stance of fiscal inflexibility towards emerging countries. They uphold a double standard, requiring developing countries to implement policies which are the opposite of those implemented in central countries. It was added that the same kind of asymmetry occurs regarding debt renegotiation, with international finance organizations pressing for better repayment terms, while they ignore the sustainability of the programs implemented to overcome the defaults.

The following proposals were made to address the issue of foreign debt:

- Defining negotiation formulas with more adequate economic policies, which would not condition growth in the medium or long term.
- Creating cooperation among countries to enable them to improve their position in negotiations, e.g. through MERCOSUR.
- Endeavoring to get out of the ideological traps into which the discussion of growth models has fallen, in order to establish more solid bases for sustained development.
- Proposing that the United Nations create institutional mechanisms to supervise both private and public lenders, as well as credit takers.

In addition, it was suggested that a deep analysis should be recommended regarding the conditions under which Latin American debts were contracted, as well whether or not they are legitimate, in order to define how and to whom payment should be made. It was also proposed that the International Court of The Hague should be consulted as to whether it is legal for the IMF to attribute itself faculties to interfere with the policies and economics of developing countries: Latin American countries should demand that IMF action be in keeping with its own statutes.

One participant said that it is impossible to solve the debt problem based on juridical arguments, because it is a political problem which needs to be resolved politically. To this end, the participant proposed the creation of a multinational Latin American organization to study foreign debts and coordinate policies.

At the same time, the authorities of most of the countries in the region were criticized for excluding – or accepting the exclusion of – Congress (Senators and/or Representatives) from the discussion of the foreign debt. According to the Constitutions of most of these countries, the Legislative Power is in charge of dealing with foreign debt.

3. The present predominance of primary activities in Latin American economies and its relationship with scientific-technological integration and cooperation in the region.

At this session, different situations in Latin American countries were described, to show how strongly they are conditioned by technological dependence, lack of adequate legislation, and the fact that both governments and companies underestimate the role of local and regional developments in science and technology. A summary of the points and proposals made, follows:

- In the particular case of Argentina, even during the years when local industry was booming, little interest has ever been shown in taking advantage of local scientific and technological capacity. Furthermore, despite some cases of cooperation and transfer among countries in the region, there has never been massive technology transfer within Latin America.

- As from the 70s, there has been a steady return to primary economic activity. At the same time, education at all levels has undergone serious deterioration.
- In Latin America it is essential to:
  - determine what policies each country will follow in order to start up processes of industrialization or re-industrialization, based on the contributions of national science and technology.
  - promote the intelligent use of Government purchasing power, in order to foster the relationship between industry and local science and technology and promote local development of internationally competitive technology in fields where there is high added value.
  - give preference to regional industrial production over imported goods when quality and prices are equal, but avoiding the kind of overprotection of non-competitive industry that took place in previous decades.
  - encourage greater Latin American integration in the field of science and technology, particularly regarding its connections with industrial activity. In particular, exploit the potential for closer integration and cooperation between Brazil and Argentina in the area of highly specialized technology, such as space technology and nuclear technology.
  - develop each country's biotechnological capacity in order to achieve a relative reduction of their dependence on central countries.
  - explore the possibility of developing technology to produce systems for controlling corruption.
- Due to its own way of handling things, the Free Trade Area of the Americas (FTAA) would prevent several of the above proposals, e.g. the intelligent use of Government purchasing power aimed at overcoming a country's economy being limited to primary production, which, in addition to perpetuating unfavorable exchange terms, cannot create the number of jobs needed to overcome the crisis in underprivilege and unemployment.

4. Analysis of investment processes in Latin America as a factor affecting growth and development.

The overall situation of investment in Latin America was analyzed, both because investment has slowed down as a result of changes in the international context, and because investments do not necessarily increase job availability.

One of the key factors in reducing unemployment is that wealth should have a high growth rate. In view of this, the obstacles to investment were analyzed as factors directly affecting the processes of social inclusion and re-inclusion based on finding employment for the jobless.

Argentina was mentioned as an example. After its spectacular 2003 – 04 recovery, its installed production capacity is being used very intensively, which, in turn, requires the encouragement of the investment processes in order to guarantee sustained growth. In 2002 there had been record low investment in Argentina, with only 11% of GDP. During the second semester 2003, investment level was similar to what it had been during the 80s, with the consequent risk of repeating the kind of stagnation that occurred in those days. It was stated that in Argentina today, investment is 960 pesos per inhabitant, in contrast to the 60s, when it was 1023 pesos, with peaks of 1600 pesos per inhabitant. Of the present 960 pesos, only 100 are government investment.

