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Editorial

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Avinash Anil Godbole

The 7th Review Conference of the Biological and Toxin Weapons Convention (BWC) was held at Geneva in December 2011. At this Conference, important developments in science and technology relating to the Convention were discussed with a point of view of strengthening the mechanisms for regulating, monitoring and preventing dual use technologies from falling into the hands of hostile elements. Even as technological advancement is important for betterment of knowledge, the diversity of actors makes it difficult as well as necessary to review safety and mechanisms at periodic intervals. This issue looks at the conclusions of the Review Conference.

B. M. Gandhi analyses the outcomes of this Review Conference and the documents submitted in the lead up to the Conference. Animesh Roul and Gunjan Singh analyse the recent instances of biological weapon use and threat, respectively in Afghanistan and Pakistan, highlighting the situation in the South Asian region. Based on a joint RUSI and ORF study, Rajeswari Pillai Rajagopalan throws light on India's vulnerabilities to the CBR materials. In the Country Profile section, Arun Vishwanathan analyses the CWC verification process in context of the discoveries of previously undeclared chemical weapons' stockpiles in Libya.

This issue also features other regular features like Chemical and Biological News and Book Review. In addition the issue also carries the Final Declaration of the 7th BTWC Rev Con.

With our readers' feedback, we wish to publish issues in the future that focus on a subject of particular concern.

Contributions and feedback are welcome and can be addressed to: editorcbw@gmail.com

CBR Security: India's Threats and Vulnerabilities

Dr. Rajeswari Pillai Rajagopalan

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Summary

With an expansive and expanding network of educational institutions, laboratories and private industrial facilities as also the trend towards privatisation of existing functions, India has to be mindful of the considerable weakness in the current frameworks of material facility and expertise control.

Royal United Service Institute (RUSI; London) and Observer Research Foundation (ORF; New Delhi) recently completed a study titled "Chemical, Biological and Radiological Materials: An Analysis of Security Risks and Terrorist Threats to India," examining India's vulnerabilities to CBR materials. The first part of this study undertook a threat analysis from terrorists or insurgent groups within India while the second examined the current provisions for safety and security within industries using CBR materials including an overview of the approaches, legislations and institutional instruments that are currently implemented by the government of India and private industry. A third section also looked at the global best practices, drawing examples from within India as well as international governmental and industrial models. The study concluded with a set of recommendations in order to strengthen the levels of CBR security and safety, both at the government and industrial levels.

This study brings in a unique perspective gained particularly through field research wherein visits and interviews were conducted in Andhra Pradesh, Gujarat, Maharashtra, Tamil Nadu and Delhi. Interactions were held with police and security personnel, industry owners and officers (chemical, pharmaceutical and biological industries using CBR materials), industrial trade bodies and research institutes, regulatory authorities such as the Central and State Pollution Control Boards and responder agencies, including the NDMA and state fire services. The field visits for the study may not be comprehensive in the sense of geographic coverage across India. However, it gives a fair overview looked at through a few important parameters, including the size of CBR industries and

laboratories as well as states that combat different forms of insurgency or internal security threats, in order to better appreciate the role and thinking of police and other security agencies in these states. While it is difficult to generalise, certain trend lines that have appeared can be presumed to stand true in the larger context.

While most global databases do not show terrorist incidents in India that have involved the use of CBR materials, nonetheless there have been a few instances in which terrorists have used these materials or have been found in possession of these materials. These incidents did not gain wider public attention given that they did not cause large-scale losses to the public.

While state and central agencies are live to the threat of CBR attacks, the lack of focused attention in a few states (given that there are more dominant internal security challenges such as left-wing extremism in the case of Andhra Pradesh and the absence of a major catastrophic event) has the danger of generating complacency as such incidents demonstrate a certain level of intent on the part of the non-state actor. In India's safety-security discourse on CBR, safety essentially comes from the idea of predictability of the consequences if safety standards are not adhered to. This is due to the inherent hazardous nature of the material being used. The concept of security in the Indian context rests on the idea of incident based reaction. For instance, until such time the non-state actors started using ammonium nitrate as a base explosive in bomb blasts, access to this material remained unregulated. This reflects the threat perception within the state machinery. This line of thinking is undergoing change both within the industry and security fields. Industry, for instance, views safety and security as two sides of the same coin and considers that if safety measures are complied with, including issues

of theft, security is automatically taken care of. This changed perception is beginning to trickle down to the level of medium-scale industries. However, the same cannot be said true for the small-scale industries which tend to flout the rules and norms imposed by the government.

While the establishment of the National Disaster Management Authority (NDMA) has been a step in the right direction, by and large the government approach has been focused on post-incident response than prevention and mitigation. The current institutional and legal frameworks for post-incident response, especially when dealing with stolen material, have remained sensitised about the CBR threat only from a response outlook. This approach is driven by the fact that there has been no major catastrophic incident (Bhopal gas tragedy being an exception) and also the low number of large-scale incidents. Therefore, the approach has focused on safety involving incident response and cleanup as opposed to security and prevention.

With an expansive and expanding network of educational institutions, laboratories and private industrial facilities as also the trend towards privatisation of existing functions, India has to be mindful of the considerable weakness in the current frameworks of material facility and expertise control. Lack of an integrated approach in controlling and protecting these materials could pose serious challenges to India. Delhi's recent Cobalt 60 incident is a case in point.

The lack of a centralised database with updated information on incidents, intelligence or reports of CBR terrorist attacks, sabotage, material thefts, intentional misuse or illegal trading has been found to be a major lacuna in India's current approach. While criminal investigations proceed under existing laws, the review

mechanism of the regulatory framework remains weak. For instance, it was found during our field study, particularly while talking to small-scale industries that minor cases involving theft of small amounts of CBR materials have failed to capture the attention of the relevant security agencies.

While some of the Indian industries are examples of international best practices, with safety and security concerns effectively interwoven, it was found that there exists a huge gap between large and small-scale industries, in terms of threat perception and the response measures undertaken thereafter. However, state and central agencies have to pay attention to the concerns of smaller manufacturers mainly the high level of spending on security, eroding the cost competitiveness in the market. Resource pooling may be a useful tool for clusters of small companies in order to employ good security companies while reducing the costs and maximising the impact of security spending.

Uneven levels of training and security provisions and lack of standardisation of the private security agencies in India is also a major lacuna. An accreditation and audit mechanism must be established for all agencies, involving an appropriate level of CBR threat awareness and reporting structure for audit findings to be signed off by a designated regulator. Insider threats are another set of issues that might go undetected under the current scenario given that there are no personnel reliability programmes that are being done at sensitive installations.

Even in worst-case scenarios, onsite protection of CBR materials receives greater attention as compared to offsite measures. Material transportation remains the weakest link in the CBR safety and security layout of India. While there is more control over

material which are imported into or exported from India, domestic transportation controls appear to be underdeveloped.

While the Central and State Pollution Control Boards have the most advanced and interconnected national environmental sampling structure within India, the limited mandate of the pollution control board is another major loophole. The Pollution Control Boards' mandate begins during production and ends with waste management and disposal; security of CBR materials is rarely considered to be under their jurisdiction.

While the creation and accomplishments of the NDMA is a way forward, the fact that the NDMA guidelines are not legally binding is a major weakness. Efforts must be made to make it mandatory for states to implement these guidelines. Lastly, while there are several laws and regulations that cover different aspects of CBR safety and security, the lack of an overarching CBR law has been a major oversight.

News Analysis: Chemical Substance Attacks in Afghan Schools

Mr. Animesh Roul

The author is Executive Director, Society of Study of Peace and Conflict.

Summary

In the two months of April and May (2012), over a hundred schoolgirls and teachers were affected by poisoned drinking water and contaminated air at these high schools. Periodic attacks against students, teachers and schools using various methods are in practice since the Taliban was ousted by the US led allied forces.

Afghan Taliban's campaign against female education and empowerment is well known. This campaign reached new heights when unidentified poison attacks occurred targeting several girls schools located in Kapisa and Parwan provinces in April-May 2009. These attacks involved poisonous chemical substances and the victims had complained of headaches, nausea, vomiting, itching in the eyes following exposure. Again, in mid 2010, incidents of poisoning came to light in the Afghan capital, Kabul including in Esmati High School. Similar incidents have been noticed in 2012 as well. During same months of this year the reported attacks have occurred in many girls high schools including the Naheed Shaheed Girls High School and Bashirabad High School in the Takhar province. In the two months of April and May, over a hundred schoolgirls and teachers were affected by poisoned drinking water and contaminated air at these high schools. Unidentified toxic powder was used to contaminate the air in the classrooms as well as the drinking water source of these schools.

Periodic attacks against students, teachers and schools using various methods are in practice since the Taliban was ousted by the US led allied forces. In the past, Islamic radicals resorted to acid attacks against women and girls who were seen either in market places or going to schools. Additionally, there are reports of schools being bombed or burned down. The former Taliban regime in Afghanistan had banned any form of female education terming it against Islamic practice. Now out of power, these elements have been trying to implement their writ in the areas located in North East of Kabul where they continue to maintain dominant positions and where insurgency draws support from the local Pashtuns. According to the Afghan ed-

ucation ministry, extremists associated with Taliban have forcibly close down more than 500 schools in 11 provinces in which it has strong support base.

The head of Takhar's public health department confirmed in a media report that the attacks are intentional acts aimed at poisoning schoolgirls. Even though the officials were silent, largely due to fears of retribution, fingers point to pro-Taliban elements that have always been opposing female education. Thus, this act seems to be aimed at spreading fear amongst the people of the localities. Authorities also believe that this could be a part of Taliban's annual 'spring-summer offensive'.

However, from a larger perspective, two things remained unclear so far and need proper investigations by authorities: the identification of substance used and the source of the chemical.

Zabiullah Mujahid, the known Taliban spokesman denied Taliban's role in the gas attacks against girl schools in the past. After the Esmati High School incident in Kabul in August 2010, Zabiullah Mujahid said: "We have not and will never take such action against innocent girls." Even in the aftermath of latest attacks, Taliban denied carrying out such attacks. Zabihullah Mujahid told the BBC News that the Taliban condemn such actions. He reiterated that the Mujahideen of the Islamic Emirate of Afghanistan (Taliban) are not involved in these alleged incidents. Meanwhile, Afghanistan's intelligence agency, the National Directorate for Security (NDS), has accused the Taliban group for poisoning and reportedly has apprehended some suspects having links with the Taliban. Investigating reporters active in the region also believed that the chemical gas attacks are very much unlikely and this could be part of some mass hysteria or a conspiracy to cripple the education system. Ac-

ording to NDS officials, one detained Taliban commander reportedly claimed responsibility behind the transportation of non-lethal chemical materials from the bordering regions of Pakistan and confirmed about a complicity of insiders who assisted the militants to transfer the Chemical material inside schools.

In the case of chemical substance attacks against schools, the intent seems not to kill any girl students but plausibly to deter their parents and students from attending schools. It could also be the case that as Taliban's core does not have full control of affiliated or local groups, it is possible that hardcore elements perpetrated those attacks or conspired with insiders to achieve their objective without the knowledge of senior leadership of Taliban.

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Perspective on Implications of the Advances in Life Sciences and Technologies Related to BTWC

Dr. B. M. Gandhi

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Summary

The document is collation of the information available from the 7th Review Conference of BWC held at the UN Office in Geneva from 5 to 22 December 2011. The Final Declaration at the Conference reaffirmed its conviction about the essentiality of the provisions of the obligations for international peace and security and to meet the goal of complete disarmament under strict and effective international control including the prohibition and elimination of all weapons of mass destruction repugnant to the safety of humankind.

There has been a growing concern over advances in scientific and technological innovations of concern to Biological and Toxin Weapons Convention (BTWC). This issue has been discussed at number of forums as prelude to the 7th Review Conference on BTWC and reviews have been undertaken for in-depth analysis of the underlying questions related to provisions of the BTWC on identifying the science and technology (S&T) innovations of concern to the Convention; elements of dual applications for hostile and benign purposes; what policies, regulations and governance the State Parties are going to adopt to respond to the issues at the national and international level; the ways the identified issues are going to be addressed under the Convention in coming years; and the ways continued review of advancements are going to be monitored with active participation of the scientific community and the State Parties. Reports submitted at the Seventh Review Conference held in Geneva in December, 2011 addressed some of these issues, which are highlighted below.

A report on the inter-sessional programme (2007–2010) by the Implementation Support Unit (ISU), working papers by India and other countries like Australia, Japan and New Zealand on significant developments S&T of relevance to the Convention and potential areas for future consideration were submitted to the Conference. A review of the provisions of the Convention, article by article, including the articles impacted by the developments in S&T is undertaken below.

The Final Declaration at the Conference reaffirmed its conviction about the essentiality of the provisions of the obligations for international peace and

security and to meet the goal of complete disarmament under strict and effective international control including the prohibition and elimination of all weapons of mass destruction repugnant to the safety of humankind.

The Conference reiterated its intent to invoke provisions of Article I and other related articles with special emphasis on developments in S&T and cooperation amongst the State Parties and the full and effective implementation of United Nations Security Council Resolution 1540 and other relevant United Nations resolutions against the terrorists acting for non-peaceful purposes.

