

Why Biological Weapons Present The Greatest Danger

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Introduction

1. Although the deliberate use of disease as a weapon, against humans, animals or plants, is totally prohibited by the Biological and Toxin Weapons Convention which entered into force in 1975, the danger that biological weapons may be used by rogue States or terrorist groups is increasingly recognized as presenting the greatest danger of all weapons of mass destruction. It is only six years since for the first time, these International Symposia on Protection against Chemical Warfare Agents expanded their name to include "and Biological Warfare Agents" -- yet there is growing appreciation that biological weapons present the greatest danger. In this paper, I examine this and then consider what we can do to reduce this danger so that the 21st Century can maximise the benefits to mankind around the world from the advances in microbiology and biotechnology.

2. The dangers posed by weapons of mass destruction are compared and historical developments, including the Russian and Iraq biological weapons programmes, examined to show why biological weapons **today** present the greatest danger. They are the easiest to acquire, they have the weakest international prohibition regime and yet their effects can be comparable to those of nuclear weapons.

3. The counter to such attacks is through a web of reassurance -- comprising complete prohibition with a strengthened BTWC Protocol and national implementation, effective controls of the handling, use, storage and transfer of biological materials, preparedness and protective measures which should build on what exists to protect from natural outbreaks together with determined responses to prosecute and punish those who set out to utilize biological weapons. Such a web will **both** deter rogue States or terrorists **and** reassure the public.

4. The paper will examine the developments over the past decade in respect of both the dangers from so-called "rogue" States or from terrorist groups and of the elements making up this web of reassurance. The increasing global concern about the health of humans and animals and the protection of the environment together with security concerns share common goals which demand the building of greater transparency and mutual confidence about national activities and trans-border transfers. The successful bringing together of these international initiatives will bring a healthier, safer and more prosperous and secure world for all. The paper will look forward at the prospects for the 21st Century in order to identify the priorities for urgent international action.

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Why Biological Weapons Pose the Greatest Danger

5. Biological weapons are the use of disease as a weapon of war to attack humans, animals or plants. Such weapons are totally prohibited by the Biological and Toxin Weapons Convention¹ which opened for signature in 1972 and entered into force in 1975. Why then some 20 years later did President Clinton in his address² to the United Nations General Assembly on 24 September 1996 say that "*we must better protect our people from those who would use **disease as a weapon of war***". [Emphasis added]. Similar emphasis on biological weapons has been reflected in the NATO summits -- the Washington Summit communiqué issued on 24 April 1999 by the NATO Heads of State and Government noted³ that "*the proliferation of nuclear, biological and chemical (NBC) weapons and their means of delivery can pose a threat to Allied populations, territory and forces and therefore continues to be a matter of serious concern for the Alliance. The Communiqué went on to announce a Weapons of Mass Destruction (WMD) initiative "to improve overall Alliance political and military efforts in this area. The WMD initiative will: ensure a more vigorous, structured debate at NATO leading to strengthened common understanding among Allies on WMD issues and how to respond to them;...support the development of a public information strategy by Allies to increase awareness of proliferation issues and Allies efforts to support non-proliferation efforts; enhance existing Allied programmes which increase military readiness to operate in a WMD environment and to counter WMD threats;...enhance the possibilities for Allies to assist one another in the protection of their civil populations against WMD risks;..."* This WMD Initiative thus carries forward the importance of both prevention and protection against biological weapons emphasized in the earlier North Atlantic Council Ministerial communiqué which in June 1997 stated⁴ that "*While prevention remains our primary aim, we recognize that proliferation of nuclear, chemical and biological (NBC) weapons and their means of delivery...can pose a direct military threat to the Alliance. We therefore welcomed the increased attention which Alliance defence planning is now paying to the capabilities and concepts needed to deter and, if necessary, respond to, the use of NBC weapons, with particular emphasis on enhancing protection for deployed forces at or beyond NATO's periphery and improving protection against biological weapons.*" [Emphasis added].