Secondly, it was pointed out that a problem Argentina shares with most other Latin American countries, is the fact that people are not trained to acquire knowledge, which affects the possibility of future growth. For example, in Buenos Aires Province alone, between 2001 and 2002, enrollment at schools fell by 16%. Chile is confronting this problem by paying unemployment subsidies only to people whose children attend school morning and afternoon.

One participant proposed to use tax policy and public expenditure policy as tools to solve the problem of inequity.

It was also proposed to encourage State's themselves to plan better resource allocation.

In addition, it was said that international credit organizations should be encouraged to change the way they account for government investment in education and infrastructure, which should no longer be considered as government expenditure subject to fiscal adjustment, but as investment. Nevertheless, one participant maintained that in terms of social research, there is no consensus on whether education is actually increasing social mobility, thus reducing social inequality, or whether, on the contrary, it is reproducing or at least maintaining social inequality.

5. Human development, social inequality and political culture in Latin America.

The main point discussed at this session of the Second Workshop was that until a few years ago, it was believed that growth was related to development. However, the struggle against poverty in Latin America today calls for

immediate solutions, which means that the situation should be tackled from a different political standpoint.

Thus, it was recalled that during the period when importation was undergoing regional substitution, the rise in GDP was associated with industrialization, which, in turn, led to a reduction in poverty and social inequality. However, it was added, poverty and exclusion are currently rising due to changes in the rules of capital accumulation, which have brought about changes in economic growth and the balance of power relations within society. There is more inequality in Brazil, for example, than in other much poorer countries; only Botswana rivals Brazil in terms of inequality.

Some participants pointed out that in spite of this situation, sharing concentrated social benefits more fairly is not a top priority for Latin American politicians nor does public opinion believe it to be essential. Both politicians and the public believe that an increase in available resources would be more effective. Focusing on the problem of inequality and inequity from a purely economic standpoint was therefore criticized. It was said to limit the appreciation of the complexity of the problem, inevitably leading to the belief that it can be solved by means of economic growth alone, without considering the cultural and historical background.

Towards the end of the session, the following points were proposed for an agenda to discuss and analyze the issue of social inequity and inequality:

- Social development and social inequality are not systemic, generalizable variables; their proper study requires to relate them historically.
- It is necessary and better to apply several models for development and several models against inequality than to use a single approach.
- The struggle against inequality is not limited to a mere exercise in economic policy, it is an intellectual and political challenge.
- Rhetoric should be left aside, and an analysis carried out regarding what kind of public policies produce the best results in the fight against inequality. For example, issuing magnetic cards to persons receiving social assistance would eliminate the political cost associated to political clientelism.
- Policies to reinforce civil society are needed.

One of the participants wondered whether inequality can in fact be reduced, even when there is political decision to do, given the context of job destruction. Nevertheless, it was considered that the growth phase that regional economies have been undergoing since 2003 offers an opportunity for Latin American countries as long as the model for economic growth and development is being reconsidered, taking into account the incapacity of capitalism to create jobs.

6. Identification of laws and regulations that should be introduced into Latin American countries in order to improve the quality of their institutions and reduce corruption.

This session focused on highlighting the fact that the main problem in most Latin American countries is not that they lack of adequate legislation for improving institutional quality and the struggle against corruption, but the fact that these laws are regularly broken.

One participant claimed that foreign pressure on the Legislative Powers to pass laws responding to interests alien to the needs of a country creates distortions which are a form of corruption. He added that when a Legislative Power passes regulations free from any kind of pressure, there may be a direct positive effect against the causes of social and economic inequity, e.g. by passing laws establishing direct, progressive taxation.

Another participant added that lack of regulations is not what prevents corruption from being tackled, because the main regulations that should enable the democratic system to be improved are in force. Nevertheless, he considered that further regulations should be added so that the mandates of public representatives could be repealed.

It was also said that Latin American Legislative Powers should address the problem of tax evasion in the framework of tax legislation. It was pointed out that in Argentina the Supreme Court has jurisprudence to tackle the various means by which multinational companies avoid paying income tax, such as self-loans, intercompany purchase of technology and others.

It was also mentioned that delegating faculties corresponding to the Legislative Power in the Executive Power is a form of corruption, and that emergency decrees are a means of encroaching on the Legislative Power and facilitate corruption in institutions which already have a high level of systemic corruption.

A participating economist pointed out that if Argentine tax legislation were comparable to tax legislation in countries like the USA regarding taxes paid by companies, Government revenue would increase and several methods of tax evasion used by companies would be stopped.