Article I of the Convention covers all microbial or other biological agents or toxins in quantities that have no justification for prophylactic, protective or other peaceful purposes. Use by the States Parties of such agents, not consistent with prophylactic, protective or other peaceful purposes, for hostile purposes or in armed conflict, is considered a violation of the article. In this regard, experiments involving open air release of pathogens or toxins harmful to humans, animals and plants were considered inconsistent with the undertakings contained in Article. Since provisions of this article are applicable to all the scientific and technological developments in life sciences and in other relevant fields of science, in-depth analysis of developments in the field has been emphasised by a number of State Parties including India and accordingly inter-sessional discussions have been planned for the period 2012-2015. Specific subjects to be considered would include (a) advances in enabling technologies, including high-throughput systems for sequencing, synthesizing and analyzing DNA; bioinformatics and computational tools; and systems biology (2012), (b) advances in technologies for surveillance, detection,

diagnosis and mitigation of infectious diseases, and similar occurrences caused by toxins in humans, animals and plants (2013), (c) advances in the understanding of pathogenicity, virulence, toxicology, immunology and related issues (2014), and (d) advances in production, dispersal and delivery technologies of biological agents and toxins (2015). Each Meeting of Experts would come out with a factual report reflecting its deliberations.

The Conference reaffirmed the provisions of **Article III**, which comprehensively cover recipients at the international, national or sub-national levels and called for appropriate measures, including effective national export controls, by all States Parties to ensure that no direct and indirect transfers are made relevant to the Convention, to any recipient when the intended use is for purposes prohibited under the Convention. However, the States Parties were cautioned not to use the provisions of this Article to impose restrictions and/or limitations on transfers for purposes consistent with the objectives and provisions of the Convention of scientific knowledge, technology, equipment and materials under Article X.

The Conference called upon States Parties to adopt under **Article IV**, the constitutional processes, legislative, administrative, judicial and other measures, including penal legislation, designed to enhance domestic implementation of the provisions of Article I of the Convention, take appropriate action against the defaulters under international laws; and ensure measures of safety and security of microbial or other biological agents or toxins of pilferage in laboratories, facilities, and during transportation against unauthorized access. The importance of national implementation measures were emphasised under the national laws, including measures of biosafety and biosecurity, voluntary

management of standards on biosafety and biosecurity awareness among scientific community and professionals, voluntary development, adoption and promulgation of codes of conduct, enhanced capacity for surveillance and detection of outbreaks of disease at the national, regional and international levels to contain international spread of diseases.

The Conference reaffirmed full and comprehensive commitment to legal implementation of **Article X** to facilitate State Parties to have the right to participate in exchange of equipment, materials and scientific and technological information without hampering the economic and technological development of States Parties. The role of the private sector and UN bodies engaged in international cooperation was recognized to promote capacity building in the fields of vaccine and drug production, disease surveillance, detection, diagnosis, and containment of infectious diseases. Potential areas of cooperation include strengthening existing international organizations, networking on infectious diseases, epidemiology of disease outbreak, improved communication on disease surveillance, establishing and/or improving national and regional capabilities of surveillance, detection, diagnosis and combat of infectious diseases, development and production of vaccines and drugs, biological risk management and creating necessary infrastructure for the same. Public-private partnerships are considered to be effective measures of cooperation under the Article X. Conference agreed on the need of targeting and mobilizing resources, including financial resources, to facilitate maximum possible exchanges of equipment, material, scientific and technological information, specific needs and requirements and developing partnerships.

It is recognised that the Conference is aware of the fact that while scientific and technological developments in the field of biotechnology would increase the potential for cooperation among States Parties, they could also increase the potential for the misuse of both S&T.

The document submitted by the Implementation Support Unit highlighted significant developments in S&T at the inter-sessional programme (2007–2010) including enhancing international collaboration on enforcement of national legislations; measures to improve biosafety and biosecurity; adoption and/or development of codes of conduct; assistance and exchanges in biological sciences and technology, capacity building for disease surveillance, detection, diagnosis, and containment of infectious diseases and strengthening national biological risk management. Significant advances of S&T with beneficial and harmful impact highlighted included;

- 1. Significant recent developments with possible negative consequences:** Efforts to increase virulence of influenza viruses through reassortment of contemporary virus with pandemics strain; Increasing the transmissibility of influenza viruses through the reassortment of the H1N1 and H5N1 strains; computer simulation models on spread of disease that could also help optimise the impact of a deliberate release; Creation of a chimera virus from components from an influenza virus and the West Nile Virus; and identification and characterization of antibiotic resistance to new antibiotics.
- 2. Significant advances in S&T with potential for weapon applications:** Improved understanding of toxicity,

transmission, infectivity, virulence and pathogenicity in terms of mechanism of action of toxins, characterization of new toxins, transmission of agents, simulation models of transmission, expression of virulence factors, use of sequencing techniques to identify relevant proteins have potential negative consequences. Other advances that could be misused include enhanced efficacy of a biological weapon agent in terms of engineered RNA-base for programmed kill, altering host ranges that are capable of crossing the species barrier, efficient systems of delivering biological agents, avoiding host immune systems and evading detection, mechanisms that confer resistance to therapies, environmental stability and adoption of aerosol technologies by industry. All this leads to enhanced availability of complex bioactive compounds including through the use of bacterial chassis, development of synthetic ribosome and advances in biopharming circumventing existing control mechanisms causing security concerns under the provision of biosafety as scientists tend to work on parts, systems or information in minimal containment settings for pathogens that would usually require high-containment provisions. Also important are advances in understanding the role of neuroregulators in terms of their influence on psychological states and altered physical performance as well as linking neurobiology to disease.

3. Developments with possible beneficial consequences include:

a. Detection technologies that can provide new capabilities of early warning and response systems using satellite data, pre-clinical disease indicators, visual sensors for tracking

of pathogens and toxins and environmental detection of agents;

- b. Rapid diagnostics** enable faster, efficient and tailored response as it uses new approaches to differentiate between bacterial and viral infections. It also helps in genotyping pathogens and identifying reassortment events, in the identification of single particles of pathogens or toxins real-time diagnosis of fungal pathogens making broader use of mass spectrometry, advanced microscopy and sequencing technology. There have also been advances in developing faster assays for toxins.
- c. Prevention and prophylaxis** by use of broad spectrum vaccines as new approach in developing novel mechanisms to pre-empt disease, find ways to improve upon natural immune systems and improve delivery techniques for prophylaxis.
- d. Therapeutics:** Developments of novel antibiotic capabilities has led to creation of novel classes of antibiotics, identification of their characterization and has improved efficacy in identification of new targets. Therapeutics also helps in understanding how bacteria overcome antibiotics and identifying better discovery tools.
- e. Advanced antiviral therapy** includes development of a pan-viral drug, discovery of new drugs, improvement in understanding of host virus interaction, discovery of antiviral virus, virucidal proteins to disrupt viral adhesion to host cells and disrupt viral replication, and high-

affinity binding reagents to demonstrate antiviral activity.

f. Bioprospecting has led to identify potential therapeutic compounds. There are advances in dealing with toxins including through genetic manipulation of host mechanisms, nanoparticles to trap toxins, as well as antibody approaches to allow them to be flushed from the body; and

g. Response capacity: There have been advances in determining whether a disease event involves cultured rather than natural pathogens, using statistical approaches and microbial forensic capabilities. Research also demonstrated the importance of effective quarantine measures in limiting the impact and advanced decontamination technology, such as antibacterial foams using nanoparticles in a post-attack clean up.

4. Enabling advances and technologies include:

a. Characterizing biological systems and their networking: Advances in Genomics include understanding the role of Single Nucleotide Polymorphisms and copy number variation in disease, functional genomics, and evolvability of gene regulatory networks. Transcriptomics advances include identification of regulators, their characterization and the implications of network structure. Progress in proteomics includes better understanding of proteins synthesis, new tools for identification and quantification of proteins and determining their structure, standardization of data reporting and

enhancing understanding of protein-protein interactions. Metabolimics advances include comparative studies of pathways between species. Integrating data from these fields helps characterization in terms of mapping and modelling systems. Best example of combining different approaches was the characterization of *Mycoplasma pneumonia*.

b. Manipulating biological systems and networks: The two most significant advances were RNA interference technology (RNAi) and Zinc Finger Nucleases (ZFN);

c. Engineering biological systems and networks: Important advances here have been engineering of the metabolic pathway in yeast to produce the precursor of an anti-malarial drug, the creation of a synthetic mammalian gene circuit that revealed anti-tuberculosis compounds, a demonstration of distributed biological computation; and the engineering of an *E. coli* to sense and kill a human pathogen.

d. Advances in bioinformatics and computational biology: It has helped in gathering, processing and utility of biological data, including creation of new languages. It has helped in data mining, modelling and simulation, online tools and software for visualising complex biological information and analysing gene sequence data, protein analysis, as well as in designing tools. A computer controlled artificial intelligence can design a new round of experiments.

e. Converting biological information to digital data and back: Gene sequencing and gene

synthesis coupled with information technology can sequence cost effectively the bacterial genome in around two hours. Whole genome can be sequenced in a day. Also there has been significant progress in the ability to understand and use sequence data to produce longer strands of genetic material including combining short fragments into long sequences. Synthesis of genetic material has moved from viral settings, through bacterial settings, and mammalian organelles, to partial synthesis of a chromosome from a eukaryote; and

f. Generic enabling technologies:

Advances in technologies has made it easier, cheaper, faster and more reliable to do many of the basic procedures and practices involved in expanding the limits of our understanding and creating new applications and have allowed scientists to do things that were previously unattainable.

India Working Paper

The scope of Article I covers S&T developments relevant to the Convention. Article XII provides for five-yearly review of new scientific and technological developments relevant to the Convention. Article X facilitates cooperation for exchanges of scientific and technological knowledge, training of personnel, transfer of materials and equipments. The working paper submitted by India proposed to hold systematic and structured review of S&T developments within the framework of the Convention at the annual Meetings of Experts and Meetings of State Parties with maximum participation of industry, academia and the scientific community. The suggested reviews could include new scientific and technological developments

with special relevance to disease surveillance, diagnosis and treatment of pandemics, identification of developments with potentials of misuse and particular concern with respect to bioterrorism with emerging risks in dual use research, voluntary Codes of Conduct inter alia for scientists, academia and industry, S&T developments of particular benefit to developing countries, developments in other multilateral organizations such as WHO, OIE, FAO and IPPC and communication strategies about risks and benefits of life sciences.

An international workshop, Trends in Science and Technology Relevant to the Biological Weapons Convention was held October 31–November 3, 2010 at the Institute of Biophysics of the Chinese Academy of Sciences in Beijing. This workshop was planned by an international committee appointed by the National Research Council (NRC) of the National Academy of Sciences and convened in cooperation with IAP—the Global Network of Science Academies, the International Union of Biochemistry and Molecular Biology (IUBMB), the International Union of Microbiological Societies (IUMS), and the Chinese Academy of Sciences. The report prepared by IAP, the Global Network of Science Academies, was submitted to the 7th Review Conference by ISU as an independent contribution by International Scientific Community.

The meeting discussed issues related to life sciences and related fields including pace of scientific and technological developments, diffusion and its applications, beyond traditional research institutions and the extent to which additional scientific and technical disciplines beyond biology are increasingly involved in life sciences research. It addressed the issues of challenges, monitoring and better management.

The developments in S&T were considered in terms whether scientific developments yield new or novel types of agents or materials that are not captured under the scope of Article I, adequacy of national implementation measures (Article IV), the capabilities to carry out investigations of the alleged use of biological weapons (Article VI) and the design of international cooperation to ensure the benefits of peaceful applications of biology (Article X). The workshop discussed ways in which the BTWC and its States Parties could continue to follow trends in S&T including potential mechanisms for more systematic engagement with the scientific community.

Significant observations were made on advances in S&T related to Convention. Some of the observations are:

- a. Increase in the overall understanding of biological systems, its complexity and related challenges remain significant barriers and this complexity is likely to remain a defining feature of the biological sciences for the foreseeable future.
- b. The continuing as well as rapid diffusion of research capacity and knowledge makes the commitments of States Parties in Article III to restrict access to knowledge, materials, and technologies for anything other than purposes permitted by the Convention more challenging.
- c. Diffusion is seen as positive and beneficial as continuing attention to monitoring and assessing would anticipate any potential negative consequences and to strengthen the capacity of States Parties to address them. Examples are global disease surveillance and developing scientific capacity in microbial forensics.
- d. Some trained researchers take advantage of commercial kits and services and second hand equipment, to build their own laboratories and conduct experiments. In others less trained practitioners perform experiments without having the detailed biological or mechanistic understanding. Both these groups foster cultures of safety, security, and ethics. It however, underscores the need to understand how training and know-how are propagated and cultures of safety are developed in such non-institutional environments.
- e. Integration of life sciences with other disciplines may pose challenges and require further policy discussions to the operation of regimes like the BTWC and the Chemical Weapons Convention (CWC). The assessment of their implications will need to draw on expertise from a range of disciplines.
- f. The international scientific community can play a useful role in tracking trends and developments in S&T across diverse fields and contribute to a better appreciation of both the drivers and the roadblocks that broadly affect how S&T actually develops. Tracking and analyzing the impact of these forces should also be considered areas of potential interest for future monitoring of S&T trends.
- g. An area for future in-depth analysis suggested is the changing nature of tacit knowledge, as kits and other resources make it easier for less-skilled individuals to carry out work that once required significant training. This is facilitated by availability of web-based technologies through the creation of worldwide formal or informal learning communities or partnerships.

- h. International scientific organizations are considered potential resource for gaining access to a wide range of expertise to assist in understanding the “state of the science” and in assessing its implications.

The following are the observations of the group:

It is generally agreed that the advancements in S&T are within the scope of Article I. However, there could be new developments or surprise discoveries, for which continued monitoring and evaluation is important of advances in the life sciences relevant to BWC.

Beyond the question of whether these trends pose fundamental challenges to the scope of the treaty, every major article of the treaty will be affected by the developments surveyed. The trends may pose challenges to the implementation of some aspects, but they also offer important opportunities to support the operation of the convention.

