

## **Preparing for the BWC Seventh Review Conference in 2011**

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Two workshops were held in Beijing, China in the week of 31 October to 6 November 2010 which were both preparing for the Seventh Review Conference of the Biological Weapons Convention to be held in 2011. The first workshop on 31 October to 3 November 2010 was organised by the Chinese Academy of Sciences (CAS), the US National Academy of Sciences (NAS) and the InterAcademy Panel (IAP) Biosecurity Panel together with the International Union of Microbiological Sciences (IUMS) and the International Union of Biochemistry and Molecular Biology (IUBMB) and entitled *Trends in Science and Technology Relevant to the Biological and Toxin Weapons Convention*. The second workshop on 4 to 6 November 2010 was organised by the Government of China and the Government of Canada together with the Implementation Support Unit (ISU) of the Biological Weapons Convention (BWC) and entitled *Strengthening International Efforts to Prevent the Proliferation of Biological Weapons: The Role of the Biological and Toxin Weapons Convention*.

### **Trends in Science and Technology**

The first workshop was held in the Institute of Biophysics of the Chinese Academy of Sciences at 15 Datun Road, Chaoyang District, Beijing. It was attended by 78 participants from 28 countries (Australia, Austria, Brazil, China, France, Germany, India, Indonesia, Israel, Japan, Jordan, Kazakhstan, Kenya, Lithuania, New Zealand, Nigeria, Norway, Pakistan, Philippines, Poland, Russia, Singapore, South Africa, Sweden, Uganda, Ukraine, United Kingdom, and United States of America) and the UN (UNODA and ISU). Many of the presentations made at this workshop are available at: <http://dels.nas.edu/Past-Events/Trends-Science-Technology-Relevant/DELS-BLS-09-06>. Following a reception and welcoming remarks from the sponsoring organisations on the evening of 31 October, the Plenary Session 1 on the morning of 1 November addressed the themes, goals and context of the workshop.

### **Themes, Goals and Context**

A welcome address was given by the Tao Xu, the Director-General of the Institute of Biophysics. Then Rod Flower, of Queen Mary College of the University of London, outlined the aims and objectives of the workshop, noting that the Review Conferences of the BWC took place every five years and that the next one would take place in 2011. As one of the requirements in the Convention was that at the Review Conferences ... *shall take into account any new scientific and technological developments relevant to the Convention*, the aim was that the report of this workshop should be published by Spring 2011 so that it be taken into

consideration at the Review Conference later in the year.

Piers Millet of the Implementation Support Unit then gave a brief overview of the BWC. He noted that the number of contributions on the relevant developments in science and technology had been 2 at the 1st Review Conference, 7 at the 2nd Review Conference, 8 at the 3rd Review Conference, 6 at the 4th Review Conference, 5 at the 5th Review Conference and 10 at the 6th Review Conference. He also noted that there had been increased involvement of scientists in the annual meetings – notably at the Meetings of Experts – when scientists had taken part as members of delegations, as guests of the meeting and as NGOs. The scientists had also participated in presentations, in panel discussions, in poster sessions, in side events and in speed networking.

Ralf Trapp then gave an introduction to a framework for evaluating new science and technology, drawing upon what had happened in regard to the similar requirement to consider relevant advances in science and technology for the Review Conferences of the Chemical Weapons Convention (CWC). He pointed out that the International Union of Pure and Applied Chemistry (IUPAC) had held a workshop prior to each of the CWC Review Conferences and had published its reports of these workshops and made them available to the States Parties to the CWC.

The final presentation in the first session was a perspective from the Chinese Academy of Sciences given by Li Huang, the Director-General of the Institute of Microbiology.

### **Developments in Design, Fabrication and Production**

These were addressed in Plenary Sessions 2 and 3. Plenary Session 2 consisted of presentations on bioinformatics and computational tools by Etienne de Villiers from the International Livestock Research Institute in Kenya; on systems biology by Andrew Pitt of the University of Glasgow in the UK; and on emerging trends in synthetic biology by Pawan Dhar of the University of Kerala in India. Plenary Session 3 consisted of presentations on bioreactors and transgenic animals by Ryszard Slomski of Poznan University in Poland; on transgenic plants and recombinant pharmaceuticals by Julian Ma of St George's University of London, in the UK; and on neuroscience developments by James Eberwine of the University of Pennsylvania School of Medicine in the USA.

### **Dispersal and Delivery**

Plenary Session 4 consisted of presentations on aerosols and aerobiology by Chad Roy of Tulane National Primate Research Center in the USA; Nanocomposites as delivery systems by Jackie Ying of the Institute of Bioengineering and

Nanotechnology in Singapore; and a commentary on the implications stemming from advances in dual-use targeted delivery systems made by Kathryn Nixdorff of the Darmstadt University of Science and Technology in Germany.

### **Breakout Session 1**

The participants then divided into four groups which met in separate breakout sessions for two hours at the end of the first afternoon to consider four questions:

1. Based on the presentations thus far, what are the likely major developments over the next five years?
2. Are those changes likely to affect the development or emergence of biological weapons?
3. Are there technical hurdles before these technical developments become a cause for concern?
4. How can future developments be tracked in regard to creation of a biological weapon or as defences and countermeasures?

Rapporteurs from the four groups then gave feedback in Plenary Session 5 at the start of Tuesday morning.