It was also proposed to establish very precise regulations regarding how much money political parties should be allowed to spend on election campaigns, and that the State should subsidize campaign expenses, to allow equal opportunities to all parties and limit campaign expenditure.

At the same time, it was recognized that in most countries there is no political decision to implement mechanisms that would enable grassroots representation to be improved.

7. Identification of ways to foster the development of transparent, informed grassroots organizations and channels of communication between citizenship and the Executive and Legislative Powers in Latin America.

During the final session at the Second Workshop, an analysis was made of how to create transparent grassroots organizations that could generate specific proposals for tackling inequality and exclusion.

The need to create movements that could transform society was stressed. Equally, it was pointed out that in Argentina at least, the defect of the prevailing productivist model is that it does not include adequate corrections to prevent the social consequences it causes. The challenge is therefore how to influence economic and political decision-makers, particularly in the State, so that their decisions are conducive to confronting inequality.

One participant introduced the concept of "*quotidian acquisition*" as a means of understanding the processes of inequality. The term refers to the demands and activities arising from a set of entitlements (property, contracts, etc.) and a set of responsibilities which the State cannot renounce without a severe further loss of social equity and quality of life of vast sectors of the population (e.g. health and education). Entitlements are classified according to whether they are accessed (a) directly (such as jobs and property), (b) indirectly (such as those acceded through institutions, communities or associations) and (c) via the via the citizen-State relationship.

The participant added that this quotidian acquisition thus takes place in an institutional environment comprising economy, State, society and culture. As its scope is so wide, there were said to be various courses of action to confront the inequalities and inequities manifested in the quotidian non-acquisition of the needy. Particularly, without effective governableness, there can be no justice and inequity cannot be tackled, and without respect for human rights, no actor, company, institution or State can be legitimate.

Another participant suggested looking at the processes of achieving and establishing democracy in two stages:

- A first stage during which democracy should be sought and consolidated, after authoritarian or dictatorial regimes.
- A second stage during which democracy should be criticized and improved upon, so that it evolves from a formal democratic model to a democracy able to renew party leadership and party democratization.

It was also stated that within this framework, the following points are key:

- Grassroots organizations should work as "citizen watchdogs" capable of carrying out "democratic auditing" and pointing out flaws in the workings of democracy.
- The concept of citizenship should be redefined so that it implies: (a) a recovery of citizen rights; (b) a continuous follow-up of how social institutions work (e.g. the prison system), and (c) the involvement of the media to broadcast the results of these continuous auditing processes.
- Overcoming poverty and exclusion, a problem that will take time to solve and requires social leaders who are better prepared to question the economic decisions taken by companies and the State.

Report on International Student/Young Pugwash

Report

by Arthur Petersen and Juan Pablo Pardo-Guerra

In the first half of 2005, International Student/Young Pugwash (ISYP) achieved significant progress in several of its projects. First of all, the ISYP Board, together with Ms. Wakana Mukai from Japan, undertook to organize the ISYP Hiroshima conference as part of the 55th Pugwash Conference on Science and World Affairs.

In January 2005, the first issue of the new internationally peer-reviewed journal *ISYP Journal on Science and World Affairs* went online (see www.student-pugwash.org/journal). We have benefited from the strong involvement of several Pugwash Council members and other seniors in providing us with advice and performing reviews on papers. The substance of the second issue is ready pending final editorial processing. A grant proposal has been prepared and will be sent to the Netherlands Ministry of Foreign Affairs for producing and distributing a printed edition of the journal, in the form of yearbooks.

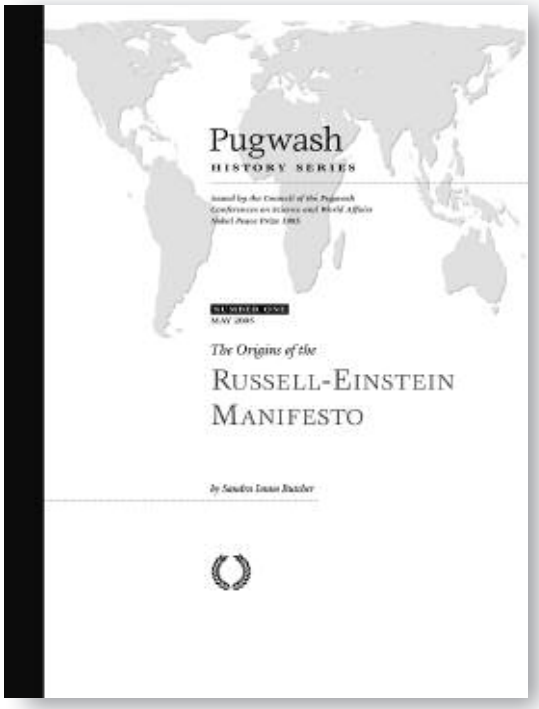
The *Global Seminar Network* was created as a means to introduce students throughout the world to the topics and perspectives of the Pugwash community. Taking advantage of the high mobility of the Pugwash community (many of whom are involved in academic activities and travel extensively throughout the world), we have organized a network of seminars which enable the transmission of the expertise of the broader Pugwash community to the younger generation. Two such seminars have taken place over the past year. In December 2004, ISYP, in collaboration with El Colegio de Mexico, organized a small seminar on the future of nuclear proliferation in Mexico City. Panelists included Prof. Francesco Calogero and Ambassador Miguel Marin-Bosch. Then, in May 2005, the Student Pugwash group in the UK hosted a seminar on genetically modified organisms with Prof. Elena Alvarez-Buylla, member of the Mexican Pugwash Group. We expect to expand these seminars in the future in close collaboration with the other members of the Pugwash community.