The increase in pace, diffusion and convergence of S&T will continue for the foreseeable future. However, an in depth analysis and understanding of the factors including commercial interests responsible for driving the progress and technical roadblocks that impede it would provide a meaningful picture of how and when continuing S&T developments are likely to affect the convention.

Scientific community would play a major role in monitoring and assessment of trends in S&T and their implications for the BTWC. Intercessional discussions and other resources would feed information to the Review Conference, which would have to debate on ways and means of utilising the advice and analysis.

The advances in S&T have obvious implications for the BTWC with regard to the measures States Parties need to take to implement the provisions of the Convention and to prevent the use of biological or toxin agents for hostile purposes.

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2011 Libyan Disclosures: 'Take-away' for CWC verification

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Summary

As part of the process of joining the CWC in January 2004, Tripoli made a declaration to the Organisation for the Prohibition of Chemical Weapons (OPCW) wherein it declared the following materials and capabilities, which were verified by OPCW inspections. However, on November 1, 2011, the transitional Libyan government declared a hidden stockpile of chemical weapons.

Introduction

Libya and chemical weapons have a long history going back to the 1930s when the Italian dictator Benito Mussolini authorised the use of sulphur mustard gas against Libyan rebels. The decision led to the use of 24 mustard gas bombs on an oasis that was controlled by the Libyan rebels.¹

After decades as a pariah state, Libya was brought in from the cold following the December 19, 2003 statement where the former Libyan dictator, the late Colonel Qaddafi declared that it would dismantle its weapons of mass destruction (WMD) programmes and open the country to immediate and comprehensive verification inspections. This announcement followed many months of secret negotiations that began with a Libyan offer to the British officials in March 2003 to give up its WMD programmes.² As part of this process, Libya pledged to eliminate its nuclear and chemical weapons programmes subject to the International Atomic Energy Agency (IAEA) and Chemical Weapons Convention (CWC) verification.³

As part of the process of joining the CWC in January 2004, Tripoli made a declaration to the Organisation for the Prohibition of Chemical Weapons (OPCW) wherein it declared the following materials and capabilities, which were verified by OPCW inspections. These included 24.7 metric tonnes (MT) of sulphur mustard; 1,390 MT of precursor chemicals; 3,563 unloaded chemical weapons munitions (aerial bombs) and 3 former chemical weapons production facilities.⁴

A complex interplay of various factors influenced the Libyan decision. This ranged

from economic burden imposed by three decades of economic sanctions that had limited oil exports to a great extent. This in turn resulted in the drying up of new foreign investment which made giving up the WMD programmes so much more enticing. This was buttressed by the fact that Tripoli's efforts at procuring nuclear and biological weapons were not making much headway though it did possess a 'moderately capable' chemical weapons arsenal.⁵ Therefore, in the cost-benefit analysis, the Libyan leadership did not see much merit in continuing its WMD programmes.

Between 2004 and February 2011, Libya destroyed 51% of its sulphur mustard stockpile and 40% of its precursor chemicals under OPCW verification. It also irreversibly destroyed one of the three former chemical weapons production facilities by razing it to the ground and converted the other two into pharmaceutical plants after approval by the Executive Council of the OPCW.⁶ Destruction of the sulphur mustard started in October 2011. However, it was stopped in February 2011 due to breakdown of the heating unit in the disposal station.⁷ The situation has not been remedied as a result of the NATO-led operations in Libya that began in March 2011 when the OPCW inspectors left Tripoli.

November 2011 disclosures

However, on November 1, 2011, the transitional Libyan government declared a "previously undeclared chemical weapons stockpile".⁸ This was confirmed by the British PM David Cameron at the Lord Mayors Banquet where he stated, "In the last few days, we have learnt that the new Libyan authorities have found chemical weapons that were kept hidden from the world."⁹ Reports indicated that chemical weapons were stored at two previously undeclared sites in violation of the 2003 agreement that the former Libyan dictator

had reached with the international community. This declaration by the new Libyan government brought to light several hundred munitions loaded with sulphur mustard, few hundred kilograms of sulphur mustard stored in plastic containers and a limited number of unfilled plastic containers (munitions components). The total amount of sulphur mustard declared by Libya stands now at 26.3 metric tonnes.

Following the declaration, the OPCW dispatched its inspectors to Libya. Contrary to fears about possible use of chemical weapons by the Qaddafi regime against rebels, the inspectors did not find any diversion of the undestroyed sulphur mustard and precursors.¹⁰ On November 28, 2011, the new Libyan authorities officially submitted a declaration of these materials to the OPCW.¹¹ This was confirmed by the OPCW Director-General Ahmet Üzümcü at the opening of the week-long annual conference of the parties to the Chemical Weapons Convention (CWC) at in the Hague.¹²

Subsequently, another team of OPCW inspectors visited Libya during January 17-19, 2012 to verify the previously undisclosed chemical weapons. The purpose of the inspection as stated by the OPCW was two-fold; to "verify the new declaration in terms of types and quantities of chemical weapons, and to assist the Libyan authorities in determining whether another set of discovered materials is declarable under the provisions of the Chemical Weapons Convention".¹³

The inspectors found that all the newly declared materials were stored at the Ruwagha depot along with quantities of sulphur mustard and precursor chemicals that were declared by the Qaddafi government in 2004. In addition, at the request of the Libyan authorities the OPWC

inspectors examined munitions mainly in form of artillery shells which they determined were chemical munitions and hence declarable.¹⁴

Current CWC Verification Regime

The CWC is the fastest growing regime amongst the various arms control treaties. The CWC which entered into force in April 1997 currently has 188 members. Israel and Myanmar have not ratified the Chemical Weapons Convention; whereas Angola, Egypt, North Korea, Somalia, South Sudan, Syria are amongst the handful of countries that have neither signed nor acceded to the CWC.¹⁵

Such success is possible as a result of the fact that the CWC is seen as a non-discriminatory as well as a serious attempt at combining arms control and disarmament measures. The non-discriminatory nature of the CWC can be gauged from the fact that it treats all member states equally regardless of whether they possess chemical weapons or not. This is in complete variance with the division of the nuclear 'haves' in form of the five nuclear weapon states (NWS) and the remaining 'have nots' as the non-nuclear weapon states (NNWS). Secondly, the CWC does not grant any special rights to any individual state parties. Nor does it have any conditions for entry into force like the CTBT's Article XIV and Annex II which India and other countries view with great discomfort and suspicion.¹⁶

The second feature as stated by Michael Bothe is the 'system of compliance control' or the verification system that by its comprehensiveness has established the standard. Bothe correctly points out that the arms control verification systems designed under the BWC Verification Protocol and the CTBT owe much to the CWC system.¹⁷

In light of the Libyan case, it is important to re-look at the existing CWC verification regime and analyse the reason as to why it was possible for the Qaddafi regime to keep the materials disclosed from the OPCW. This becomes more intriguing because of the fact that the OPCW inspectors were regularly present in Libya since 2004 towards achieving the goal of destroying the declared chemical weapons stockpile.

The CWC establishes verification systems to four different obligations, namely the obligation to destroy chemical weapons in possession of a country; destroy old or abandoned chemical weapons; destroy or convert chemical weapons production facilities; ensure that toxic chemicals and their precursors are used only for purposes not prohibited by the Convention, i.e. are not diverted to weapons purposes. As Bothe points out, the first three of these are disarmament obligations whereas the fourth obligation is an arms control obligation.¹⁸

One issue that the Libyan case brings forth is that of National Implementation. Although, having universal membership (or near universal in CWC's case) is important, what is equally important is for states to implement the treaty's requirements in letter and spirit. Having a state like Libya as member of the CWC is of little use if it is not adhering to its obligations under the treaty and is not fully disclosing its chemical weapons stockpile/arsenal.

Under the CWC a 'well organised and transparent' system of national implementation, as Sergey Batsanov describes it, reinforces the compliance mechanism. To this end, as Batsanov states, the OPCW has been "...providing assistance to Member States with national implementation, including the preparation and adoption of domestic legislation and

administrative regulations and setting up functional national authorities".¹⁹ However, the CWC has to carefully walk the very thin line between assistance and impinging on a state's sovereign right to make laws. It is important to dwell on this point further, as verification involves a fundamental conflict of interest between the state's interests to not be subjected to intrusive verification and safety of commercial and industrial secrets. On the other hand, the verification system must be able to detect any non-compliance.

Conclusion

There are four types of routine inspections under the CWC, all of which are based on national declarations. The national declarations (Article III), detailing the locations and quantities of chemical weapons and production facilities, thus form the starting point of the verification process. Under the Verification Annex, which is the most voluminous sections of the CWC, states are obliged to declare all facilities where specific chemicals are handled in specific quantities. These are the sites where routine inspections are conducted.

However, the inherent problem in such a method is that the only way to check whether all the relevant sites are declared by a state is through challenge inspections. Interestingly, there has never been an instance where an *ad hoc* (challenge) inspection has been carried out under the CWC. In a case like the Libyan one, ascertaining the completeness of the declaration becomes critical. Currently, under the CWC, the OPCW selects the sites to be inspected either by comprehensive on-site inspection of all sites, random selection or selection based on qualitative thresholds etc.²⁰ Thus, on-site inspections form a key element in establishing the completeness and correctness of the national declarations made

by state parties. It is as a result of the above that the CWC lays out in great detail the requirement relating to national declarations.²¹

It is crucial to ensure that the Technical Secretariat updates the approved inspection equipment list, of course, in consultation with Member States. Given that the CWC does not lay down a procedure or a mechanism to achieve this, it has proved difficult to achieve an agreement among State Parties on the need to update the approved inspection equipment list.²² The need for the inspectors to be armed with the latest equipment becomes much more important when they are dealing with a state like Libya. However, not all problems with verifying the contents at a particular site are equipment related. In many cases, the analyses techniques used like radiography, using portable X-ray equipment, ultrasonic pulse echo have their own particular advantages and disadvantages. It is therefore a continuing challenge to identify the stored munitions with a high degree of confidence at the least expense of resources.

The Libyan case points to the necessity to take remedial measures to strengthen the OPCW's ability to check the veracity of the national declarations made by states. This becomes doubly important in cases such as Libya. Central in this regard is the continuous training of the organisation's inspectorate, which has faced problems as a result of financial and other constraints. Simultaneously, updating of the approved inspection equipments and working to develop newer, safer and more cost-effective ways to establish the contents of a chemical weapon munition are needed to make the CWC more effective. The international community would stand in good stead if it remembers, former US President Ronald Regan's *mantra*, "Trust, but Verify." This

holds the key to a stronger CWC and ensuring that the regime does not have to bear the brunt of any more surprises.

Endnotes:

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Anthrax Threat in Pakistan, Global Context and Regional Consequences

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Summary

Reports of Anthrax threat to Pakistani officials raises important questions regarding its spread in South Asia. It also exposes Pakistan's vulnerabilities to bioterrorism and calls for urgent attention at appropriate levels.

Anthrax has come into focus yet again with a letter received by a high profile office. According to media reports, Pakistani Prime Minister Yousaf Raza Gilani received a postal package containing anthrax spores in February 2012. While this incidence is confirmed by various sources, its exact date remains unclear as there are a number of contradicting reports with respect to the time when this happened. Some media reports claim that this incident happened about four months ago while others have been stating that this happened over a year ago. As reported by the New York Times, "The package was intercepted by the prime minister's security staff in October, according to the spokesman, Akram Shaheedi. The Pakistan Council of Scientific and Industrial Research, a government laboratory, established that the suspicious white powder it contained was anthrax spores, he said".¹ A criminal case was also reported to be filed and it was announced that this package was sent by a professor, Ms. Zulekha, of the Jamshoro University.²

Anthrax had become an important security threat in 2001 in the aftermath of 9/11. Reports show that letters containing Anthrax were sent to various people and resulted in five deaths and seventeen were reported sick.³ It is also generally believed that these attacks were carried out by some American scientists.⁴ There were similar attempts in India as well when the then Deputy Chief Minister of Maharashtra, Mr. Chhagan Bhujbal, received an envelope containing some white powder. It was later confirmed that the envelope contained Anthrax.⁵

There seems to be a pattern to these events as anthrax has been used as a major tool of distraction rather than as a Weapon of Mass Destruction (WMD). However in the past,

there have been reports which suggest that Anthrax has been one of the favoured weapons of Al Qaeda. There are reports which suggest that it had gained Anthrax as early as 1997.⁶

Another important question which arises after this is whether biological weapons have become the tool of choice for the disgruntled and discontent sections of the society. There is also a pattern whereby terrorist organisations and disgruntled individuals learn from each other as far as weapon usage is concerned. This is more prominent in the case of biological and chemical weapons. In the case of Anthrax one sees that more and more disgruntled people are using it. The first such case was when discontent scientists used it in the United States in 2001.⁷

After that in 2011 Anders Behring Breivik had also stated that he regarded Anthrax as '*one of the most effective weapons*'. Therefore, the potential are non-state actor users of anthrax, who see its utility for violent purposes, need not be terrorist organisations as such as such instances indicate. On the other hand, they could belong to any sections of the society reacting to any trigger causing disturbance. Thus, monitoring such individual actors becomes that much more difficult than observing an organised group.