### **Detection, Identification and Monitoring**

Plenary Session 6 consisted of presentations on postgenomic technologies by Andrew Pitt of the University of Glasgow in the UK; on exploring an international microbial forensics capability to support attribution and advance global biosecurity by Randall Murch of the Virginia Polytechnic Institute and State University in the USA; on a biosensors overview by Gary Resnick of the Los Alamos National Laboratory, USA; on biosensor development by Ilya Kurochkin of the M V Lomonosov Moscow State University in Russia; and a brief summary on the science used in identifying the anthrax attacks of 2001 was made by Nancy Cornell of the University of Medicine and Dentistry of New Jersey in the USA.

### **Defence and Countermeasures**

Plenary Session 7 consisted of presentations on vaccines and medical countermeasures by Nancy Cornell of the University of Medicine and Dentistry of New Jersey in the USA; on the monitoring and molecular diagnosis of emerging infectious diseases by Raymond Lin of the National Public Health Laboratory of Singapore; and on agricultural security issues by Michael Jeger of Imperial College London in the UK.

### **Breakout Session 2**

A second breakout session involving the same four groups as before took place after lunch on Tuesday 2 November. The questions considered were very similar to those considered in the first breakout session.

Rapporteurs from the four groups then gave feedback in Plenary Session 9 at the start of Wednesday morning.

### **Communication**

Plenary Session 8 consisted of presentations on how the internet has changed scientific interchanges by James

Meadway of the Royal Society, London in the UK; on the influence of technology on scientific collaboration by Herawati Sudayo of the Eijkman Institute for Molecular Biology in Indonesia; and on conveying the concept of risk by Terence Taylor of the International Council for the Life Sciences in the USA.

### **Workshop Conclusions**

On the Wednesday morning after the feedback from the rapporteurs in Plenary Session 9, the final Plenary Session 10 considered the conclusions from the Workshop in a session chaired by Rod Flower of Queen Mary College, University of London.

### **Reflections on the CAS/NAS/IAP workshop**

This workshop saw an excellent interchange between those who are closely engaged with the Biological and Toxin Weapons Convention and with specialists in the various areas of the life sciences that are of relevance to the Convention. It was noted that, in regard to Review Conferences, although Article XII specifically states that *Such review shall take into account any new scientific and technological developments relevant to the Convention*, there is little discussion of these developments at the Review Conference itself. There was discussion as to whether the relevant advances in science and technology should be considered more frequently than at the 5 years intervals of the Review Conferences. Whilst it would be possible to create a framework in which such more frequent consideration could take place, it was necessary to consider what the States Parties would actually do with the outcomes of such considerations. There was an appreciation that resources are limited and consequently the States Parties would want to prioritise what their efforts addressed, and thus perhaps other activities – such as national implementation, biosafety and biosecurity, and preparedness for outbreaks whether natural, accidental or deliberate – had a higher priority.

An important point that became evident was that the advances in science and technology have implications not only for Article I of the Convention but also for Article IV National Implementation, and for other Articles in regard to biosafety and biosecurity; outreach and education; preparedness for outbreaks of disease in humans, animals or plants whether natural, accidental or deliberate; and international collaboration. Consequently, the Article by Article Final Declaration at the Review Conferences should include language addressing the relevant advances in science and technology in several Articles.

It was also recognised that more needed to be done to build closer links and improve communications between the delegations of States Parties and their scientific academies and associations. There would be benefits from steps being taken by all States Parties to institutionalise such links, as this would make it easier for national policy makers to be aware of the implications that advances in science and technology may have with regard to the various Articles of the Convention. There would equally be benefits in the reverse direction, as those engaged in the life sciences would become better aware of the obligations of the Convention and of SCR 1540, thereby improving education and outreach as well as biosecurity.

Another useful point was the recognition of what the Biological Weapons Convention can do. The States Parties can agree extended understandings that help to interpret the treaty; the States Parties can call upon individual States Parties to take particular actions in order to implement the Convention; the States Parties can consider and address specific issues; and States Parties can establish specific follow-on work and can establish a framework in which such work will take place.

Advances in bioforensics show what can be done towards achieving a high confidence determination of whether an outbreak is natural, accidental or deliberate. In addition, the objective of determining attribution – to who had caused the outbreak and where the material had come from – would contribute to a more robust global biosecurity preparedness and serve as a significant deterrent.

It was evident that improved global preparedness for outbreaks of disease in humans, animals and plants whether natural, accidental or deliberate, required global cooperation between the intergovernmental organizations – the WHO, the OIE and the FAO/IPPC – and the States Parties to the Biological and Toxin Weapons Convention. As was said many times, diseases know no boundaries, and there is great vulnerability to disease outbreaks amongst humans and in the food chain in animals and plants. There was a particular awareness of the vulnerability of the food chain, and a recognition that more needs to be done in regard to disease surveillance in plants.

In a like vein, it was recognised that there is a need to increase the awareness of the life sciences community – and also of the other international treaties concerned with the life sciences (such as the Convention on Biological Diversity and the Cartagena Protocol on Biosafety) – with regard to the obligations of the Biological and Toxin Weapons Convention and the need to address biosecurity both nationally and internationally.