Finally, in terms of the structure of its organization and Board membership, ISYP has seen some changes recently. At the 2004 Seoul conference, several changes in the legal structure of ISYP were proposed, which were later accepted by the General Assembly. These changes made the statutes, by-laws and Board election guidelines more consistent both with each other and with practice. Furthermore, Jeffrey Boutwell replaced Sir Joseph Rotblat as advisory member in the ISYP Board. The current Board composition is the following: Juan Pablo Pardo-Guerra, Mexico (Latin American seat), Chairperson; Arthur Petersen, Netherlands (unrestricted seat), Treasurer; Benjamin Rusek, USA (North American & Australian seat), Secretary; Moira Goodfellow, Canada (unrestricted seat); Rian Leith, South Africa (African seat); Magdalena Kropiwnicka, Italy (European seat); Nagappan Parasuraman, India (Asian seat); and Jeffrey Boutwell, USA (advisory member from Pugwash Council).

Pugwash History Update

By Sandra Ionno Butcher

The Pugwash History Project is well underway. In May, the new Pugwash History Series was launched with its first publication, a piece I wrote on "The Origins of the Russell-Einstein Manifesto." This 35-page report sets the backdrop for the Manifesto, highlighting the steps Joseph Rotblat, Bertrand Russell, and others took to make the public aware in the 1950s of the dangers involved with the new hydrogen bombs. The report describes in detail the behind-the-scenes discussions occurring between some of the world's leading scientists as they sought to find a way to capture the public's attention, ultimately agreeing to the elegantly worded Manifesto. Pugwashites know that signing this Manifesto was the last public act of Einstein's life. This report provides greater detail into the making of the Manifesto, provides quotes and some biographical information about the signatories, and discusses the media strategy involved with the Manifesto's launch. It contains a foreword by Joseph Rotblat, reinforcing the continued relevance of the Manifesto in today's nuclear world. (This report is available online at www.pugwash.org or contact one of the Pugwash offices for a hard copy.) In addition, I am currently working on a companion PowerPoint presentation to the report, which I will make available by the end of the summer. This presentation will be designed as an "instant event" for anyone wishing to hold a small group discussion on the Manifesto's history.



Research has begun on the second scheduled publication for this Pugwash History Series, which will focus on the role that Pugwash played during the Vietnam War. This summer, we are lucky to have the help of two talented interns in the Washington, DC office, Ben Towbin (Cornell University) and Rob Boutwell (Harvard University, and Jeffrey Boutwell's nephew) who are making considerable use of the US National Archives to help locate additional primary source documents. We have appreciated the advice of experts such as Steven Aftergood at the Federation of American Scientists and William Burr at the National Security Archives.

Jeffrey Boutwell is supervising this project, and we have both been heartened by the increasing dialogue within the Pugwash community on historical matters. We encourage Pugwashites around the world to share with us any resources or personal experiences that you think are relevant to the historical research. We always appreciate receiving copies of any related publications.

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Ruth Adams signing a Commemorative Edition of the Russell-Einstein Manifesto for Thinker's Lodge, Pugwash, Nova Scotia, July 2004

Ruth Salzman Adams
1923–2005

Ruth Salzman Adams, of Chicago, Washington, Basalt, Colorado, and more recently San Diego, succumbed peacefully to cancer at her home on Friday evening, February 25, 2005 in the loving company of her husband of 51 years, Robert McC. Adams, daughters Gail Lorien, Beth Skinner, and Megan Adams, and grandchildren Nico and Gabi Herbst and Reese Adams-Romagnoli.