The event appears to be more disturbing as Pakistan has always been considered a fertile ground for terrorism breeding. In the last two years there has been a steady increase in the number of terrorist activities inside Pakistan. What is surprising is that the Pakistani security establishment took almost four months to establish and acknowledge this fact. Delay in releasing these reports highlights the fact that the Pakistani government and security establishment are not fully equipped with detection and prevention techniques. This also raises questions about

Pakistan's capability to handle a full scale disaster arising out of biological attack. On the other hand in case of India, during the Mayapuri nuclear radiation case, government had proper institutions and process in order to handle the situation. The National Disaster Management Authority (NDMA) had successfully managed to control the situation and clear the affected area. The second issue which needs attention is the degree of Pakistani investment in the area of biological agents/weapons protection and safety in case of a disaster. It is always been in the domain of argument as to how strong is the Pakistani state's capability to prevent an accident/incident from spiraling out of control. This incident becomes even more worrying when seen in the light of other recent anthrax attacks reported in the last six months in neighbouring Afghanistan. Pakistan's weak institutional structures would stand even more exposed if these attacks were related to each other in any ways at all.

These developments show that the Pakistani terrorist organisations can get access to biological weapons. There is a need to understand and study the possibility of the outcome of such a scenario. As has been argued by Animesh Raul, "More than state actors, biological weapons are most dangerous when acquired, developed or used by non-state actors like terrorists, religious cults, and Mafia syndicates".⁸

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Chemical and Biological News

ARMS CONTROL

Foreign Minister of Azerbaijan Visits the OPCW

11 June 2012

The Minister of Foreign Affairs of the Republic of Azerbaijan, H.E Mr Elmar Mammadyarov, visited the OPCW Technical Secretariat in The Hague today for a meeting with Director-General Ahmet Üzümcü and other senior staff.

The Director-General commended Azerbaijan for its support to the OPCW and updated the Foreign Minister on its activities. He highlighted the preparations which are now underway for the Third Review Conference in April 2013 and stressed the importance of broad participation by States Parties in that process. Foreign Minister Mammadyarov reaffirmed Azerbaijan's continuing commitment and support to the OPCW and assured the Director-General of its willingness to help ensure a successful outcome for the Conference.

<http://www.opcw.org/news/article/foreign-minister-of-azerbaijan-visits-the-opcw/>

U.S. Watching Syrian Chemical Arms Amid Fear of Attack, Diversion: By Rachel Oswald

December 5, 2011

WASHINGTON — The United States is quietly but closely monitoring the status of Syria's large chemical weapons stockpile amid fears the regime of autocratic ruler Bashar Assad could use the warfare agents to quell continued political protests or divert

the materials to extremist groups that operate in the region.

Government officials in Washington declined to discuss specifics of the monitoring operation or what intelligence resources were involved, citing the need to maintain secrecy about operational tactics. They acknowledged, though, that there is a great deal of concern in Washington over Syria's chemical arsenal.

"It is extremely important that we maintain visibility on Syria's chemical weapons and it is something that we as an intelligence community" are actively involved in doing, a U.S. intelligence official told *Global Security Newswire*.

A joint U.S.-Israeli surveillance campaign in Syria was first reported by the *Wall Street Journal* in late August. Since that time "it hasn't diminished in importance at all," according to another U.S. official.

Both officials spoke on condition of anonymity due to the sensitivities surrounding the intelligence operation.

The United States is believed to have prepared contingency plans for dealing with Syria's toxic arsenal should it appear the regime is about to use the weapons or pass them to affiliated extremist organizations such as Hezbollah.

Syria is not a member of the Chemical Weapons Convention. It has also never publicly declared to the international community its chemical arsenal, which is understood to comprise hundreds of tons of nerve and blister agents, its doctrine for using such weapons or their exact capabilities. Still, Damascus' status as a chemical weapons possessor is widely accepted as fact.

The Middle Eastern state is not known to have ever used those materials, which date back to the 1970s, according to information compiled by the James Martin Center for Nonproliferation Studies. Until now Damascus is believed by most analysts to have developed them as a deterrent to outside attack, namely from Israel, and not for use against its own people.

The Assad regime, though, has earned a reputation for brutality toward its own people. More than 4,000 Syrians have been killed in the political uprising that began this past spring, according to the United Nations. The rising body count has U.S. officials and analysts concerned that if the Syrian leadership feels besieged and without other options, it could revise its calculus on the use of chemical weapons against Syrian army defectors and protesters.

In the event that violence in the country escalates into a full-blown civil war, there would likely be an effort by opposition forces to gain control of the regime's chemical weapon sites. A civil war would also likely increase the prospects of Assad ordering the use of his chemical armaments, according to Leonard Spector, deputy director of the James Martin Center.

"We are aware of the situation in Syria and continue to follow the events as they unfold," Pentagon spokeswoman Lt. Col. April Cunningham, said in a prepared statement. "The potential use of chemical weapons by any state poses a security threat to international security."

The chemical weapons surveillance campaign in Syria is not the only such effort the United States has been involved with this year. When Libyan civilians rose up in February against dictator Muammar Qadhafi's decades-long rule, U.S. intelligence and defense officials used a variety of assets to

keep tabs on the nation's small stockpile of declared mustard blister agent.

The United States worked with NATO and Libyan opposition forces to establish a team of specialists that watched over Libya's known chemical weapon facilities to deter government forces from seeking to use or divert chemical warfare materials, according to an Agence France-Presse report. Undeclared sites have also been identified as the Qadhafi regime was ousted.

The State Department also said it used "national technical means" to monitor Libya's chemical sites. National technical means are typically understood to encompass reconnaissance aircraft and satellites.

Obama administration officials would not disclose whether such technology is also being used to monitor Syria's chemical-weapon sites on the grounds that revealing such details could jeopardize the integrity of the operation. Unlike in Libya, NATO and the United States have no internationally sanctioned mandate for military operations in Syria, nor do they have the relationships with Syrian opposition groups similar to those established with the Libyan rebels.

Syria's chemical weapons program is considerably larger than Libya's, which would presumably make monitoring it more of a challenge.

"This is a full-blown chemical weapons program not the remnants" of one as in Libya, Spector said. "You have large inventories ... there are a lot of people milling around the sites," presumably guarding them and managing day-to-day operations.

Syria's chemical weapons program is understood to be comprised of four production facilities at al-Safira, Hama, Homs

and Latakia, along with two munitions storage sites at Khan Abu Shamat and Furqlus. Additionally, there is a chemical weapons research laboratory near Damascus, according to Michelle Dover of the James Martin Center.

“You’re also looking at a program that is almost completely self-sufficient from the research and production through the storage and weaponization,” said Dover, citing open source information dating back to the 1980s.

The Assad regime is thought to possess between 100 and 200 Scud missiles carrying warheads loaded with sarin nerve agent. The government is also believed to have several hundred tons of sarin agent and mustard gas stockpiled that could be used in air-dropped bombs and artillery shells, according to information compiled by the James Martin Center.

“We do not have any information that suggests there have been changes to the security of Syria’s chemical weapons stockpile,” a State Department official said in an e-mail to GSN. “Syria is a country of significant proliferation concern, so we monitor its chemical weapons activities very closely. We will continue to work closely with like-minded countries to limit proliferation to Syria’s chemical weapons program. We believe Syria’s chemical weapons stockpile, composed of nerve agents and mustard gas, remains under Syrian government control.”

Damascus is a well-known backer of Hamas and Palestinian Islamic Jihad, which both base their headquarters in the Syrian capital. Syria is also a supporter of Hezbollah and last year was accused by Israel of providing Scud ballistic missiles to the Lebanese militant group.

Noting reporting on contingency plans prepared by the Pentagon for military

operations to prevent militants from obtaining Pakistani nuclear weapons, Spector said it was reasonable to extrapolate that preparations have also been made to respond to crisis situations involving Syria’s chemical arms.

Such events might include the Assad regime preparing its chemical arsenal for an air attack on protesters and army defectors or the weakening of security around the chemical sites. The details of presumed action plans are a closely held secret.

“It would seem illogical to think that Pentagon has not brainstormed contingency plans,” Spector said.

Spector said he believes the United States has “definitely” issued backdoor diplomatic threats to Damascus of serious consequences should Assad order chemical weapon attacks on opposition activists. “I’m sure that message has been conveyed.”

Though Washington is concerned about the potential chemical weapons threat, it is not the Obama administration’s primary focus in dealing with Syria, according to the issue expert. “I think they have still more urgent items that are constantly on top of the agenda” such as persuading the Arab League to pass sanctions against the regime and pushing for Assad to step down, he said.

A key factor in U.S. contingency thinking is thought to be what actions Israel could unilaterally take if it feels a chemical weapons attack or proliferation is imminent, Spector said.

Israel in June 2007 mounted a sneak aerial attack on a Syrian site at Dair Alzour that it suspected housed an unfinished atomic reactor with military applications (see *GSN*, March 31, 2008).

A crucial element of any potential Israeli calculus on striking against Syria's chemical assets would be identifying the exact location of the weapons, Spector said.

"You have a lot of sites [in Syria] and not all of them may be known and you really have to do a lot of work, you really have to get everything," Spector said.

Also likely weighing on Israeli and U.S. thinking is whether an attack on Syria's chemical arsenal could backfire by pushing opposition forces to rally around Damascus in response to a foreign attack, Spector said. "You don't want to create an environment where the country rallies around the government because they face an external attack."

The Israeli Embassy in Washington did not respond to requests for comment by press time.

Source: <http://www.nti.org/gsn/article/us-watching-syrian-chemical-arms-amid-fear-attack-diversion/>

DISARMAMENT

Course on Emergency Medical Assistance for Victims of Chemical Incidents Held in Ukraine

May 24, 2012

The OPCW and Government of Ukraine jointly organised a course on emergency medical assistance for the victims of chemical incidents or attacks, including chemical-warfare agents, in Kyiv from 7 to 11 May 2012. Eighteen Russian-speaking experts from 14 States Parties* took part in the course, which related to Article X of the Chemical Weapons Convention and was held at the Ukrainian Scientific and Practical Centre of Emergency Medical and Disaster Medicine.

The course targeted professionals and managers in the field of medical countermeasures to emergencies involving chemical warfare agents and other toxic chemicals. The agenda included theoretical lectures and practical exercises, with intensive discussion of issues related to national and international responses and medical countermeasures to a chemical attack during a mass gathering event.

A complex field exercise focused on mitigating the consequences of a chemical attack was conducted on the final day of the course with more than 200 representatives of different Ukrainian emergency response units participating. The exercise covered all stages from the first response in the incident area to hospital treatment of the victims.

*Armenia, Belarus, China, Estonia, Hungary, Kazakhstan, Lithuania, Poland, Serbia, Russia, Uzbekistan, Vietnam, Yemen and USA (as a lecturer).

<http://www.opcw.org/news/article/course-on-emergency-medical-assistance-for-victims-of-chemical-incidents-held-in-ukraine/>

Advance Assistance-and-Protection Course Held in China

May 24, 2012

The OPCW and Government of the People's Republic of China jointly organised an Advanced Assistance-and-Protection Course from 14 to 18 May 2012 at the Institute of Chemical Defence of the People's Liberation Army in Beijing. Experts from 19 States Parties* took part in the course, which related to Article X of the Chemical Weapons Convention.

The course participants belonged to national emergency-response agencies involved in dealing with chemical-related incidents. The

course provided advanced training in the use of chemical protective equipment and in techniques of monitoring, detection and decontamination in response to attacks with chemical warfare agents, supplemented with table-top and field exercises.

Mr Leslie Gumbi, the OPCW Director of International Cooperation and Assistance, addressed the opening session of the course and held bilateral meetings with representatives of the Foreign Affairs and Defence ministries.

* Belarus, Burundi, Cote d'Ivoire, India, Jamaica, Jordan, Kenya, Madagascar, Malaysia, Mongolia, Mexico, Pakistan, Peru, Uganda, Uruguay, Vietnam, Yemen, Zambia and Zimbabwe.

<http://www.opcw.org/news/article/advance-assistance-and-protection-course-held-in-china/>

OPCW Inspects 1000th OCPF Plant Site

March 15, 2012

OPCW inspectors have now inspected 1,000 different sites around the world of "Other Chemical Production Facilities" (OCPFs) as they are classed under Article VI of the Chemical Weapons Convention. The 1000th site inspection was conducted at an industrial plant in France.

OCPFs do not produce any of the three Schedules of chemicals listed in the Convention. They are subject to inspection because the configuration and complexity of their production processes enables them potentially to be converted for the manufacture of chemical weapons or related materials. Of the nearly 5,000 chemical plants sites globally that are inspectable by the OPCW, about 85% are currently OCPFs.

Recognizing their importance to the Convention, the most recent Conference of the States Parties in December approved a plan to scale up the OPCW's annual number of industrial inspections from 209 in 2011, to 241 in 2014. All of the additional inspections will be OCPFs.

"This milestone is yet another demonstration of the shared commitment of the OPCW, its States Parties and the global chemical industry to ensuring that chemistry is only used for peaceful purposes," said OPCW Director-General Ahmet Üzümcü. "By increasing the number of OCPF inspections in the coming years, we will improve our capacity to verify compliance with the provisions of the Chemical Weapons Convention and thereby raise the level of confidence among all our stakeholders."

Toxic chemicals are used for a variety of peaceful purposes from making ink to producing pharmaceuticals. To allow for verification, States Parties declare legitimate activities involving scheduled chemicals (chemicals that have been used as warfare agents or to make such agents in the past). The OPCW verifies such declarations through a combination of data monitoring and on-site inspections without "undue intrusion into the State Party's chemical activities".

<http://www.opcw.org/news/article/opcw-inspects-1000th-ocpf-plant-site/>

OPCW Inspectors Verify Newly Declared Chemical Weapons Materials in Libya

January 20, 2012

A team of OPCW inspectors visited Libya from 17 to 19 January 2012 to verify previously undisclosed chemical weapons that were discovered after the fall of the

former regime. The new government in Tripoli announced the discovery last year and submitted a formal declaration of the weapons to the OPCW on 28 November.