### **Strengthening International Efforts to Prevent the Proliferation of Biological Weapons: The Role of the Biological and Toxin Weapons Convention**

The second workshop was held in the Asia Hotel at 8 Gongti Beilu, Xinzhong Xijie, Beijing, a location close to the Ministry of Foreign Affairs. It was attended by 84 participants from 32 countries (Afghanistan, Algeria, Argentina, Australia, Brazil, Canada, Chile, China, Cuba, France, Germany, India, Indonesia, Iran, Japan, Jordan, Kyrgyzstan, Malaysia, Mexico, Morocco, Netherlands, Norway, Pakistan, Philippines, Republic of Korea, Romania, Russian Federation, Saudi Arabia, South Africa, Switzerland, Ukraine, United Kingdom and the United States) and nine organisations (European Union, InterAcademy Panel, International Federation of Biosafety Associations, Interpol, University of Bradford, United Nations Office for Disarmament Affairs, VERTIC, Wilton Park and the World Organisation for Animal Health (OIE)). Many of the presentations made at this workshop are available at: [http://www.unog.ch/80256EE600585943/\(httpPages\)/B2986EAA391AB86FC12577D600441ED4?OpenDocument](http://www.unog.ch/80256EE600585943/(httpPages)/B2986EAA391AB86FC12577D600441ED4?OpenDocument).

The opening session was addressed by the Assistant Foreign Minister of China, Liu Zhenmin, by Ambassador

Marius Grinius of Canada and by Richard Lennane, Head of the Implementation Support Unit. The Foreign Minister said that *global issues such as terrorism, proliferation of weapons of mass destruction (WMDs) and the spread of pandemics are becoming more urgent, posing significant challenges to international security and domestic social development*. He went on to add that *Since its entry into force, the Biological Weapons Convention (BWC) has played an irreplaceable role in eliminating the threat and preventing the proliferation of biological weapons and promoting the peaceful use of biotechnology*. After noting the current state of the Convention, he noted *Having said that, we should also note that universalization and effectiveness of the BWC needs to be improved. We hope that more States Parties would submit Confidence-Building Measures (CBMs) with better quality*. He concluded by saying that *this workshop will undoubtedly provide a good opportunity for all parties to have in depth discussions on the issues related to the upcoming Conference. I hope we can have open and candid discussions, build up consensus and contribute to the success of the Seventh Review Conference*.

Ambassador Grinius said that *For nearly 40 years, the Biological Weapons Convention has prohibited an entire category of arms, has renounced them as “repugnant to the conscience of mankind,” and has stood as an essential pillar of international peace and security. However, the treaty has only a limited framework for accountability or transparency, which could lead States Parties to solve their differences bilaterally in a confrontational manner. Furthermore, there are a number of ways that the treaty needs improvement. Universality is something we still need to strive for. Many States that are parties to the treaty also lack the means to properly implement it domestically, either legally or practically. Several countries have indicated a desire for assistance in developing not only their legislation, but also the appropriate programmes for implementing those laws in practice. They also need assistance in developing their own domestic disease surveillance capacity, as only through early detection and treatment can the devastation of a biological weapons attack be stunted*. He then went on to say: *I sincerely believe that the timing and theme of this workshop will allow member-states to focus on challenges facing the Convention well in advance of next year’s Review Conference. It is my hope that this workshop will not only produce animated discussions, but also concrete results*.

Richard Lennane said that *the Seventh Review Conference next year is an important opportunity to take the Convention forward to meet the challenges of the 21st century. It is the best chance we have had for more than ten years to make significant progress. It is a big responsibility, and we must prepare carefully and thoroughly. I hope you will find this workshop a useful and constructive part of those preparations. I encourage you all to participate actively and speak freely: now is the time to share bold ideas and to stretch the imagination. .... So please, make the most of this opportunity to share your views and help shape the future of the Convention*.

## Part I: The Evolving Context

**Session I** provided an *Overview* entitled *The story so far: addressing the biological threats in the 2000s*, with presentations by Graham Pearson (University of Bradford, UK) and Mark Smith (Wilton Park, UK).

Graham Pearson outlined the developments under the Convention from entry into force to the Intersessional Process between the Sixth and Seventh Review Conferences. He noted what had happened at the last Review Conference and emphasized the importance of submitting ideas prior to the Review Conference itself, as the three weeks of the Review Conference are tightly packed and there is little time to develop and agree consensus language. He urged that consideration be given to the early appointment of Friends of the Chair to undertake open-ended consultations on language for the Decisions and Recommendations section of the Final Declaration.

Mark Smith described the Wilton Park Conference held in September 2010 on *Prospects for the 2011 Review Conference*, which was attended by 61 participants from 22 countries and 4 institutions. He outlined the substance of the programme of the conference and concluded by listing the six topics on which there had been consensus that these would be decisive at the Review Conference:

1. Advances in science and technology and the implications for many aspects of the BWC regime
2. The role of industry
3. Confidence-Building Measures where there was consensus that these need further development
4. The intersessional process and the future of the ISU
5. Article X
6. Compliance

Finally, he noted that although the consensus on securing the future of the BWC appears to be quite robust, the vision of how the BWC works and how it should develop is less clear.

**Session 2** was entitled *Assessing the biological threat to international security*. It began by considering *The threat from non-state actors and bioterrorism* with presentations by Abderrazzak Laassel of the Mission of Morocco to Geneva and Chris Parks of the State Department, USA.

Abderrazzak Laassel said that the challenge to biological security is two-fold: firstly, both developed and developing countries must benefit from a strong global public health regime that controls disease outbreaks and builds local capacity to sustain the health of their citizens. Secondly, that there is a need to promote the promising side of biotechnology and to protect against its dark side. A new regime for biotechnology safety and security must be introduced. He then went on to consider how these shortcomings relate to the BWC, and concluded by saying that *the 7th review conference should seize the opportunity to explore means for the establishment of a permanent mechanism for strengthening the cooperation between UN Agencies dealing with the fight against bioterrorism, namely Interpol, WHO, World Organisation for Animal Health, and FAO*.