Born July 25, 1923, she first entered the labor force in 1942 as recreation director in a wartime Oregon shipyard (and was terminated after organizing an interracial dance). A profoundly generous and caring person as well as a principled mover-and-shaker in many non-governmental organizations, her field of action was worldwide. Fellow, American Academy of Arts and Sciences, her edited and co-edited books include works on human migrations, the anti-ballistic missile, and contemporary China. At the time of her death she was a Board member, Trust for Mutual Understanding and the Maki Foundation; and a course director and consultant to the Italian School on Disarmament and Research on Conflict (ISODARCO). Formerly she had been Program Director for Peace and International Cooperation of the John D. and Catherine T, MacArthur Foundation; and prior to that Editor, Bulletin of the Atomic Scientists. She was an original (1957) and continuing participant in the Pugwash International Conferences on Science and World Affairs (with a special attachment to the Student Pugwash movement). In the later decades of the Cold War she frequently had a facilitating role in maintaining the flow of policy-oriented communication and understanding on nuclear issues between senior Western and Soviet scientists.

The breadth of her concurrent activities is suggested by the following: Former Chair of the Institute for Policy Studies; former Trustee, Rocky Mountain Institute; former Board member, Council for a Livable World; former Council member, Federation of American Scientists; former Executive Director or the Illinois American Civil Liberties Union; former Organizing Committee and Governing Board member of the International Centre for Insect Physiology and Ecology in Nairobi, Kenya; former Visiting Scholar, Institute on Global Conflict and Cooperation, University of California, San Diego; former Board member, Women's National Forum, the Chicago Network. Her numerous awards include the Public Service Award of the Federation of American Scientists, the Adlai Stevenson Award for International Human Understanding of the United Nations Association, and the Forum on Physics and Society Award of the American Physical Society.

Ruth Adams followed her own, entirely original calling and path. We hope and expect, as she did, that others will continue to do the same.

—Bob Adams

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26 November 2004

Dear Ruth,

I should have written to you much earlier, soon after you were presented with the devastating diagnosis, but I postponed writing for this very reason: I did not know how to express my feelings without sounding euphemistic or offering anodyne. In place of this, I want to share with you my thoughts about myself.

At 96, and after a stroke and heart condition, my days are obviously numbered, and I am bound to give some thought to my exit.

I have a tremendous respect for human life. To me, every human being is a miracle; the outcome of an infinite number of changes over billions of years, all the time improving this wondrous creature. But as a physicist, I have to acknowledge the laws of nature about the inexorable rise of entropy, which means that the life of each individual is finite. I have accepted this fact, and learnt to live with it, but I have two worries about the exit. One is that it should not be prolonged, in particular that I do not become a burden to those who care for me. The other is of a more fundamental nature: has my life been worth living? Looking back at it dispassionately, I think that the answer is 'Yes'. I hope that those who know me will agree.

I have spent the second half of my life on efforts to ensure the continuation of human life on this planet, and although my objectives, both short-term and long-term, have not yet been achieved, I believe that I have contributed a little towards their achievement.

From what I know of your own life, Ruth, the same applies to you.

With all my love,

Jo

Ruth Salzman Adams

By Jeffrey Boutwell

My wife Sara and I had the good fortune to attend the memorial service for Ruth Adams held on April 10 at the home of Harle Montgomery in La Jolla, California, where Ruth and Bob had been living for several years. The venue, overlooking the Pacific Ocean that Ruth used to walk along with her dogs on so many occasions, was a wonderful reminder of the 52nd Pugwash Conference held at UC, San Diego in August 2002 that Ruth was instrumental in helping to organize. During the conference, Ruth and her good friend Harle arranged a social occasion at the Montgomery house for members of the Pugwash Council and the 30 or so international Student/Young Pugwash members attending the conference. This gathering epitomized Ruth's passionate conviction for bringing together the next generation of scientists and policy analysts with their more 'senior' Pugwash colleagues in order to ensure the continued vitality and relevance of the Pugwash community. The next year, in July 2003 during the 53rd Pugwash Conference, Ruth stood on the porch at Thinker's Lodge in Pugwash, Nova Scotia and reminisced, with Jo Rotblat at her side, about her 46 year involvement with Pugwash which began at that very same family home of Cyrus Eaton.

These two Pugwash conferences, the last two that Ruth attended, symbolized all that she contributed to the success of Pugwash through the years: her bedrock commitment to peace and justice for all peoples, her delight in engaging younger people in lively debates about how we all need to do more to reach those goals, and her sparkle and vitality in touching everyone she met. Ruth will be missed, sorely, but those qualities of hers will always be with us.