The two-fold purpose of this inspection was to verify the new declaration in terms of types and quantities of chemical weapons, and to assist Libyan authorities in determining whether another set of discovered materials is declarable under the provisions of the Chemical Weapons Convention. The mission was carried out with the logistical support of the Federal Republic of Germany and the UN Department of Safety and Security, and with the full cooperation of Libyan authorities.

The OPCW inspectors verified the declared chemical weapons, which consist of sulfur mustard agent that is not loaded into munitions. At the same time, at the request of the Libyan authorities the inspectors examined munitions, mainly artillery shells, which they determined are chemical munitions and hence declarable.

All of the newly declared materials are stored at the Ruwagha depot in southeastern Libya, together with quantities of sulfur mustard and precursor chemicals that were declared by the Qaddafi government when Libya joined the OPCW in early 2004. The Qaddafi government succeeded in destroying 54% of its declared sulfur mustard and about 40% of the precursor chemicals before operations had to be suspended in February 2011 when the destruction facility malfunctioned.

Libya must now submit a detailed plan and completion date for destroying all of the declared materials to the OPCW not later than 29 April 2012, the date of the final extended deadline.

<http://www.opcw.org/news/article/opcw-inspectors-verify-newly-declared-chemical-weapons-materials-in-libya/>

NATIONAL AND INTERNATIONAL DEVELOPMENTS

10th Regional Meeting of African National Authorities Held at African Union Complex in Ethiopia

June 01, 2012

The African Union and the OPCW co-hosted the 10th Regional Meeting of National Authorities of States Parties to the Chemical Weapons Convention in Africa at the new African Union Conference Complex in Addis Ababa, Ethiopia from 22 to 24 May 2012. The meeting was attended by 42 participants from 36 OPCW States Parties* together with permanent representatives and sub-regional institutions accredited to the African Union.

The opening ceremony featured an array of speakers including Mr El Ghassim Wane, AU Director for Peace and Security; Mr Leslie Gumbi, Director of the OPCW's International Cooperation and Assistance Division; and Brigadier General Dr Charles Norbert Muzanila, Director at Tanzania's Ministry of Defence and National Service and Chairperson of the Tanzanian National Authority.

The meeting was officially opened by Honourable Tadesse Haile, State Minister for Industry and Chairman of Ethiopia's National Authority, who delivered the keynote speech.

"Besides the priority given by OPCW to Africa in supporting and fostering international cooperation in areas of peaceful uses of chemistry, the (OPCW) is also delivering significant capacity building support in the region in areas of national implementation of the Convention," the Honourable Tadesse Haile stated. "The concerted efforts of the Organisation to respond to Africa's needs in this regard, is highly commendable."

The 3-day meeting is an annual event that provides an opportunity for National Authorities to confer, network and share experiences, as well as consult with the Technical Secretariat of the OPCW on how best they can fulfil their obligations and receive the required assistance. It also serves as a forum for States Parties in the region to indicate which forms of assistance they can offer to other States Parties.

* Algeria, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Chad, Comoros, Republic of the Congo, Democratic Republic of Congo, Djibouti, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Libya, Malawi, Mauritius, Mozambique, Namibia, Niger, Nigeria, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

<http://www.opcw.org/news/article/10th-regional-meeting-of-african-national-authorities-held-at-african-union-complex-in-ethiopia/>

Director-General Addresses Final Chemical Weapons Demilitarisation Conference in Scotland

May 22, 2012

OPCW Director-General Ahmet Üzümcü visited Glasgow on 21 and 22 May 2012 where he attended the 15th and final international Chemical Weapons Demilitarisation (CWD) Conference, hosted by the UK's Defence Science and Technology Laboratory (Dstl).

The CWD conferences have been held annually around the world since 1998. This year's final event marked the passing of the 29 April 2012 deadline for possessors of chemical weapons to eliminate their

stockpiles, and celebrated the global progress in chemical weapons destruction. The conference attracted more than 170 delegates from 16 countries and featured more than 90 prominent speakers, including the UK Minister of State for Armed Forces, Mr Nick Harvey.

Discussions in the conference included a long-term review of the progress made by national CWD programmes, focusing on successes, lessons learned and an exchange of best practices. Participants also looked at explosive detonation technology - given that many countries' plans are now to acquire such equipment - as well as at chemical safety and security, recovery of chemical weapons from rivers and seas, and innovative technologies.

In his address to the conference, Director-General Üzümcü reported that nearly three-quarters of all declared chemical weapons have now been destroyed under OPCW verification since entry into force of the Chemical Weapons Convention in 1997. Although this fell short of the final extended deadline, he said the decision of the States Parties on this issue fully preserved the integrity of the Convention and that the three concerned possessor states have submitted detailed plans to the OPCW for destroying their remaining arsenals, together with planned completion dates. In the specific case of Libya, he stated that a number of States Parties have considered providing assistance to enable the government to destroy its remaining stockpile, and that Canada has provided a large sum for this purpose under the Global Partnership Program.

The Director-General also reported that of the 70 former chemical weapons production facilities (CWPFs) that have been declared in total by 13 States Parties, 43 have been

irreversibly destroyed and 21 converted for purposes not prohibited under the Convention. He added that all converted production facilities remain under systematic verification by the OPCW for a 10-year period following conversion to ensure they are fully consistent with the approved conversion requests.

<http://www.opcw.org/news/article/director-general-addresses-final-chemical-weapons-demilitarisation-conference-in-scotland/>

Canada Provides OPCW its Largest-Ever Donation to Expedite Destruction of Chemical Weapons in Libya

April 24, 2012

Canada has made a voluntary contribution to the OPCW of CAD 6 million (Euro 4.53 million) for the Organisation to support the Libyan Government's efforts in resuming and completing the destruction of its remaining stockpile of chemical weapons.

Canadian Foreign Minister John Baird first announced the offer of assistance in Tripoli last October, when he visited the city shortly before the end of the eight-month conflict which resulted in the fall of the Qadhafi regime. The donation is the largest the OPCW has ever received from a State Party since it was established in 1997.

"This historic donation reflects the spirit of solidarity and mutual aid that has exemplified the OPCW from its beginning, and which is vital to achieve our goal of ridding the world of all chemical weapons," said the OPCW Director-General, Ambassador Ahmet Üzümcü. "I commend the Government of Canada for its generous

support, and we look forward to working closely with Libya to eliminate the last of its chemical weapons as soon as possible."

The Libyan authorities, in turn, highly appreciate the support provided by the Government of Canada to Libya in order to achieve its comprehensive programme for the disposal of chemical weapons.

OPCW will use the funds for three main activities: 1) Project management and training of personnel to operate the destruction facility, 2) purchase of equipment and related materials for destroying sulfur mustard agent and chemical weapons munitions stored at the Ruwagha depot, and 3) provision of support services for OPCW on-site inspectors at Ruwagha.

The OPCW will continuously maintain rotating teams of 5-6 inspectors at Ruwagha throughout the destruction process, which OPCW officials expect should be completed for Libya's Category 1 chemical weapons within 6 months after operations resume.

Libya is one of three States Parties, together with the Russian Federation and the United States, that are unable to meet the 29 April 2012 final extended deadline set by the Chemical Weapons Convention for completing the destruction of their declared chemical arsenals. By decision of the Conference of States Parties in December, the three countries must submit detailed destruction plans to the OPCW, with completion dates, by no later than the final extended deadline, and are subject to enhanced reporting and verification measures.

<http://www.opcw.org/news/article/canada-provides-opcw-its-largest-ever-donation-to-expedite-destruction-of-chemical-weapons-in-libya/>

Fears grow for fate of Syria's chemical weapons: by Jonathan Marcus

There are growing concerns - shared both in neighbouring countries and among key western governments - about the security of these weapons should the regime fall.

There are even persistent reports in the US that preparations are being made to secure such stocks in the event of a regime meltdown.

One aspect of the problem is the scale and scope of Syria's chemical weapons programme.

Leonard Spector, executive director of the James Martin Center for Nonproliferation Studies based in Washington, notes that: "Syria has one of the world's largest chemical weapon arsenals, including traditional chemical agents, such as mustard, and more modern nerve agents, such as Sarin, and possibly persistent nerve agents, such as VX.

"Syria is thought to have a number of major chemical weapon complexes, some in areas of current conflict, such as the Homs and Hama regions. The bases are said to be guarded by elite forces, but whether they would stay at their posts if the Assad regime collapses cannot be predicted."

"Conceivably, the Assad government could use some of these agents against rebel forces or even civilians in an effort to intimidate them into submission" Leonard Spector James Martin Center for Nonproliferation Studies

An additional concern is the manner in which the different kinds of chemical weapons are stored.

Mr Spector notes that while the mustard agent is believed to be stored in bulk form,

rather than in individual munitions, other agents are thought to be in "binary" munitions, in which two innocuous solutions combine when the munition is fired to create the chemical warfare agent.

These might be more easily transported and used than the bulk agent.

Mr Spector adds: "US officials believe Syria's chemical arms are stored in secure bunkers at a limited number of sites and have not been dispersed into the field."

Beyond the intelligence services there is little hard and fast detail on Syria's chemical weapons programme.

Unlike Libya, which had signed the Chemical Weapons Convention and was in the process of dismantling its stocks when Muammar Gaddafi's regime collapsed, Syria has not joined the convention and thus has never made any formal declarations of its stocks.

Indeed as Charles Blair, a Senior Fellow at the Federation of American Scientists underlines, Libya is not a terribly useful precedent when considering the potential problems surrounding Syria's chemical arsenal.

Libya's arsenal was much smaller; stocks of mustard agent were essentially old; locations of stockpiles were known and the Libyan authorities were co-operating in their destruction.

Crucially too, says Mr Blair, there are huge differences in the two countries' potential abilities to deliver chemical weapons.

"Libya was able to deliver its sole CW agent via aerial bombs only - a militarily ineffective manner in this case," he says.

"Syria, by comparison, is thought to possess a variety of platforms for chemical weapons

delivery - an open-source CIA report lists aerial bombs, artillery shells and ballistic missiles.”

There is considerable discussion as to the nature of the threat Syria’s weapons pose.

Leonard Spector says that there are multiple dangers.

“Conceivably, the Assad government could use some of these agents against rebel forces or even civilians in an effort to intimidate them into submission,” he says.

“Or insurgents could overrun one of the chemical weapon sites and threaten to use some of these weapons, in extremis, if threatened with overwhelming force by the Syrian army.”

The scenario that is causing the greatest concern, he says, is the possible loss of control over Syria’s chemical arsenal leading to the transfer of chemical weapons to Hezbollah, in Southern Lebanon, or to al-Qaeda.

Special forces

Components of both organisations are now operating in Syria as one of the groups challenging the Assad regime, he says.

Such a link-up between al-Qaeda-affiliated groups and weapons of mass destruction has haunted US military planners for more than a decade.

In the face of such concerns there has been considerable pressure, not least from Washington, for the US to come up with plans to secure the Syrian weapons in the event of the collapse of the regime.

There has been a succession of press reports displaying various degrees of bravado suggesting US Special Forces are being

readied to swoop in and take over Syria’s chemical weapons infrastructure.

The reality is more complex. Such a mission would require significant numbers of “boots on the ground” in highly volatile circumstances.

As Charles Blair makes clear: “The Iraq experience demonstrates the difficulty of securing highly sensitive military storage facilities.”

He argues that in Syria the challenges are likely to be greater “because no foreign army stands poised to enter the country to locate and secure chemical weapons manufacturing and storage facilities”.

Of course, as Leonard Spector points out, details of US contingency planning are not known.

“The most desirable plan would be to urge the weapons’ current custodians to remain in place during any transition of power, and to place the sites under the supervision of an international contingent that could monitor the weapons’ security, as decisions were made about how to manage or destroy them in the future,” he says.

However, he adds: “For the US to attempt to secure the sites in the face of armed resistance by Syrian forces would be extremely demanding, given the number of the sites involved and their considerable size.”

Of course if the Assad regime were to go, a whole new set of issues emerges.

Would any new Syrian government agree to join the convention and agree to eliminate its chemical weapons stocks?

Or, as Leonard Spector notes, would they instead “insist on retaining them as a counter

to Israel's nuclear capabilities and as a bargaining chip in future negotiations with Israel over the Golan Heights?"

Source: <http://www.bbc.co.uk/news/world-middle-east-18483788>

Police probe anthrax sent to Pakistan PM: by Sajjad Tarakzai

Pakistani police said they were investigating how and why an envelope containing anthrax was sent to the prime minister's office in the capital Islamabad last year.

It appeared to be the first reported case of anthrax sent to the government in Pakistan, a nuclear-armed country of 174 million that is battling a Taliban insurgency and where Al-Qaeda chief Osama bin Laden was shot dead.

It was not immediately clear how toxic was the substance included in the package addressed to Prime Minister Yousuf Raza Gilani, who was responsible or how they could have accessed anthrax of any quality in Pakistan.

The case was registered on Tuesday, but according to the police report and a senior government official, the envelope was received last October.

"After the laboratory test confirmed that the parcel contained anthrax we registered a case against unknown people," police officer Hakim Khan said.

The senior government official said the Pakistan Council of Scientific and Industrial Research confirmed the package was "anthrax-infected" but offered no explanation for why it took months to register a case with police.

The police report, registered on Tuesday and seen by AFP, said an envelope addressed to

Gilani contained a smaller envelope with an unidentified "powder/chemical". It was received by his office on October 18.

Police refused to let AFP see the accompanying laboratory test results.

Khan said the parcel was posted from the Jamshoro district in southern province Sindh, the capital of which is Karachi — Pakistan's biggest city used by the United States to ship supplies to troops fighting in Afghanistan.