Chris Park gave an overview of the biological threat today in which he felt that the non-state actor threat was more likely in the near term. However, different governments have

different perspectives regarding the future threat and these perspectives are likely to continue to vary. In looking ahead to countering the threat, there are benefits in effecting and assisting national implementation of the BWC. There would be benefits in future in adopting a broader and more flexible approach than the current inflexible specific topics of the intersessional process. More emphasis needed to be put into national implementation – through legislation, regulation and enforcement, thus dispersing knowledge of the dangers and of the prohibitions.

This session then continued with Richard Lennane of the ISU considering *Strengths and weaknesses of the existing mechanisms: the BWC and its evolving role*. He began by summarising the strengths and weaknesses of the Convention, noting that the strengths were the clear comprehensive ban with no exceptions and few loopholes and the strong international norm. The weaknesses listed were:

- *No organisation or implementing body*
- *No systematic monitoring of implementation or compliance*
- *No systematic assessment of needs or provision of assistance*
- *Uneven national implementation*
- *No mechanism for investigating alleged violations*
- *Conceived to deal with state-based BW programs: covers bioterrorism only indirectly*

He went on to summarise the new approach to strengthening the BWC as being:

- *Focus on improving and coordinating national implementation of BWC*
- *Annual work programme deals with specific topics; exchange of technical expertise*
- *Range of different actors and organisations involved*
- *Implementation Support Unit coordinates activity*
- *Renewed focus on CBMs, universalization*

A new vision was expressed for the BWC based on mutual cooperation that brought together Articles I and III together with Article X, thereby arriving at a situation in which *cooperation reduces risks; reducing risk encourages cooperation*.

There was then a lively discussion covering many aspects. A particular point was made that discussions about non-state actors always tend to focus on attacks on humans. It was argued that non-state actors might cause much more harm through attacks on the economy and food chain of countries. In particular, FAO needs to pay much more attention to disease surveillance and management.

Further discussion considered whether negotiations should be resumed to establish a legally binding agreement for a multilateral verification mechanism. It was, however, pointed out that, rather than trying to go back to the draft protocol of 2001, there had been significant changes over the past decade and that there are now more ways in which to move forward.

**Session 3** was entitled *Developments in science and technology and their implications for biological arms control*. It began with *Challenges and opportunities for dealing with the implications of rapidly changing technology*, a presentation by Andrzej Gorski of the Polish Academy of Sciences speaking on behalf of the InterAcademy Panel. Gorski gave a personal reflection of the workshop held

in Beijing at the beginning of the week, and organised by the Chinese Academy of Sciences, the National Academy of Sciences and the InterAcademy Panel. A report on this workshop will be published early in 2011. He outlined the scope of the discussion, mentioning some of the recent advances in science and technology. He noted that more needed to be done on the education of scientists about the risks associated with dual use, and that there was a need for more effective cooperation with industry as well as for building bridges between the scientific community and policy makers.

The session continued with a presentation by Lorna Miller of the Defence Science and Technology Laboratory in the United Kingdom entitled *Methodologies for assessing biological risks and threats*. This was illustrated by various matrices, including a plausibility matrix addressing likelihood and vulnerability, an impact matrix relating impact to dimension (or scale of the event), a risk matrix relating impact to plausibility, and an urgency matrix relating threat to risk thereby indicating the importance of mitigation. These were all brought together showing how risk and risk management together lead to a mitigated risk.

In the subsequent discussion, various points were made in regard to the workshop held earlier in the week. Notably, that the advances in science and technology are relevant to various Articles of the Convention: to Article I, to Article IV where education and outreach are especially important as well as in regard to biosafety and biosecurity, to Article V and VII in respect of bioforensics and attribution, and to Articles III and X in regard to preparedness for outbreaks of disease, whether natural, accidental or deliberate. The point about building closer links between the scientific community and the policy makers was also emphasized.

**Session 4** was entitled *National Approaches*. It began with a presentation on *Effective implementation: legislation, biosecurity and export controls* by Jesus Domingo of The Philippines. He outlined the various activities being undertaken by the Philippines in regard to biosafety/biosecurity, implementing legislation and export controls, showing how the different agencies in the Philippines and regional cooperation, notably in ASEAN, were helping to make progress.

The session continued with a presentation on *Capacity and preparedness: disease surveillance, investigation and response* by Kazuaki Miyagishima of the World Organisation for Animal Health (OIE). This noted that animal disease agents could be used as bioweapons, as there was increased global vulnerability arising from food, globalisation and climate. OIE member states are responsible for global disease surveillance and reporting significant disease events to the OIE. OIE disseminates these official reports from member states to all other member states via an alert system, and to the public via WAHID (World Animal Health Information Database) thus providing a parallel mechanism to the WHO's International Health Regulations (IHR). Information was also presented about the Global Early Warning and Response System (GLEWS) which provides joint disease tracking by OIE, WHO, and FAO and thus combines and coordinates the alert and response mechanisms of these three agencies. In regard to building the biosafety/biosecurity capacity of laboratories, he pointed out that although BSL (Biological

Safety Laboratory) definitions and Laboratory Quality standards exist, there are no *internationally applicable guidelines* or *certifiable international standards* for biosafety/ biosecurity.