Jeffrey Boutwell is Executive Director of the Pugwash Conferences on Science and World Affairs

Ruth Adams Memorial Service

May 22, 2005 • Fulton Recital Hall • University of Chicago

Remarks by Kennette Benedict

Ruth Adams was ambitious for the world. She believed that we could live together without violence, cooperating to solve problems, delighting in our differences, and enjoying ourselves in the company of one another. She was, as we all know, completely honest and direct. She could also be unpredictable, impatient and, yes, even angry. She occasionally terrified her staff at the MacArthur Foundation, when we did not meet the high standards she set for us and herself. She expressed strong opinions, but encouraged creativity and exploration. To work with her was to enter a world where everything was connected to everything else, where curiosity drove exploration, and where questioning was a way of being. She inspired all of us to be better than we could possibly be because she was ambitious for the world.

Ruth believed in the possibility of world peace. I remember listening to a former colleague at the MacArthur Foundation as he told me, in a moment of confidence, about his experiences with Ruth. He spoke about his past frustrations with her, of his inability to follow her intuitive leaps, and her seeming inability to bring coherence and focus to the Peace program's grantmaking. He smiled then, and told me of his great epiphany: Ruth was trying to bring about world peace! As he began to

understand how deeply and utterly she believed in this potential, he finally came to respect her way of approaching philanthropy, and her insistence on an all-encompassing idea of peace through international cooperation.

Indeed, in her thinking about peace and security, Ruth was prescient. She cared little for the debates in the field of international security—about whether states acted as rational actors, whether they balanced one another in world politics, whether they could ever resolve their security dilemmas, or whether multilateralism or world government were desirable or possible. She laughed when I told her after a few weeks of working with her in 1987 that I didn't really know anything about throw weights or force structure. She waved her hand and told me I didn't really need to worry about that sort of thing for now.

She did not care about how people and communities were to be protected from warfare and violence, from destruction by nuclear weapons, from the ravages of environmental degradation, and from the misery of poverty. She simply knew that they must be protected. It mattered not to her where the formal responsibility for that protection might lie—whether with the government of those who were suffering, with other governments, with the United Nations, or with private organizations or groups of individuals. The point is (I can hear her saying) that we are all responsible for one another. Political borders, ideological divides, income differences, religious beliefs mattered not a wit to her.

In fact, her own ideas and impulses and grantmaking foreshadowed the idea of "the responsibility to protect"—the concept that the international community has a responsibility to intervene in countries where governments cannot or will not protect their citizens. And I think she found the idea of "human security" compatible as well—though she disliked the term "security" (except when used in "social security" which of course, she supported). She was concerned that individuals and their communities be protected from violence and fear, and she recognized that governments may or may not be the best instruments of that protection. At bottom, Ruth believed in the public responsibility of private individuals—whether they are scientists, world leaders, scholars or community activists.

Yet I'm not sure she thought the terminology—of human security, of the responsibility to protect—was just right. She knew the power of words, and she hated rhetorical language—slogans that were used too often, that lacked precision, and that no longer connected to experiences and the stories that people told about their lives. For that's what she really cared about—about people, about their nightmares and their dreams, about their troubles and their aspirations.

She was the most deeply affectionate person I have ever known. She saw our warts and flaws while she honored our intelligence and goodness. She loved humanity—one by one. It was out of this robust and demanding affection that she sought world peace.

I miss her. I miss our long conversations—about the state of the world, about the problems in our own country, about books and ideas, about music, food, art and travel, about our friends and about our families. These words, from the poet Yehuda Amichai seem to help:

> Everything that lives and endures
> For more than one day after we die
> Is eternal.
> We live in the eternity of others
> We are their eternity.

So we are Ruth's eternity, and in that I take great comfort. But we also know what ambitions she has for us and for the world. We'd better get busy.

Kennette Benedict is Director, International Peace and Security, at the John D. and Catherine T. MacArthur Foundation in Chicago.

Ruth Salzman Adams

By Mike Moore

Ruth Adams, a steadfast globalist decades before globalism became fashionable, died February 25. She was 81. The organizations that Adams devoted her life to enhancing—the Bulletin,the Pugwash Conferences on Science and World Affairs, and the John D. and Catherine T. MacArthur Foundation—shared and promoted that globalist perspective.

Adams joined the Bulletin in 1953 as an invaluable editorial assistant. At that time, the magazine was located in the basement of the University of Chicago's Social Science Building; former Manhattan Project scientist and Bulletin founder Eugene Rabinowitch was the magazine's editor. Those were dizzy years for Adams. The university's sprawling Manhattan Project lab yielded the Scientists' Movement in 1945; the Bulletin quickly emerged as the forum in which the most brilliant minds of the era discussed the fundamental questions of the atomic age.