"We have sent a police team to investigate it and to find the culprits there," he told AFP.

But in Jamshoro, 180 kilometres (113 miles) northeast of Karachi, police said they had not been informed by Islamabad of any anthrax delivery, instead finding out through local media reports.

"We have not yet received any instructions from the government to investigate this matter," local police official Bashir Ahmed told AFP.

"We have asked the local post office protectively to check their records to know about the sender.

"We can't say how long it will take to complete the investigation. We expect a quick result if the sender's identity is not fake."

In November 2001, police arrested two men suspected of sending a letter containing anthrax to Pakistan's largest newspaper, Jang.

In the United States, anthrax mailings rattled a jittery American public just days after the September 11, 2001 attacks that killed almost 3,000 people.

US government scientist Bruce Ivins committed suicide in July 2008 as FBI

agents were about to bring charges against him over the anthrax campaign, which killed five people and injured 17.

Source: <http://www.google.com/hostednews/afp/article/ALeqM5jKlkHBfhQGnuSnrT9nND52hTHJkg?docId=CNG.744bcb7e35508b7ab0945c9f1f64aa72.3a1>

The Taliban's unconventional tactics: the use of chlorine bleach

According to very recent reports from Afghanistan, the Taliban may have retaliated for the Koran burning against the US-run Bagram Air Field, by poisoning food at the military Torkham Forward Operation Base near the Pakistan border in the Nangarhar province. The actual situation is not completely clear, but NATO announced that traces of chlorine bleach were found in fruit and coffee delivered for consumption by military personnel, and the Taliban hastened to claim responsibility for that.

<http://www.ibconsultancy.eu/publications/cer-update/>

DEVELOPMENT IN SCIENCE AND TECHNOLOGY

Bio-security, an emerging challenge: by Bhaskar Balakrishnan

Freedom to research in biotechnology shouldn't be hampered, but the risks must be dealt with.

Advancements in biotechnology can be used to alarmingly destructive effect.

Recently, in September 2011, researchers in Rotterdam succeeded in modifying the avian flu virus in ferrets (the best animal model for influenza in humans) to make it capable of airborne transmission, and therefore, making it far more contagious.

The implications are that the highly-dangerous A(H5N1) avian flu virus, which so far spreads only from birds to humans, could get modified fairly easily, to enable it to spread by airborne transmission from human to human, making it far more dangerous. The A(H5N1) avian flu has caused around 350 deaths from 600 reported cases so far, giving it a mortality rate of around 60 per cent.

Advances in Biotech

Recent research indicates that developments in biotechnology have now made it quite feasible to modify a wide range of pathogens to give them new features, including those that can make them far more dangerous to humans. A number of new diseases have emerged in recent years, adding to the list of existing pathogens and toxins that are dangerous to humans.

In the recent case, the research journals concerned were asked by US agencies to not publish key details of their work on the precise nature of changes to the A(H5N1) virus, due to the apprehension that such information may be misused by unscrupulous elements. While the request has been acceded to, it has kicked off a debate in the scientific community on the general question of disclosure of certain research details in biosciences, which could be used by terrorists and some others against human populations, and the possible role of WHO in this regard.

The Biological Weapons Convention, 1972, which has 165 countries party to it, embodies the determination of the international community to ban biological and toxin weapons. Such weapons have, for long, been regarded as being relatively less effective for military use.

However, the convention is wanting in the area of verification. The US, which is the

global leader in biotechnology, has stalled progress in this area, due to concerns regarding leakage of scientific information. This may now change. However, while the convention applies to governments, it leaves open the possibility of non-state actors attempting to use bio-weapons.

Unlike nuclear weapons technology, biotechnology is relatively accessible and far less costly to use. For example, the cost of gene sequencing has dropped dramatically with technology advances. Biotech research can be done at a relatively low cost compared to nuclear technology. Harmful pathogens can be easily transported and released to cause disease and panic.

So, this technology offers non-state actors a potential low-cost, high-impact instrument to cause damage to human populations, or to the agricultural sector of target countries. The accidental release of dangerous pathogens from research facilities is another possibility.

Indeed, reports have already surfaced of Al Qaeda in the Arabian Peninsula (AQAP) seeking to produce a deadly toxin, Ricin, from the waste left after extracting castor oil. What if pathogens like avian flu A(H5N1), plague, SARS, etc. are deliberately modified to enable airborne transmission from humans to humans? This possibility can no longer be dismissed as science fiction.

Action is needed at the national and international levels to deal with this threat. Biotech research is conducted in a wide range of institutions, in government laboratories, universities, and by the private sector. Freedom to do research in biotechnology shouldn't be hampered, and intellectual property rights must be protected. However, the risks to society and the general population must be dealt with, as in the case of nuclear research.

This presents a formidable challenge to national regulatory agencies and governments in devising suitable frameworks to enhance bio-security and bio-safety, while allowing research to go ahead. Developing countries shouldn't face additional hurdles in access to biotechnology and its useful applications.

India should be actively engaged in international efforts and adopt national measures to strengthen bio-safety and bio-security. Otherwise, institutions and researchers in India are likely to face problems in entering into technology collaborations and research activities in biotechnology.

Regulatory Agency

India is still to set up a National Biotechnology Regulatory Agency, as a single professional entity to deal with all aspects of biotech research and applications.

A Bill on this subject, prepared in 2008, was finally tabled in Parliament in December 2011. This Bill needs to be revisited, to take into account the issue of bio-security and regulation of research activities, to prevent potentially dangerous information going into the wrong hands. This is a delicate issue, and needs to be dealt with in consultation with all stakeholders — research community, academics, and the private sector.

Research institutions should devote more attention to security aspects, such as personnel security, security of materials and equipment, and security of information and data. Suppliers of biotech equipment and consumables may need to take more care and verify end-user details while responding to requests for equipment and materials that could be used for harmful ends.

In the area of response to bio-threats, the actions needed are similar to those for combating disease outbreaks. Rapid response should include national and international coordination to instantly identify and determine the genetic makeup of the responsible pathogen, and evolve counter measures. The WHO's Global Outbreak and Response Network (GOARN) has functioned well and could be further strengthened.

On the international level, more teeth have to be given to the BWC. Verification provisions should be strengthened, and the role of national entities more precisely defined. A model code of conduct and rules for biotech institutions and national agencies could be useful. The Chemical Weapons Convention could provide a useful model in this regard. The threat from bioterrorism just got more likely than nuclear terrorism, and needs an effective response.

Source: <http://www.thehindubusinessline.com/opinion/article2834528.ece?homepage=true>

Dutch Scientist Agrees to Omit Published Details of Highly Contagious Bird Flu Findings: by Mikaela Conley

December 21, 2011

The virologist who created a potentially dangerous, mutant strain of the deadly bird flu virus has agreed to omit methodology details from his published reports on the new strain. The decision came after the U.S. government warned Tuesday that published details of the experiment could be used to create a biological warfare weapon.

Ron Fouchier of Erasmus Medical Center in Rotterdam, Netherlands, said he created the contagious form of the deadly H5N1 bird flu

strain "easily" by mutating a few genes within the strain. Officials feared the virus could kill millions if it were unleashed.

The study results were to be published in the U.S. journal *Science*, but in an unprecedented move, the National Science Advisory Board for Biosecurity, an independent committee that advises the U.S. Department of Health and Human Services and other federal agencies, recommended against full publication after it determined the risks outweighed the benefit.

"Due to the importance of the findings to the public health and research communities, the NSABB recommended that the general conclusions highlighting the novel outcome be published, but that the manuscripts not include the methodological and other details that could enable replication of the experiments by those who would seek to do harm," the committee said in a statement Tuesday.

"The researchers have reservations about this recommendation but will observe it," the Erasmus Medical Center said Wednesday in a statement.

Fouchier said that he hoped his research would assist in developing better vaccines and treatments for influenza in the future. He conducted his research on ferrets, whose immune response to influenza is similar to that of humans.

"We know which mutation to watch for in the case of an outbreak, and we can then stop the outbreak before it is too late," Fouchier said in a statement Tuesday on the medical center's website. "Furthermore, the finding will help in the timely development of vaccinations and medication."

The Erasmus Medical Center press office and the National Institutes of Health, which

funded the research, said in statements that the researchers are currently working on a new report that complies with the feds' recommendations before it is published in scientific journals.

Since it appeared in 1996, H5N1 has killed hundreds of millions of birds, but transmission to humans has been rare. There have been about 600 confirmed cases of infections in people, most who worked directly with poultry. While rare, it is a deadly human disease. About 60 percent of those who had confirmed cases of the virus died.

Up until now, experts believed that the strain was transmissible from person-to-person only through very close contact, but Fouchier mutated the strain, creating an airborne virus that could be easily transmitted through coughs and sneezes.

In a written statement, Science's editor-in-chief Bruce Alberts said that the journal was taking the NSABB's request for an abbreviated version of Fouchier's research "very seriously."

While Alberts said that the journal strongly supported the work of the NSABB, Alberts and the journal's editors have "concerns about withholding potentially important public-health information from responsible influenza researchers. Many scientists within the influenza community have a bona fide need to know the details of this research in order to protect the public, especially if they currently are working with related strains of the virus."

Experts contacted by ABCNews.com were split on whether the research should be published in full. While most virologists believe in noncensorship for the good of public health, some talked about the potential danger of releasing information on a virus that was so easily mutated.

"The idea that biosecurity consists in policing scientists or chimerical "bioterrorists" is dangerous nonsense," said Philip Alcabas, a professor in the CUNY School of Public Health at Hunter College. "Who knows what the motives of the self-professed biosecurity experts really are, but in practice, their ridiculous pronouncements promote vast expenditures of taxpayer monies that achieve little outside of propping up the very biosecurity industry from which the warnings come."

"Censorship offends me, particularly in science," said John Barry, author of "The Great Influenza." "Nonetheless, I think there should be review of something like this ... but not necessarily by the government. It should be done by people who respect scientific openness, and publishing should be the default position."

Others, including Nicole Baumgarth, a professor in the department of pathology, microbiology and immunology at the University of California at Davis, said NIH scientists were in an "excellent position" to review the science and make recommendations, and discussion of whether to publish such data was necessary.

"I do think [the research] might help us to identify which mutations in influenza might cause outbreaks," said Baumgarth. "This could be of importance as the NIH and other organizations supporting the screening and sequencing of influenza viruses from birds and other species, as a means to screen what might become the next pandemic."

At least one other laboratory in Japan has reportedly conducted similar research and found similar results. Because of this, Baumgarth said, "it is really important to report on the research progress made, but maybe withhold the details of the exact mutations. At least that would prevent copycat science."

“But let’s face it,” she said. “If two research labs have done this already, nobody is going to stop a third and fourth lab from doing the same. These are routine procedures done in many labs around the world.”

Dr. William Schaffner, chairman of preventive medicine at Vanderbilt School of Medicine, said Fouchier’s research is “illuminating” in helping to understand what aspects of the virus’s genome can be changed to make it easily transmissible. Instead of worrying about biological warfare, Schaffner said the greater danger was the potential for the virus to escape from the university research laboratory, where it is reportedly being held under lock and key.

“A biowarfare threat of influenza is very low because the virus cannot be controlled once it is let out into the community,” said Schaffner. “There are other biological warfare weapons that are much better at targeting specific populations. More importantly, people in that lab need to have a careful discussion on how to keep that virus in the lab secure. Viral escape is quite real. They should take extra care in handling it.”

Source: <http://abcnews.go.com/Health/dutch-scientist-agrees-omit-details-killer-bird-flu/story?id=15204649&page=2#.T8XMjrBzVOU>

Book Review

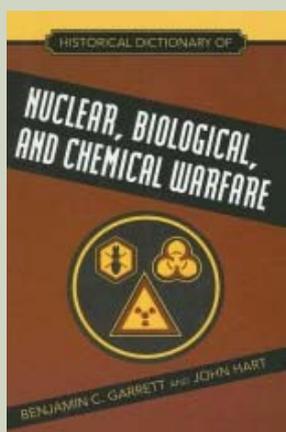
**Historical Dictionary
of Nuclear, Biological
and Chemical Warfare
(Benjamin C. Garrett
and John Hart, (2010)
Scarecrow Press Inc.
Maryland, USA. ISBN
0-8108-5484-8, Price
Rs. 995.00, pages
xxxvi + 261)**

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Summary

In an attempt to raise awareness about nuclear, biological and chemical weapons, this historical dictionary delineates their origins and main characteristics.



The knowledge and awareness of our society about Nuclear, Biological and Chemical (NBC) weapon systems are limited as compared to the conventional weapons systems. In an attempt to raise awareness about these weapons systems, this historical dictionary delineates various kinds of NBC weapon systems, their origins and main characteristics, basic facts and figures as well as the military uses of these weapons. In addition, this book attempts to demonstrate what has been done and also what remains to be done to control the spread of these weapons of mass destruction.

The introduction section presents an overview of the status of these weapons at present. Various milestones achieved in the process of creating as well as containing these weapons are listed chronologically. The list of acronyms and abbreviations supplements the dictionary very well.

In the beginning, Garrett and Hart admit that they have attempted to presents an overview of historical, legal, technical, and politics aspects of NBC weapons. While doing so, the book aims to strike a balance between various aspects of NBC weapons systems and their development such as important events, notable individuals, fundamental research, testing and fielding of these weapons systems etc. It also throws light upon behaviours and concerns of important individuals with reference to these weapons. This book will be helpful in enhancing the awareness about NBC weapons systems and would also help in clarifying its current status which would help in the future considerations regarding these weapons.