The subsequent discussion covered a wide range of topics including an outline of the disease surveillance system in China and discussion about raising awareness and education. It was recognized that there are two main groups of stakeholders – first, those concerned in governments with implementing national legislation and export control laws, and secondly, those concerned with the responses to outbreaks of disease such as health, consequence management and operational units. Both of these groups, as well as those engaged in the life sciences, need to be educated and aware of the obligations under the Convention. In regard to national implementation, whilst some progress has been made, there is still a long way to go. There is a need for a national implementation Action Plan and for the engagement of regional, subregional and national agencies concerned with the Convention and for greater cooperation and coordination between States Parties. The OIE noted that it was holding an International Conference in December 2010 at which consideration would be given to the basic building blocks for implementation. Consideration should be given to whether BWC components could be included in the legislation.

**Session 5** was entitled *International Approaches I: Cooperation and Coordination beyond the BWC*. It began with a presentation on *The Importance of Article X: enhancing cooperation between and among BWC States Parties* by Gudadi Bambang Sasongko of Indonesia. He said that Article X gave the right to use biological materials for peaceful purposes and emphasised the importance of cooperation to further development of peaceful purposes. He urged that transparent arrangements were needed between States Parties to implement Article X. He recalled the regional workshops between Australia and Indonesia in 2005 & 2006, a biosafety/biosecurity workshop in Jakarta in 2008, and a workshop of the BWC supporting global health in Oslo in 2009. He noted a further point relating to the importance of strengthening international cooperation, recognising that biological risks could be reduced by building public health capacity both nationally and internationally.

The session continued with a presentation on *Universalizing the BWC: Outreach Efforts* by Volker Beck of Germany. He pointed out that the BWC had currently 163 States Parties, 12 Signatory States and 19 States not signatory. He went on to outline the various options in the universality tool-box and the importance of adopting a coordinated approach with outer States Parties.

The subsequent discussion considered various aspects relating to Article X and its implementation. The point was made that diseases do not recognise boundaries and effective international cooperation is needed both multilaterally and bilaterally. While some argued for a mechanism to implement Article X – which might be part of a mechanism for the full implementation of the Convention – others pointed out that there is already an immense amount of ongoing cooperation and assistance which is part of several nations' implementation of Article X. The importance of improving cooperation and coordination between the various States Parties providing

such assistance was emphasised, and the possible use of the ISU as a clearing house was noted.

In regard to universalization, the desirability of an Action Plan on universalization was noted. It was recognised that there are no real political arguments against acceding to the BWC. The problem with the outstanding States (Signatory and non-Signatory) was almost always a lack of capacity. Provision of assistance to build the necessary capacity offered prospects of making progress towards universalization.

**Session 6** continued with further consideration of the same topic as Session 5, namely *International Approaches II: Cooperation and Coordination beyond the BWC*. It began with a presentation by Trevor Smith of Canada entitled *Weaving the web of prevention: Networking effectively with international organizations (e.g. WHO, Interpol, OIE), other multilateral security fora (e.g. UNSCR 1540) and other relevant initiatives (e.g. Global Partnership)*. He pointed out that biological threats are global in that disease presents serious threats to mankind – whether a result of natural disease, of a deliberate attack or of a terrorist or criminal threat. Consequently global solutions are required to strengthen global biological security by States Parties in partnership with international public and animal health agencies and security fora. He pointed out the need for an integrated approach that brought together those concerned with human health, animal health, plant health and security concerns. In regard to the security-health interface, he pointed out that the same preparations are needed to prepare for an outbreak of disease, whether it is natural or deliberate. He concluded by noting that there was a need for more effective bilateral partnerships and emphasized that there needs to be clarity as to what help is required for enhanced assistance and enhanced cooperation.

The session continued with a presentation entitled *In many hands: the role of scientists, education and the civil society* by Anwar Nasim of Pakistan. He started by noting that out of the last 20 Nobel prizes, some 12 have been awarded for discoveries in genetics. He was very aware that there are currently significant developments in synthetic biology and felt that what was needed was education, education and education. This needed to start very young, so that those engaged in the life sciences are aware of the issues.

In the subsequent discussion, it was recognised that some 23 countries are working together in the Global Partnership for strengthening biological security which had effectively gained momentum since 2006/2007, whereas previously emphasis had been on nuclear and chemical issues. It was recognised that a stand-alone BWC was not the way forward but rather a much more an integrated approach with other international organizations such as the WHO, OIE and Interpol. Whilst approaches had been made to the FAO, further discussions are planned to seek their greater engagement. In regard to scientists and education, it was recognised that surveys of the life scientist community in academia around the world had shown that there was a general unawareness of the obligations associated with the Convention and that for effective education and implementation of the Convention, such education and awareness-raising needs to be integrated into an Action Plan on national implementation.