6. In December 2000, a document⁵ addressing *Global Trends 2015* identified the drivers and trends noting that "*The continuing diffusion of information technology and new applications of biotechnology will be at the crest of the wave*" and goes on to state that the United States will face "*Strategic WMD threats,...and the potential for unconventional delivery of WMD by both states or nonstate actors also will grow.*" In the context of key uncertainties in regard to science and technology it is stated that "*Rapid advances and diffusion of biotechnology,*

¹United Nations, *Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction*, General Assembly resolution 2826(XXVI), 16 December 1971.

²The White House, Remarks by the President in Address to the 51st General Assembly of the United Nations, 24 September 1996.

³NATO, *Washington Summit Communiqué*, issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Washington, D.C. on 24th April 1999. Press Release NAC-S(99)64, 24 April 1999.

⁴NATO, *Final Communiqué, Meeting of the North Atlantic Council in Defence Ministers Session*, Press Release M-NAC-D-1(97)71, Brussels, 12 June 1997.

⁵Central Intelligence Agency, National Intelligence Council, *Global Trends 2015: A Dialogue with Nongovernment Experts*, Report NIC 2000-02, December 2000. Available at <http://www.cia.gov/publications/globaltrends2015/index.html#link9b>

nanotechnology, and the materials sciences, moreover, will add to the capabilities of our adversaries to engage in biological warfare or bio-terrorism." This concern was echoed in the January 2001 US Department of Defense publication⁶ "Proliferation: Threat and Response" in which the then Secretary of Defense said that "At least 25 countries now possess -- or are in the process of acquiring and developing capabilities to inflict mass casualties and destruction: nuclear, biological and chemical weapons or the means to deliver them."

7. President George W. Bush in his Inaugural Address⁷ said "We will confront weapons of mass destruction, so that a new century is spared new horrors" and less than a month later said⁸ "First, we must prepare our nations against the dangers of a new era. The grave threat from nuclear, biological and chemical weapons has not gone away with the Cold War. It has evolved into many separate threats, some of them harder to see and harder to answer. And the adversaries seeking these tools of terror are less predictable, more diverse." The Director of Central Intelligence in February 2001 said⁹ that "Terrorist groups are actively searching the internet to acquire information and capabilities for chemical, biological, radiological, and even nuclear attacks. Many of the 29 officially designated terrorist organizations have an interest in unconventional weapons, and Usama bin Laden in 1998 even declared their acquisition "a religious duty"." Why then this increased and continuing concern about biological weapons and how can disease be used as a weapon of war?

8. The use of biological weapons in war goes back into antiquity¹⁰ to examples such as the use of smallpox infected blankets in gifts to the American Indians. The deliberate use of disease as a weapon of war is biological warfare -- the deliberate attack of humans, animals or plants by disease. Biological warfare is included in the Geneva Protocol of 1925 which prohibited the use of chemical or biological materials in war and the Biological and Toxin Weapons Convention of 1972 prohibited the development, production, stockpiling or acquisition of an entire class of weapons. Because biological agents (other than toxins) multiply in the infected target population, the quantities needed to cause infection are very much smaller than the amounts of chemical agent needed to cause harm - a few biological micro-organisms may suffice. Consequently, biological weapons have a significantly larger potential area of effect than have chemical weapons and hence the potential impact of biological weapons approaches that of nuclear weapons and can have strategic effects. This can be illustrated by considering the typical downwind hazard area resulting from a chemical or biological weapon attack (see Figure 1).

⁶U. S. Department of Defense, *Proliferation: Threat and Response*, January 2001. Available at <http://www.defenselink.mil>

⁷The White House, *President George W. Bush's Inaugural Address*, 20 January 2001. Available at <http://www.whitehouse.gov/press/text/inaugural-address.htm>

⁸The White House, *Remarks by the President to the Troops and Personnel*, 13 February 2001. Available at <http://www.whitehouse.gov/news/releases/20010213-1.html>

⁹Central Intelligence Agency, *Worldwide Threat 2001: National Security in a Changing World*, Statement by Director of Central Intelligence George J. Tenet before the Senate Select Committee on Intelligence, 7 February 2001. Available at <http://www.cia.gov>

¹⁰Mark Wheelis, *Biological warfare before 1914*, in *Biological and Toxin Weapons: Research, Development and Use from the Middle Ages to 1945*, ed. Erhard Geissler and John Ellis van Courtland Moon, SIPRI, Oxford University Press, 1999.