In 1957, Rabinowitch, fellow Project scientist Joseph Rotblat, and philosopher Bertrand Russell organized the first Pugwash conference, held at its namesake village in Nova Scotia, Canada. In its early years, Pugwash was designed to cut a hole in the Iron Curtain by bringing together scientists from East and West to work on the technical foundations for arms control. Adams attended the conference in a secretarial capacity. But her brilliance, ebullience, and understanding of the issues impressed nearly everyone and made her instrumental in future conferences.

"[The meeting] was to shape most of the following decades of my life," Adams recalled at a July 2003 Pugwash meeting. She remained a key player in Pugwash until her death.

From 1961 to 1968, Adams — idealistic, plainspoken, and impatient with Cold War cant— worked at the Bulletin as managing editor and then editor. She left the magazine in 1968 to go to the Middle East with her husband, a world-famous anthropologist. She assumed the editorship again in 1978. Jerome Wiesner, former science adviser to President Kennedy, a Pugwashite, and a Mac-Arthur Foundation board member, recruited Adams to join the foundation in 1984. At MacArthur, she instituted the Peace and International Cooperation Program, which supported innovative initiatives throughout the world.

Her interests were vast, but she gave particular attention to the developing world. "Ruth helped found the International Centre for Insect Physiology and Ecology in Nairobi, Kenya," recalls Victor Rabinowitch, who met Adams when she worked for his father at the Bulletin and then worked with her himself as senior vice president of the MacArthur Foundation. "She traveled to Africa as a board member of the center, and to France, Germany, and England to raise money for the center and to get scientists involved." The center, still going strong, combines basic and applied research in an effort to control tropical insects that kill livestock by the millions, devastate crops, and spread disease.

Adams also invested much time and energy in developing the next generation of thinkers. "She was never condescending," recalls Sandy Ionno Butcher, former executive director of Student Pugwash USA and a longtime friend of Adams's. "She made us feel as though we had something special to contribute. She

shared with us her enthusiasm, friendship, contacts, and belief that young people can and must play a role in determining the future."

This was Adams's true legacy, Rabinowitch believes. "She inspired thousands of young people to get involved with and contribute to the issues of peace and social justice, not only through professional careers but through their work with civic institutions everywhere," he says. "To Ruth, public service was a privilege, rather than a chore."

Mike Moore is the Bulletin's contributing editor. He can be reached at m-smoore@ socket.net. May/June 2005 Bulletin of the Atomic Scientists

Hans Bethe

1906–2005

Hans Bethe died on March 7, 2005 at the age of 98 in Ithaca, New York. He was a master physicist, who won the Nobel Prize in 1967 for his work on the nuclear reactions that fuel the sun, and who continued to publish in physics well into his nineties. During World War II he served as head of the theoretical physics division in the Manhattan Project at Los Alamos, but after the war he was among the group of physicists who argued for international control of atomic weapons. He was a member of the U.S. scientific delegation to the 1958 Geneva Conference which eventually resulted in the Limited Test Ban Treaty of 1963. He played an important role in the 1960s debate over antiballistic missile systems, and the article that he and Richard Garwin published in *Scientific American* in 1968 criticizing the ABM program on technical grounds was influential both in the United States and the Soviet Union. In 1995 on the 50th anniversary of the bombing of Hiroshima, Bethe issued a call to scientists all over the world to stop work on weapons of mass destruction.

Hans Bethe was also a Pugwashite, having attended the 8th Pugwash Conference, Disarmament and World Security, held in Stowe, VT in September 1961. He was not active in Pugwash in subsequent years, but he was nevertheless of great importance to the movement as an example and mentor to generations of scientists. In his commitments to science and public service, his enormous integrity, and his steadfast belief that scientists had a responsibility to contribute to public debates on nuclear weapons and international security more generally, he exemplified the ideals that animate Pugwash. At Cornell University, his home for almost 70 years, and elsewhere, his example created a tradition that legitimizes the participation of scientists in public life and provides a model of how to do it. In this, as much as in his scientific achievements, his legacy lives on.

—Judith Reppy

H. Bentley Glass

1906–2005

H. Bentley Glass, a world renowned geneticist and frequent participant in the early years of Pugwash, died in January 2005 at the age of 98.

Prof. Glass was a longtime faculty member and former Vice President of Stony Brook University in New York. He was born and raised in China, the son of missionary parents, and later graduated from Baylor University. In addition to his years at Stony Brook, Prof. Glass taught at Johns Hopkins University, was a member of the National Academy of Sciences, and a past president of Phi Beta Kappa.