**Session 7** considered *The 2007-2010 BWC intersessional process* with a presentation by Robert Mathews of Australia entitled *Outcomes of the intersessional process: what opportunities were created, and what opportunities were missed?* In this, he recalled the origin of the intersessional process which had been a ‘rescue package’ for the BWC when the Fifth Review Conference reconvened in 2002. The initial intersessional meetings in 2003 to 2005 had been very successful. They had been well attended with many useful discussions carried out in a cooperative harmonious atmosphere resulting in the identification of common understandings, and with States Parties taking effective action in capitals. There was thus a sense of cautious optimism in the lead-up to the Sixth Review Conference, with various ideas being put forward including a decision-making function for the Annual Meetings, various Action Plans, an accountability framework and ideas for a scientific advisory panel. In the event, a second series of intersessional meetings were agreed at the Sixth Review Conference in 2006 for the period from 2007 to 2010. Once again there have been very useful discussions on the agreed topics with many States Parties providing updates on national measures they had adopted since the first intersessional process of 2003 – 2005, and the building of useful cooperative working relationships. There had also been a wider involvement of relevant Government agencies (ie outside the “arms control community”) including health, law enforcement and ‘first responder’ communities. There had also been a greater involvement of, and cooperation with, relevant international organizations as well as with NGOs, academia and scientific academies and associations. This was particularly true at the Meeting of Experts, at which more detailed discussions had taken place. There had also been greater recognition of the role of the national implementation of the Convention, in conjunction with UN SCR 1540, in raising barriers to bioterrorism. Another factor had been the greater recognition of south-south cooperation together with the appreciation that, with the globalisation of the life sciences and biotechnology, there was less relevance to ‘developed’ and ‘developing’ country labels. Opportunities had been missed in regard to universalization largely due to the limited resources of the ISU for such activities and the limited outreach activities undertaken by States Parties. The limited remit for the intersessional meetings also meant that there were few opportunities to explore opportunities for greater cooperation between the ISU and the OPCW given the convergence of biology and chemistry, for mechanisms to increase confidence in compliance through considering the existing CBMs and whether additional ones should be considered.

The session continued with a presentation entitled *What needs to be improved for a future intersessional process* by Ben Steyn of South Africa. In this he recalled that the current mandate is ‘to discuss and promote common understanding and effective action’. The present system has various weaknesses – notably that the mandate lacks any authority to take decisions, and the programme of work has limited scope and is repetitive. There is thus very little substantial outcome. He considered that in any future such intersessional process there should be a mandate for the Meeting of States Parties to make decisions where they agreed

it was appropriate to do so. The Meetings of Experts have been very effective, and should continue with the involvement of the scientific community, industry, scientific associations, and international organizations. However, such Meetings of Experts in future should be focussed on specific areas of work as selected by the Meeting of States Parties –for example, on measures such as CBMs to strengthen the Convention – and then report to the Meeting of States Parties who could then take decisions if they felt it appropriate, or refer the matter to the next Review Conference.

In the subsequent discussion, there was much support for the ideas of moving forward to an annual meeting with the ability to make decisions and of the potential for having some standing working groups that reported to the annual meetings. It was also recognised that there was a need to find a way in which the involvement of the wider scientific community, as well as of industry, could be achieved at meetings similar to those of the Meetings of Experts in the intersessional process thus far. It was also evident that the time was approaching when some kind of scientific advisory process would be appropriate for the BWC – but this would need to be designed to meet the requirements of the BWC. In regard to CBMs there was clearly support for decisions to be taken at the Seventh Review Conference to update the existing CBMs, whilst taking a fresh look in the longer term at the whole issue of how best to build confidence in compliance with the Convention through new CBMs or other measures.

**Session 8** addressed *Objectives and outcomes of the Seventh Review Conference I* with a presentation entitled *Defining success: what are realistic objectives for the Conference?* by Yang Yi, Deputy Director of the Ministry of Foreign Affairs of China. In this she identified a number of topics which might appear in the outcome of the Seventh Review Conference. For each of these topics – verification regime, confidence-building measures, international cooperation and assistance, biological science and technology, the intersessional process and the ISU – she identified what sort of issues needed to be considered and made some suggestions for the Seventh Review Conference. Thus, on a verification regime, she suggested that opinions should be solicited from a wide range of parties prior to the Review Conference, that verification issues might be considered during a future intersessional process, and that commitments might be developed under Articles V and VI of the Convention. In regard to CBMs, she suggested that there should be agreement at the Seventh Review Conference on detailed measures to improve the CBMs and that CBMs should be considered in a future intersessional process. On international cooperation and assistance, she suggested that there might be further discussion on details at the Review Conference and that a workshop or open-ended meeting on international cooperation and assistance might be held prior to the Review Conference. On biological science and technology, she suggested that the Review Conference might review suggestions made during the intersessional process and that agreement might be reached on practical and applicable measures to strengthen biosafety and biosecurity. On the intersessional process, she suggested that the Seventh Review Conference might continue an intersessional programme of Meetings of States Parties and the Meetings of Experts, agree

further discussion on specific issues to strengthen the Convention. Any decisions during the intersessional process should be made by consensus. And finally, on the ISU she suggested that the Seventh Review Conference should expand the Unit's mandate and should have a discussion on its function and scale.

Session 8 continued with a presentation entitled *Practical considerations: developing a consensus outcome* by Ambassador Paul van den IJssel of the Netherlands. He started by emphasizing that a positive outcome requires two things: achieving consensus but also having ambition. He pointed out that the PrepCom – which is expected to be during the week of 11 – 15 April 2011 – deals only with procedural matters, whilst the Review Conference itself – which is expected to be from 5 to 23 December 2011 – is when the substantive work comes to a conclusion. He pointed out that by December 2011, we will need to have a clear idea of the proposals on the table and the scope of a possible outcome. He observed that there is very little chance of developing agreements from scratch during a three-week conference – proposals need to be developed in advance. He stressed the importance of taking every opportunity to share ideas, discuss proposals, and prepare the ground for agreement. The workshop in Beijing and the Wilton Park seminar in September 2010 were a good start, and he encouraged everyone to consider organizing similar workshops and seminars in the course of 2011. He also encouraged the provision of proposals and analyses to the ISU, for posting on the Think Zone for the Seventh Review Conference on the ISU website. (Available at [http://www.unog.ch/80256EE600585943/\(httpPages\)/0FF9CBDC43026888C12577B5004E29E4?OpenDocument](http://www.unog.ch/80256EE600585943/(httpPages)/0FF9CBDC43026888C12577B5004E29E4?OpenDocument)).