FIGURE 1
CBW DOWNWIND HAZARD

	Classical CW	Industrial Pharmaceutical Chemicals	Bioregulators Peptides	Toxins	Genetically Modified BW	Traditional BW
1 km						
10 km						
100km						
1000 km						

This figure also shows the way in which chemical and biological weapons can be regarded as a spectrum ranging from the classical chemical warfare agents through mid-spectrum agents such as bioregulators and toxins to the traditional biological warfare agents. The Chemical Weapons Convention¹¹ which entered into force on 29 April 1997 prohibits the development, production, stockpiling, acquisition and use of any chemicals for hostile purposes and thus overlaps in the area of toxins, which are non-living chemicals, with the prohibition of toxins under the BTWC.

9. The downwind hazard can extend to a few hundred kilometres if the meteorological conditions are optimum. Trials to demonstrate that biological organisms could be effectively disseminated over both land and sea were carried out following World War II and there is no doubt that hazard distances can indeed extend to some hundred kilometres downwind. As the quantities required for BW are small compared to chemical weapons, they can be disseminated by cross-wind dissemination with few if any indications of hostile intent. A simple dissemination system such as one mounted on a single aircraft flying across the wind could be used to produce a line source of 200 km or so long resulting in an attack of an area of some 200 km wide by 200 km downwind; a vehicle driven across the wind could produce a shorter line source of perhaps 50 km in length attacking a proportionately smaller area. The Office of Technology Assessment of the US Congress in an evaluation¹² of weapons of mass destruction showed that a single aircraft attack of Washington DC using anthrax could result in 1 to 3 million deaths; in the same scenario, a one megaton hydrogen bomb would

¹¹Organisation for the Prohibition of Chemical Weapons, *Chemical Weapons Convention*, available at <http://www.opcw.org>

¹²United States Congress, Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks*, OTA-ISC-559, S/N 052-003-01335-5, dated 5 August 1993. United States Congress, Office of Technology Assessment, Background Paper, *Technologies Underlying Weapons of Mass Destruction*, OTA-BP-ISC-115, S/N 052-003-01361-4, dated December 1993.

only cause some 0.5 to 1.9 million deaths. Such attacks with biological agents present a serious challenge to personnel in military targets such as naval task forces and assembly areas or to strategic targets. Likewise, if used to attack livestock or plants, a significant effect could be produced. Although BW were perceived to be unreliable and to offer the prospect of inadvertently attacking one's own forces, the feasibility of BW was demonstrated in UK and US trials prior to the termination of those retaliatory programmes in the mid 1950s and in 1969 respectively. There is thus no doubt about the danger posed by such weapons -- and it is for that reason that they are totally prohibited by the BTWC which entered into force in 1975.

10. A useful comparison (see Table 1) of nuclear, biological and chemical weapons was made by a US Congressional Committee¹³ which shows clearly that biological weapons are the easiest to acquire as many pathogens are endemic -- i.e. occur in nature, have the least cost and least signature yet have comparable strategic effects to nuclear weapons.

TABLE 1

Type	Technology	Cost	Signature	Effectiveness	
				Tactical	Strategic
Nuclear	Very high	Very high	Very high	Very high	Very high
Biological	High	Low	Low	Low	Very high
Chemical	High	High	High	Very high	Low

Taken together, it is clear that **biological weapons present the greatest danger today** of all three weapons of mass destruction as they are the easiest to acquire, have the weakest regime and yet have effects comparable to nuclear weapons. Consequently, countering biological weapons is a key security priority.

11. When the arms control regimes associated with the three types of weapons of mass destruction are considered, it is clear that the Nuclear Non-Proliferation Treaty regime augmented by the '93 + 2' Additional Protocol and the Chemical Weapons Convention (CWC) regime are much stronger than that of the BTWC. Indeed, it is for that reason that the BTWC is the subject of ongoing negotiations of a Protocol to strengthen the BTWC.