According to the authors, information provided in this dictionary is based on either unclassified primary or other authoritative

and reliable sources. They clarify that this dictionary does not contain any such information which are technically sensitive in nature. The authors note that generally states are capable of finding information required to assess NBC threats but individuals often cannot. If individuals are aware of the possible threats posed by these weapons systems, they would be in a position to assess the measures being taken to contain these threats. This book would be helpful in enhancing such awareness as well.

According to the authors, emergence of nuclear warfare is parallel to the development of nuclear physics. As the awareness about the fundamental nature of atom and its utility as vast energy source enhanced, general knowledge about nuclear weapons has improved. However, with regards to biological warfare, it is difficult to track the course and its modern use. They note that it is difficult to give direct credit to any particular scientist for developing biological weapons. Despite their large stockpiles in the US, erstwhile USSR and elsewhere, chemical weapons were not used in combat except during the Iran-Iraq war in 1980s. Thus, despite limited experience with these weapons systems, NBC warfare continues to fascinate states especially non-democratic regimes such as Iraq during Saddam Hussein regime, North Korea according to the authors.

Meanwhile, according to the authors, there have been repeated attempts to restrict or prohibit the development, stockpiling and the use of NBS weapons systems. These efforts have resulted in establishing Chemical Weapons Convention (CWC), Nuclear Non-proliferation Treaty (NPT), Biological and Toxin Weapons Convention (BTWC) etc. These multilateral instruments are aimed at controlling and prohibiting use of these NBC weapons systems. The book provides and explains various relevant technical and legal

terms regarding these conventions and treaties as well.

However, the book appears to be mainly relying on western sources which create a gap in this study which could be fulfilled by further research in later editions. Meanwhile, explaining this gap, authors have noted that western states have been most active in the field of NBC weapon systems and thus the most primary resources are based in these states. They admit that a great deal of research needs to be carried out using primary sources in Asia, Middle East, Latin America and Africa. This historical dictionary would certainly be an important reference book for scientists, researchers, policy makers as well as common readers interested in the subject of NBC weapons and warfare.

Final Declaration: 7th BTWC Rev Con

Final Declaration

The States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, which met in Geneva from 5 December to 22 December 2011 to review the operation of the Convention, solemnly declare:

- (i) Their conviction that the Convention is essential for international peace and security;
- (ii) Their determination also to act with a view to achieving effective progress towards general and complete disarmament under strict and effective international control including the prohibition and elimination of all weapons of mass destruction and their conviction that the prohibitions of the Convention will facilitate the achievement of this goal;
- (iii) Their reaffirmation of their understanding that the Convention forms a composite whole, as well as of their firm commitment to the purposes of the Preamble and all the provisions of the Convention;
- (iv) Their determination to comply with all their obligations undertaken pursuant to the Convention and their recognition that States Parties not in compliance with their Convention obligations pose fundamental challenges to the Convention's viability, as would the use of bacteriological (biological) and toxin weapons by anyone at any time;
- (v) Their continued determination, for the sake of humankind, to exclude completely the possibility of the use of bacteriological (biological) and toxin weapons, and their conviction that such use would be repugnant to the conscience of humankind;
- (vi) Their reaffirmation that under any circumstances the use, development, production and stockpiling of bacteriological (biological) and toxin weapons is effectively prohibited under Article I of the Convention;
- (vii) Their conviction that terrorism in all its forms and manifestations and whatever its motivation, is abhorrent and unacceptable to the international community, and that terrorists must be prevented from developing, producing, stockpiling, or otherwise acquiring or retaining, and using under any circumstances, biological agents and toxins, equipment, or means of delivery of agents or toxins, for non-peaceful purposes, and their recognition of the contribution of the full and effective implementation of United Nations Security Council Resolution 1540, United Nations General Assembly Resolution 60/288, and other relevant United Nations resolutions;
- (viii) Their reiteration that the effective contribution of the Convention to international peace and security will be enhanced through universal adherence to the Convention, and their call on signatories to ratify and other States, not party, to accede to the Convention without further delay;
- (ix) Their recognition that achieving the objectives of the Convention will be more effectively realised through greater public awareness of its contribution, and through collaboration

with relevant regional and international organizations, in keeping within their respective mandates, and their commitment to promote this;

- (x) Their recognition of their consideration of the issues identified in reviewing the operation of the Convention as provided for in Article XII, as well as their consensus on the follow-up actions contained herein.

Article I

1. The Conference reaffirms the importance of Article I, as it defines the scope of the Convention. The Conference declares that the Convention is comprehensive in its scope and that all naturally or artificially created or altered microbial and other biological agents and toxins, as well as their components, regardless of their origin and method of production and whether they affect humans, animals or plants, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes, are unequivocally covered by Article I.
2. The Conference reaffirms that Article I applies to all scientific and technological developments in the life sciences and in other fields of science relevant to the Convention and notes that the Conference has decided to include in the 2012-2015 intersessional programme a standing agenda item on review of developments in the field of science and technology related to the Convention.
3. The Conference reaffirms that the use by the States Parties, in any way and under any circumstances of microbial or other biological agents or toxins, that is not consistent with prophylactic, protective or other peaceful purposes,

is effectively a violation of Article I. The Conference reaffirms the undertaking in Article I never in any circumstances to develop, produce, stockpile or otherwise acquire or retain weapons, equipment, or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict in order to exclude completely and forever the possibility of their use. The Conference affirms the determination of States Parties to condemn any use of biological agents or toxins other than for peaceful purposes, by anyone at any time.

4. The Conference notes that experimentation involving open air release of pathogens or toxins harmful to humans, animals and plants that have no justification for prophylactic, protective or other peaceful purposes is inconsistent with the undertakings contained in Article I.

Article II

5. The Conference reaffirms for any state ratifying or acceding to the Convention, the destruction or diversion to peaceful purposes specified in Article II would be completed upon accession to, or upon ratification of, the Convention.
6. The Conference emphasises that states must take all necessary safety and security measures to protect human populations and the environment, including animals and plants, when carrying out such destruction and/or diversion. The Conference also stresses that these States Parties should provide appropriate information to all States Parties via the exchange of information (confidence-building measures form F).
7. The Conference welcomes statements made by States Parties, and newly

acceding and ratifying States Parties, that they do not possess agents, toxins, weapons, equipment or means of delivery as prohibited by Article I of the Convention.

Article III

8. The Conference reaffirms that Article III is sufficiently comprehensive to cover any recipient whatsoever at the international, national or sub-national levels.
9. The Conference calls for appropriate measures, including effective national export controls, by all States Parties to implement this Article, in order to ensure that direct and indirect transfers relevant to the Convention, to any recipient whatsoever, are authorized only when the intended use is for purposes not prohibited under the Convention.
10. The Conference reiterates that States Parties should not use the provisions of this Article to impose restrictions and/or limitations on transfers for purposes consistent with the objectives and provisions of the Convention of scientific knowledge, technology, equipment and materials under Article X.

Article IV

11. The Conference reaffirms the commitment of States Parties to take the necessary national measures under this Article. The Conference also reaffirms that the enactment and implementation of necessary national measures under this Article, in accordance with their constitutional processes, would strengthen the effectiveness of the Convention. In this context, the Conference calls upon States Parties to

adopt, in accordance with their constitutional processes, legislative, administrative, judicial and other measures, including penal legislation, designed to:

- (a) enhance domestic implementation of the Convention and ensure the prohibition and prevention of the development, production, stockpiling, acquisition or retention of the agents, toxins, weapons, equipment and means of delivery as specified in Article I of the Convention;
 - (b) apply within their territory, under their jurisdiction or under their control anywhere and apply, if constitutionally possible and in conformity with international law, to actions taken anywhere by natural or legal persons possessing their nationality;
 - (c) ensure the safety and security of microbial or other biological agents or toxins in laboratories, facilities, and during transportation, to prevent unauthorized access to and removal of such agents or toxins.
12. The Conference welcomes those measures taken by States Parties in this regard, and reiterates its call to any State Party that has not yet taken any necessary measures, to do so without delay. The Conference encourages States Parties to provide appropriate information on any such measures they have taken, as well as any other useful information on their implementation to the Implementation Support Unit within the United Nations Office for Disarmament Affairs.
 13. The Conference notes the value of national implementation measures, as appropriate, in accordance with the

constitutional process of each State Party, to:

- (a) implement voluntary management standards on biosafety and biosecurity;
- (b) encourage the consideration of development of appropriate arrangements to promote awareness among relevant professionals in the private and public sectors and throughout relevant scientific and administrative activities and;
- (c) promote amongst those working in the biological sciences awareness of the obligations of States Parties under the Convention, as well as relevant national legislation and guidelines;
- (d) promote the development of training and education programmes for those granted access to biological agents and toxins relevant to the Convention and for those with the knowledge or capacity to modify such agents and toxins;
- (e) encourage the promotion of a culture of responsibility amongst relevant national professionals and the voluntary development, adoption and promulgation of codes of conduct;
- (f) strengthen methods and capacities for surveillance and detection of outbreaks of disease at the national, regional and international levels, noting that the International Health Regulations (2005) are important for building capacity to prevent, protect against, control and respond to the international spread of disease;
- (g) prevent anyone from developing, producing, stockpiling, or otherwise acquiring or retaining, transporting or transferring and using under any

circumstances, biological agents and toxins, equipment, or their means of delivery for non-peaceful purposes.

14. In this regard, the Conference welcomes assistance related to Article IV already provided and encourages those States Parties, in a position to do so, to provide assistance, upon request, to other States Parties.
15. The Conference further encourages States Parties, that have not yet done so, in accordance with the recommendation of the Sixth Review Conference, to designate a national focal point for coordinating national implementation of the Convention and communicating with other States Parties and relevant international organizations.
16. The Conference reaffirms that under all circumstances the use of bacteriological (biological) and toxin weapons is effectively prohibited by the Convention.
17. The Conference recalls United Nations Security Council Resolution 1540 (2004) that places obligations on all states and is consistent with the provisions of the Convention. The Conference notes that Resolution 1540 affirms support for the multilateral treaties whose aim is to eliminate or prevent proliferation of nuclear, chemical or biological weapons and the importance for all States Parties to these treaties to implement them fully in order to promote international stability. The Conference also notes that information provided to the United Nations by states in accordance with Resolution 1540 may provide a useful resource for States Parties in fulfilling their obligations under this Article.

Article V

18. The Conference reaffirms that:

- (a) this article provides an appropriate framework for States Parties to consult and cooperate with one another to resolve any problem and to make any request for clarification, which may have arisen in relation to the objective of, or in the application of, the provisions of the Convention;
- (b) any State Party which identifies such a problem should, as a rule, use this framework to address and resolve it;
- (c) States Parties should provide a specific, timely response to any compliance concern alleging a breach of their obligations under the Convention.

19. The Conference reaffirms that the consultation procedures agreed at the Second and Third Review Conferences remain valid to be used by States Parties for consultation and cooperation pursuant to this Article. The Conference reaffirms that such consultation and cooperation may also be undertaken bilaterally and multilaterally, or through other appropriate international procedures within the framework of the United Nations and in accordance with its Charter.

20. The Conference takes note of initiatives from States Parties to promote confidencebuilding under the Convention.

21. The Conference stresses the need for all States Parties to deal effectively with compliance issues. In this connection, the States Parties agreed to provide a specific, timely response to any compliance concern alleging a breach of

their obligations under the Convention. Such responses should be submitted in accordance with the procedures agreed upon by the Second Review Conference and further developed by the Third Review Conference. The Conference reiterates its request that information on such efforts be provided to the Review Conferences.

22. The Conference emphasises the importance of the exchange of information among States Parties through the confidence-building measures (CBMs) agreed at the Second and Third Review Conferences. The Conference welcomes the exchange of information carried out under these measures and notes that this has contributed to enhancing transparency and building confidence.

23. The Conference recognises the urgent need to increase the number of States Parties participating in CBMs and calls upon all States Parties to participate annually. The Conference notes that since the Sixth Review Conference, there has only been a slight increase in the percentage of State Parties submitting their CBMs. The Conference emphasises the importance of increasing and continuing participation in the CBMs.

24. The Conference recognises the technical difficulties experienced by some States Parties in completing full and timely submissions. The Conference urges those States Parties, in a position to do so, to provide technical assistance and support, through training for instance, to those States Parties requesting it to assist them to complete their annual CBM submissions. The Conference notes the decision to update the CBM forms.

25. The Conference notes the desirability of making the CBMs more user-friendly and stresses the need to ensure that they provide relevant and appropriate information to States Parties.
26. The Conference recalls that the Third Review Conference agreed, “that the exchange of information and data, using the revised forms, be sent to the United Nations Department for Disarmament Affairs no later than 15 April on an annual basis”. The Conference reaffirms that the data submitted in the framework of the annual exchange of information should be provided to the Implementation Support Unit within the United Nations Office for Disarmament Affairs and promptly made available electronically by it to all States Parties according to the updated modalities and forms in Annex I. The Conference recalls that information supplied by a State Party must not be further circulated or made available without the express permission of that State Party. The Conference notes the fact that certain States Parties made the information they provide publicly available.

Article VI

27. The Conference notes that the provisions of this Article have not been invoked.
28. The Conference emphasizes the provision of Article VI that such a complaint should include all possible evidence confirming its validity. It stresses that, as in the case of the implementation of all the provisions and procedures set forth in the Convention, the procedures foreseen in Article VI should be implemented in good faith within the scope of the Convention.
29. The Conference invites the Security Council:
 - (a) to consider immediately any complaint lodged under this Article and to initiate any measures it considers necessary for the investigation of the complaint in accordance with the Charter;
 - (b) to request, if it deems necessary and in accordance with its Resolution 620 of 1988, the United Nations Secretary-General to investigate the allegation of use, using the technical guidelines and procedures contained in Annex I of United Nations Document A/44/561;
 - (c) to inform each State Party of the results of any investigation initiated under this Article and to consider promptly any appropriate further action which may be necessary.
30. The Conference reaffirms the agreement of States Parties to consult, at the request of any State Party, regarding allegations of use or threat of use of biological or toxin weapons. The Conference reaffirms the undertaking of each State Party to cooperate in carrying out any investigations which the Security Council initiates.
31. The Conference notes that the procedure outlined in this Article is without prejudice to the prerogative of the States Parties to consider jointly cases of alleged non-compliance with the provisions of the Convention and to make appropriate decisions in accordance with the Charter of the United Nations and applicable rules of international law.