He then went on to examine and review the mandate for the Review Conference pointing out that the mandate is both broad and fairly clearly defined. Article XII requires that we cover all the purposes and provisions of the Convention, while the guidance from the Sixth Review Conference and the intersessional process identifies some specific areas needing attention: science and technology, CBMs, the future of the ISU, the intersessional process, cooperation and capacity-building, and universalization, for example. In preparing for a successful outcome, he urged early discussion and putting forward of ideas involving the resources of the broader BTWC community, such as consulting and engaging academics and NGOs, biosafety associations and academies of science, the private sector and others. He also urged that while it is natural to work with like-minded partners in developing proposals, he would also encourage States Parties to discuss their ideas with those who have different interests and priorities. He emphasised that it is important to retain flexibility, to keep an open mind, and to appreciate that there may be several other ways of achieving the aims of a particular proposal. Be creative: look for synergies and mutually beneficial solutions, rather than trade-offs and compromises.

In the subsequent discussion, there was general agreement that there was a need for proposals to be put on the table in a transparent way prior to the Review Conference. It was also agreed that it was important to be ambitious as well as realistic. It was also recognized that there was not much time and that it was important to prepare concrete proposals that offered sensible and practical proposals for strengthening the

Convention. The importance of building the BWC community was recognised – it was important to enhance networking and interactions amongst BWC States Parties and stakeholders, to recognise good practices that had worked in other fora and with other bodies, as well as looking at cross-process efforts such as the BWC and the OPCW.

**Session 9** continued with further consideration of the same topic as Session 8, namely *Objectives and outcomes of the Seventh Review Conference II*. It began with a presentation on *Reviewing the Confidence-Building Measure process* by Riccarda Torriani of Switzerland. She began by noting that there had been a series of workshop in 2009 – 2010 to consider the existing CBM process, and they had identified a number of ways to improve the existing CBMs and had also examined some alternatives that might be considered in the longer term. She emphasised that the existing CBMs are politically binding and are **not** voluntary. The workshops had considered both the participation in the CBMs, the content of the CBMs, and the procedures associated with the CBMs. She noted that it was not always evident where to go within a country to find the information needed to be submitted in the CBMs. She felt that it was important to be ambitious at the Review Conference and to agree improvements to the existing CBMs then. There could also be a decision for further consideration to be given to the CBMs in the longer term.

The session continued with a presentation entitled *Institutional support for the BWC: the future of the ISU* made by Camilo García López-Trigo of Cuba. He pointed out that the ISU had been created by the Sixth Review Conference to provide administrative support to the meetings agreed by the Conference, as well as comprehensive implementation and universalization of the Convention and the exchange of confidence-building measures. He went on to say that the ISU had played a positive role in fulfilling its mandate by: (i) providing administrative support to and preparing documentation for meetings agreed by the Review Conference; (ii) facilitating communication among States Parties and, upon request, with international organizations; (iii) facilitating, upon request, States Parties' contacts with scientific and academic institutions, as well as non-governmental organizations; (iv) serving as a focal point for submission of information by and to States Parties related to the Convention; and (v) supporting, as appropriate, the implementation by the States Parties of the decisions and recommendations of the Review Conference. He also took note of the good work done by the ISU in regard to the CBM process and to the reports submitted by the ISU to the annual meetings of States Parties. He said it had clearly been a good decision to create the ISU at the Sixth Review Conference. However, there is still much that needs to be done. He then went on to elaborate some of the ideas that have been proposed for the implementation of Article X and the enhancement of assistance amongst States Parties, and to suggest that this could be carried out by the ISU. He noted that this was something that the States Parties needed to consider in preparing for the Review Conference and in considering the mandate and resources for the ISU.

In the subsequent discussion, it was noted that there is general support and praise for what the ISU has achieved and a recognition that consideration needs to be given not

only to continuing the ISU but also its strengthening and expansion. There was also broad support for the CBMs and a recognition that more needs to be done to improve national participation. There was clear support for improving the existing CBMs as well as, in the longer term, taking a fresh look at what CBMs are intended to achieve and how best this might be accomplished. It was noted that there are some specific proposals on the Think Zone, such as a paper by Filippa Lentzoz that argues for enhancing the CBM regime, and another paper by Nicholas Sims which suggests that information in the CBMs along with the States Parties' reports on compliance could be part of an accountability framework.