Having attended the 3rd Pugwash Conference, *Dangers of the Atomic Age and What Scientists Can Do About Them*, in Kitzbühel, Austria in September 1958, Prof. Glass went on to participate in a total of sixteen Pugwash meetings, the last being 22nd Pugwash Conference, *Scientists and World Affairs*, held in Oxford, UK in September 1972.

The author of more than 200 scientific, professional and general articles, Prof. Glass was well known for his interest in the social responsibility of scientists, and accordingly was a mainstay of the early Pugwash efforts to spread such values throughout the international scientific community.

Ziro Maki

1929–2005

Ziro Maki died May 31, 2005 in Kyoto, Japan at the age of 76. As a Japanese Pugwashite he attended six Pugwash meetings from 1974 *(the 24th Pugwash Conference held at Baden, Austria)* to 1995 *(the 45th Conference held at Hiroshima, Japan)*. The Japanese Pugwash Group was founded by Hideki Yukawa (1907-1981; a signatory to the Russell-Einstein Manifesto; Nobel Laureate in Physics 1949), Sin-itiro Tomonaga (1906-1979; Nobel Laureate in Physics 1965) and Shoichi Sakata (1911-1970) just after the first Pugwash Conference in 1957 and was called the Kyoto Conferences of Scientists from 1962 to 1980's. Ziro Maki was a core member of the group. After passing away of the above three founders he served as a member of the Continuing Committee with Toshiyuki Toyoda and Soichi Iijima until 1992.

He was graduated from Tokyo University of Education in 1952. He studied theoretical physics supervised by Tomonaga at the Graduate School of the University. He started his career at Nagoya University in 1955 as research assistant. He was promoted to research associate, then associate professor. Ziro Maki stayed there until 1966. He collaborated to Sakata.

In 1962 the existence of two kinds of neutrinos (electron neutrino and muon neutrino) was confirmed experimentally. With Sakata and Masami Nakagawa he predicted the neutrino oscillation in the same year. They claimed that, if these neutrinos have different masses, once a neutrino is produced it changes to the other kind of neutrino and interchanges from each other with passage of time. This neutrino oscillation was discovered experimentally in 1998. They were really foresighted physicists.

Ziro Maki moved, as a professor, to Research Institute for Fundamental Physics, Kyoto University, where Yukawa was Director since its inauguration in 1953. After Yukawa's retirement in 1970 Ziro Maki was elected to Director of the Institute. He served as Director for 12 years in total.

He was in the service of President, Physical Society of Japan; a member of the Science Council of Japan and many other administrative positions.

For his achievement in science the Nishina Memorial Prize was awarded to him in 1977 and the Soryushi (elementary particles) Medal in 2002.

Ziro Maki was the author of many articles and books on elementary particle physics; history of modern physics; philosophy of sciences; science and world affairs including "Is abolition of nuclear weapons possible" (1984, Iwanami Shoten Publishers, Tokyo) and "An idea for non-nuclear-weaponization of the Pacific Ocean". (1990, Iwanami Shoten Publishers, Tokyo). These two books were publication of the Kyoto Conferences of Scientists and were edited by Ziro Maki with Toshiyuki Toyoda and Soichi Iijima.

He is survived by his wife Aiko and three sons.

As a friend for more than fifty years I express my sincere condolences with the Pugwash Community to his family.

—Michiji Konuma, Pugwash Japan

Pugwash Council for the 2002–2007 Quinquennium

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Calendar of Future Pugwash Meetings

22–27 July 2005 Hiroshima, Japan	55th Pugwash Conference on Science and World Affairs, *60 Years After Hiroshima and Nagasaki*
26–27 September 2005 Krasnodar, Russia	Pugwash Workshop on *Civil-Military Relations in Conflict Regions: North Caucasus and Georgia*
29 Sept.–2 Oct. 2005 Ajaccio, Corsica	3rd Pugwash Workshop on *Science, Ethics and Society: Ethical Dimensions of HIV/AIDS in Developing Countries*
3–4 December 2005 Geneva, Switzerland	23rd Pugwash Workshop on the *Implementation of the Chemical and Biological Weapons Conventions*

2006

March 2006 Nairobi, Kenya	Pugwash Workshop on *Security Architecture in the Horn of Africa*
March 2006, Chennai, India	Fourth Pugwash Workshop on *Threats Without Enemies: The Security Aspects of HIV/AIDS*
November 2006 Cairo, Egypt	56th Pugwash Conference on Science and World Affairs

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