Article VII

32. The Conference notes with satisfaction that these provisions have not been invoked.
33. The Conference takes note of desires expressed that, should a request for assistance be made, it be promptly considered and an appropriate response provided. In this context, in view of the humanitarian imperative, pending consideration of a decision by the Security Council, timely emergency assistance could be provided by States Parties, if requested.
34. The Conference recognises that States Parties bear the responsibility for providing assistance and coordinating with relevant organizations in the case of alleged use of biological or toxin weapons. The Conference reaffirms the undertaking made by each State Party to provide or support assistance in accordance with the Charter of the United Nations to any State Party which so requests, if the Security Council decides that such State Party has been exposed to danger as a result of a violation of the Convention.
35. The Conference takes note of the willingness of States Parties, where appropriate, to provide or support assistance to any State Party, which so requests, when that State Party has been exposed to danger or damage as a result of the use of bacteriological (biological) agents and toxins as weapons by anyone.
36. The Conference considers that in the event that this Article might be invoked, the United Nations could play a coordinating role in providing assistance, with the help of States

Parties, as well as the appropriate intergovernmental organizations, in accordance with their respective mandates, such as the World Health Organization (WHO), the World Organisation for Animal Health (OIE), the Food and Agriculture Organization of the United Nations (FAO), and the International Plant Protection Convention (IPPC). The Conference recognises the value of further dialogue regarding appropriate means of coordination between States Parties and relevant international organizations.

37. The Conference recognizes that there are challenges to developing effective measures for the provision of assistance and coordination with relevant international organizations to respond to the use of a biological or toxin weapon. The Conference underlines the importance of the coordination of the provision of appropriate assistance, including expertise, information, protection, detection, decontamination, prophylactic and medical and other equipment that could be required to assist the States Parties in the event that a State Party is exposed to danger as a result of a violation of the Convention. The Conference also takes note of the proposal that States Parties may need to discuss the detailed procedure for assistance in order to ensure that timely emergency assistance would be provided by States Parties, if requested, in the event of use of biological or toxin weapons.
38. The Conference notes that State Parties' national preparedness contributes to international capabilities for response, investigation and mitigation of outbreaks of disease, including those due to alleged use of biological or toxin weapons. The

Conference notes that there are differences among States Parties in terms of their level of development, national capabilities and resources, and that these differences affect national and international capacity to respond effectively to an alleged use of a biological or toxin weapon. The Conference encourages States Parties, in a position to do so, to assist other States Parties, upon request, to build relevant capacity.

39. The Conference notes the need for States Parties to work nationally, and jointly, as appropriate, to improve, in accordance with their respective circumstances, national laws and regulations, their own disease surveillance and detection capacities for identifying and confirming the cause of outbreaks and cooperating, upon request, to build the capacity of other States Parties. The Conference notes that the International Health Regulations (2005) are important for building capacity to prevent, protect against, control and respond to the international spread of disease; such aims are compatible with the objectives of the Convention.
40. On the provision of assistance and coordination with relevant organizations upon request by any State Party in the case of alleged use of biological or toxin weapons, States Parties recognize that in this regard health and security issues are interrelated at both the national and international levels. The Conference highlights the importance of pursuing initiatives in this area through effective cooperation and sustainable partnerships. The Conference notes the importance of ensuring that efforts undertaken are effective irrespective of whether a disease outbreak is naturally

occurring or deliberately caused, and cover diseases and toxins that could harm humans, animals, plants or the environment. The Conference also recognises that capabilities to detect, quickly and effectively respond to, and recover from, the alleged use of a biological or toxin weapon need to be in place before they are required.

Article VIII

41. The Conference appeals to all States Parties to the 1925 Geneva Protocol to fulfil their obligations assumed under that Protocol and urges all states not yet party to the Protocol to ratify or accede to it without further delay.
42. The Conference acknowledges that the 1925 Geneva Protocol, which prohibits the use in war of asphyxiating, poisonous or other gases, and of bacteriological methods of warfare, and the Convention complement each other. The Conference reaffirms that nothing contained in the Convention shall be interpreted as in any way limiting or detracting from the obligations assumed by any state under the 1925 Geneva Protocol.
43. The Conference stresses the importance of the withdrawal of all reservations to the 1925 Geneva Protocol related to the Convention.
44. The Conference recalls the actions which States Parties have taken to withdraw their reservations to the 1925 Geneva Protocol related to the Convention, and calls upon those States Parties that continue to maintain pertinent reservations to the 1925 Geneva Protocol to withdraw those reservations, and to notify the Depositary of the 1925 Geneva Protocol accordingly, without delay.

45. The Conference notes that reservations concerning retaliation, through the use of any of the objects prohibited by the Convention, even conditional, are totally incompatible with the absolute and universal prohibition of the development, production, stockpiling, acquisition and retention of bacteriological (biological) and toxin weapons, with the aim to exclude completely and forever the possibility of their use.
46. The Conference notes that the Secretary-General's investigation mechanism, set out in A/44/561 and endorsed by the General Assembly in its resolution 45/57, represents an international institutional mechanism for investigating cases of alleged use of biological or toxin weapons. The Conference notes national initiatives to provide relevant training to experts that could support the Secretary-General's investigative mechanism.

Article IX

47. The Conference reaffirms that this Article identifies the recognized objective of the effective prohibition of chemical weapons.
48. The Conference welcomes the fact that the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction entered into force on 29 April 1997 and that 188 instruments of ratification or accession have now been deposited with the United Nations. The Conference calls upon all states that have not yet done so to ratify or accede to that Convention without delay.
49. The Conference notes the increasing convergence of biology and chemistry

and its possible challenges and opportunities for the implementation of the Conventions.

Article X

50. The Conference stresses the importance of implementation of this Article and recalls that States Parties have a legal obligation to facilitate and have the right to participate in the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes and not to hamper the economic and technological development of States Parties.
51. The Conference reaffirms the commitment to the full and comprehensive implementation of this Article by all States Parties. The Conference recognises that, while recent scientific and technological developments in the field of biotechnology would increase the potential for cooperation among States Parties and thereby strengthen the Convention, they could also increase the potential for the misuse of both science and technology. Therefore, the Conference urges all States Parties possessing advanced biotechnology to adopt positive measures to promote technology transfer and international cooperation on an equal and non-discriminatory basis, particularly with countries less advanced in this field, while promoting the basic objectives of the Convention, as well as ensuring that the promulgation of science and technology is fully consistent with the peaceful object and purpose of the Convention.

52. The Conference recognises the important role of the private sector in the transfer of technology and information and the wide range of organizations within the United Nations system that are already engaged in international cooperation relevant to this Convention.
53. Recognizing the fundamental importance of enhancing international cooperation, assistance and exchange in biological sciences and technology for peaceful purposes, the Conference agrees on the value of working together to promote capacity building in the fields of vaccine and drug production, disease surveillance, detection, diagnosis, and containment of infectious diseases as well as biological risk management. The Conference affirms that building such capacity would directly support the achievement of the objectives of the Convention.
54. The Conference:
- (a) encourages the States Parties to continue strengthening existing international organizations and networks working on infectious diseases, in particular those of the WHO, FAO, OIE and IPPC, within their respective mandates;
 - (b) notes that the role of these organizations is limited to the epidemiological and public/animal/plant health aspects of any disease outbreak, but recognises the added value of information exchange with them;
 - (c) encourages States Parties to improve communication on disease surveillance at all levels, including between States Parties and with the WHO, FAO, OIE and IPPC;
 - (d) calls upon States Parties to continue establishing and/or improving national and regional capabilities to survey, detect, diagnose and combat infectious diseases as well as other possible biological threats and integrate these efforts into national and/or regional emergency and disaster management plans;
 - (e) urges States Parties in a position to do so to continue supporting, directly as well as through international organizations, capacity-building in States Parties in need of assistance in the fields of disease surveillance, detection, diagnosis and combating of infectious diseases and related research;
 - (f) calls upon States Parties to promote the development and production of vaccines and drugs to treat infectious disease through international cooperation and, as appropriate, public-private partnerships.
55. The Conference recognizes the importance of developing effective national infrastructure for human, animal and plant disease surveillance, detection, diagnosis and containment, as well as national biological risk management through international cooperation and assistance.
56. The Conference, while noting existing bilateral, regional and multilateral assistance, cooperation and partnerships, recognizes, however, that there still remain challenges to be overcome in developing international cooperation, assistance and exchange in biological sciences and technology for peaceful purposes and that addressing such problems, challenges, needs and restrictions will help States Parties to build sufficient capacity for disease

surveillance, detection, diagnosis and containment. Keeping in mind Article X, the Conference agrees on the value of targeting and mobilizing resources, including financial resources, to facilitate the fullest possible exchange of equipment, material and scientific and technological information to help overcome challenges to disease surveillance, detection, diagnosis and containment. Recognizing that all States Parties have a role to play, the Conference stresses that those States Parties seeking to build their capacity should identify their specific needs and requirements and seek partnerships with others, and that those States Parties, in a position to do so, should provide assistance and support.

57. The Conference reaffirms that existing institutional ways and means of ensuring multilateral cooperation among all States Parties need to be developed further in order to promote international cooperation for peaceful uses in areas relevant to the Convention, including areas, such as medicine, public health, agriculture and the environment.
58. The Conference calls for the use of the existing institutional means within the United Nations system and other international organizations, in accordance with their respective mandates, to promote the objectives of this Article. In this regard the Conference urges States Parties, the United Nations and its specialized agencies to take further specific measures within their competence for the promotion of the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes

and of international cooperation in this field.

59. The Conference also recognises that there should be efficient coordination mechanisms between the specialized agencies of the United Nations system and international and regional organizations in order to facilitate scientific cooperation and technology transfer.
60. The Conference recognises the need to effectively implement national measures in order to further implementation of Article X. In this regard, the Conference urges States Parties to undertake to review their national regulations governing international exchanges and transfers in order to ensure their consistency with the objectives and provisions of all the articles of the Convention.
61. The Conference encourages States Parties to provide at least biannually appropriate information on how they implement this Article to the Implementation Support Unit within the United Nations Office for Disarmament Affairs, and requests the Implementation Support Unit to collate such information for the information of States Parties. The Conference welcomes the information provided by a number of States Parties on the cooperative measures they have undertaken towards fulfilling their Article X obligations.

Article XI

62. The Conference recalls that the Islamic Republic of Iran has formally presented at the Sixth Review Conference a proposal to amend Article I and the title

of the Convention to include explicitly the prohibition of the use of biological weapons.

63. The Conference recalls the statement at the Sixth Review Conference by the Government of the Russian Federation as a Depositary that it has notified all States Parties of the proposal by the Islamic Republic of Iran to amend the Convention.
64. The Conference reaffirms that the provisions of this Article should in principle be implemented in such a way as not to affect the universality of the Convention.

Article XII

65. The Conference reaffirms that Review Conferences constitute an effective method of reviewing the operation of the Convention with a view to assuring that the purposes of the Preamble and the provisions of the Convention are being realized. The Conference therefore decides that Review Conferences be held at least every five years.
66. The Conference decides that the Eighth Review Conference shall be held in Geneva not later than 2016 and should review the operation of the Convention, taking into account, *inter alia*:
 - (a) new scientific and technological developments relevant to the Convention, taking into account the relevant decision of this Conference regarding the review of developments in the field of science and technology related to the Convention;
 - (b) the progress made by States Parties on the implementation of the Convention;

- (c) progress of the implementation of decisions and recommendations agreed upon at the Seventh Review Conference, taking into account, as appropriate, decisions and recommendations reached at previous review conferences.

Article XIII

67. The Conference reaffirms that the Convention is of unlimited duration and applies at all times, and expresses its satisfaction that no State Party has exercised its right to withdraw from the Convention.

Article XIV

68. The Conference notes with satisfaction that ten states have acceded to or ratified the Convention since the Sixth Review Conference.
69. The Conference underlines that the objectives of the Convention will not be fully realized as long as there remains even a single state not party that could possess or acquire biological weapons.
70. The Conference reiterates the high importance of universalization, in particular by affirming the particular importance of the ratification of the Convention by signatory states and accession to the Convention by those which have not signed the Convention, without delay. States Parties agree to continue to promote universalization.
71. The Conference notes that the primary responsibility for promoting the universality of the Convention rests with the States Parties. The Conference urges States Parties to take action to persuade non-parties to accede to the Convention without delay, and particularly

welcomes action by States Parties and regional initiatives to provide assistance and support that would lead to wider accession to the Convention.

72. The Conference welcomes regional initiatives that would lead to wider accession and adherence to the Convention.
73. The Conference urges those States Parties, in a position to do so, to offer assistance and support to States in their preparations for ratification or accession to the Convention.

Article XV

74. The Conference welcomes the decision of the Sixth Review Conference that as well as the five languages listed in this Article, Arabic shall be considered an official language for the purposes of any meetings of the States Parties and other formal communications concerning the operation of the Convention.

Reference:

1. <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/G12/600/60/PDF/G1260060.pdf?OpenElement>, pp. 9-19

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