**Session 10** was the final session entitled *Summary and Conclusions*. The organizers of the workshop – China, Canada and the ISU – are to be complemented for the way in which they produced a *Co-chairs' summary of the workshop* which was available for all participants to take away from Beijing thereby maintaining the momentum of the workshop. The same paper was subsequently made available as a working paper submitted by China, Canada and the ISU at the December Meeting of States Parties: BWC/MSP/2010/WP.1 dated 1 December 2010 entitled *Co-chairs summary of the international workshop on "Strengthening international efforts to prevent the proliferation of biological weapons: The role of the Biological and Toxin Weapons Convention"*. This summary provides an excellent account of the workshop, and concludes by listing various specific proposals for consideration at the Seventh Review Conference that were put forward during the workshop:

- *To include national implementation: in a new action plan; in the next intersessional process; in the agendas of relevant international, regional and sub-regional organizations; and in building law enforcement capacity.*
- *To further elaborate the provisions of the BWC and develop specific procedures to strengthen the treaty regime.*
- *To build capacity to deal with disease, irrespective of cause.*
- *To enhance and improve mechanisms for information exchange, including on disease surveillance and disease situations as well as through the Confidence Building Measures.*
- *To improve specific efforts to strengthen education, outreach, awareness raising and codes of conduct amongst those involved with the life sciences.*
- *To strengthen Article X by defining precisely what is meant by cooperation and assistance, examining what assistance is currently available, and identifying gaps so that future assistance can be focused in these areas.*
- *To better integrate assistance and cooperation efforts into the CBM process and to consider a greater role for the ISU in acting as a clearing-house for Article X, including through establishing a database and providing reports to States Parties.*
- *To develop an action plan on universalization to strengthen efforts to expand the membership of the treaty.*
- *To establish a mechanism to sponsor participation in*



*BWC meetings.*

- *To agree to an intersessional process between the Seventh and Eighth Review Conferences and to enable it to take decisions on issues in which consensus exists.*
- *To develop CBMs in light of advances in the biological sciences and technology.*
- *To establish working groups to discuss specific issues, such as cooperation, science and technology*
- *To enhance the mapping of available resources, such as for export controls, etc. The ISU should further develop this activity.*
- *To consider the good practices of other entities, other processes and regimes.*

### **Reflections on the Government of China/ Government of Canada and ISU workshop**

This was an exceptionally timely workshop with its participation from 32 countries (Afghanistan, Algeria, Argentina, Australia, Brazil, Canada, Chile, China, Cuba, France, Germany, India, Indonesia, Iran, Japan, Jordan, Kyrgyzstan, Malaysia, Mexico, Morocco, Netherlands, Norway, Pakistan, Philippines, Republic of Korea, Romania, Russian Federation, Saudi Arabia, South Africa, Switzerland, Ukraine, United Kingdom and the United States) and nine organizations (European Union, InterAcademy Panel, International Federation of Biosafety Associations, Interpol, University of Bradford, United Nations Office for Disarmament Affairs, VERTIC, Wilton Park and the World Organisation for Animal Health (OIE)). It considered a wide range of topics relating to the Convention and the forthcoming Seventh Review Conference and showed that the States Parties participating in the workshop were already giving active consideration to proposals to strengthen the Convention that could be considered at the Seventh Review Conference.

The presentations and discussions were lively and frank. Issues were identified and attempts made to find ways forward that might attract consensus in 2011. It was widely recognised that ideas need to be developed **prior** to the Seventh Review Conference itself, and all were encouraged to develop and put forward such ideas making full use of any workshops or seminars between now and the Review Conference, as well as posting such ideas on the Think Zone for the Seventh Review Conference on the ISU website.

The workshop focused on many aspects of the Convention leading to the identification of various ideas, including the recognition of the importance of outreach and education of those engaged in the life sciences as part of any National Implementation action plan, the role of capacity building in regard to national implementation, to biosafety and biosecurity, and to preparedness for outbreaks of human, animal or plant disease.

It was also evident that the Annual Meetings might with advantage have the authority to take decisions on the matters

that the meetings have considered, and the time was approaching when a longer term consideration might usefully be given to some of the elements of the Convention. Thus, whilst there were improvements that should be made to the Confidence-Building Measure regime at the Seventh Review Conference, there is also a need for a working group to meet after the Review Conference to consider how the CBM regime might develop in the longer term including how best the regime could build confidence, and how to incorporate a clarification mechanism and also create an opportunity for the CBM submissions to be discussed.

There was discussion about the convergence of chemistry and biology and of what roles there could be for the BTWC and the CWC to work together more closely. In addition, the idea of a legally binding instrument, and of how best to build confidence in compliance, were discussed. One possible solution could be to set up a 2020 Vision working group that takes a look ahead to 2020 and what sort of treaty regime as a whole for the BTWC would be most appropriate for then – and hence how best the present regime might be developed to reach this future vision.

There was much discussion about Article X and whether there was an actual need for a mechanism for its implementation. It was, however, also evident that as there was already an immense amount of activity regarding international cooperation for the peaceful uses of the life sciences, it was not apparent that any mechanism would add value or be of relevance to the Convention. An integrated approach to capacity building in regard to national implementation, to biosafety and biosecurity, and to preparedness for outbreaks of human, animal or plant disease could be an effective solution.

Overall, there was an awareness that a cost-benefit analysis – or resource-benefit analysis – needs to be applied in considering the relative merits of the various options, so that the benefits to the Convention regime from each option can be considered in terms of the resources and efforts required from the States Parties.

Finally, Ambassador Paul van den IJssel's encouragement of ambition and realism in looking ahead to the Review Conference in 2011 is greatly to be welcomed. He very much encouraged all those engaged in the BWC community to develop and put forward in a transparent way their ideas for proposals that could strengthen the Convention regime early in 2011, so that all States Parties could consider these proposals and help to develop them in such a way as to be able reach agreement at the Review Conference itself.

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*This review was written by Graham S. Pearson, HSP  
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