12. The past decade has seen a move from the bipolar super-power stand-off of the Cold War era into a rash of regional conflicts around the world and collapsed economies. The deliberate use of disease – against humans, animals or plants – may become to be regarded as a possible option, if action is not taken to make this unattractive, especially by small States whose conventional military capabilities may be limited. This heightened concern was reflected in 1997 in the United States Quadrennial Defense Review statement¹⁴ that *"In particular, the threat or use of chemical or biological weapons (CBW) is a likely condition of*

¹³US Congress, Committee on Armed Services, House of Representatives, 23 February 1993.

¹⁴US Department of Defense, William S. Cohen, Secretary of Defense, *Report of the Quadrennial Defense Review*, May 1997. Available at [http://www.http://www.defence link.mil/pubs/](http://www.defence link.mil/pubs/)

future warfare, including the early stages of war to disrupt U.S. operations and logistics." and "Indeed, US dominance in the conventional military arena may encourage adversaries to use such asymmetric means to attack our forces and interests overseas and Americans at home." It goes on to argue that "Moreover, given that the United States will most likely conduct future operations in coalition with others, we must encourage our friends and allies to train and equip their forces for effective operations in CBW environments." It was reiterated in January 2001 by the US Secretary of Defense who said¹⁵ that "At the dawn of the 21st Century, the United States now faces what could be called the Superpower Paradox. Our unrivalled supremacy in the conventional military is prompting adversaries to seek unconventional asymmetric means to strike what they perceive as our Achilles heel."

13. So what has happened over the past two decades to cause President George W. Bush address weapons of mass destruction in his inaugural address and thus reflect his predecessor's expression of concern to the United Nations and for NATO to establish a WMD Initiative and place emphasis on protection against biological weapons? The past two decades has seen the burgeoning of biotechnology making it easier to produce biological materials and to modify them so as to enhance their effects. Advances in microbiology, genetic engineering and biotechnology have seen immense benefits for the health of people and animals around the world with the biotechnology industry being one of the principal growth areas offering the prospect of new and improved diagnostic techniques and medical countermeasures to the increasing range of diseases that threaten the health and well-being of people and animals worldwide. However, the diseases which these advances are used to counter occur in nature and their countermeasures require an understanding of the ways in which such diseases attack the target population - and thereby **underlines** the importance of strengthening the implementation of the Biological and Toxin Weapons Convention (BTWC) as both the causative agents and the methods used to produce them are dual purpose and can be used both for prohibited purposes as well as for permitted purposes to promote health and well-being.

14. The BTWC was agreed at a time when treaties were generally short documents - the BTWC is some four pages long - and contained no provisions for verification. The past 20 years has seen the acceptance internationally of on-site inspection in all recent arms control treaties - the Chemical Weapons Convention has a detailed Verification Annex of some 100 pages which details how on-site inspections may be carried out making it clear that the onus is on the Inspected State to demonstrate to the Inspectorate that it is in compliance with the Convention. In parallel with the increased acceptance of on-site inspection in arms control treaties, it has become apparent that biological weapons have become an attractive option for a number of States and their proliferation has increased during the past 20 years.

15. This concern about non-compliance has been sharpened during the past 5 years first by the admission by President Yeltsin in 1992 that the former Soviet Union, despite being a codepositary along with the United Kingdom and the United States of the BTWC, had continued an offensive biological weapons programme in breach of the Convention for 20 years up to 1992. Then in 1995, Iraq disclosed to the United Nations Special Commission (UNSCOM) that, despite being a signatory of the BTWC, Iraq had had a significant biological weapons programme which had seen the filling of aerial bombs and of Al Hussein missile warheads with biological agents and their deployment to four locations in the run up to the Gulf War of 1991. It has also become apparent with the use of the nerve agent sarin

¹⁵US Department of Defense, William S. Cohen, Secretary of Defense, *Proliferation: Threat and Response*, January 2001. Available at <http://www.defenselink.mil>

in the attacks in the Tokyo subway in March 1995 that there is a real danger that chemical and biological materials may be used for terrorist purposes - and this led the Heads of the G7 States at their meeting in Lyon, France on 27 June 1996 in their Declaration on Terrorism to state¹⁶ that "Special attention should be paid to **the threat of utilisation** of nuclear, **biological** and chemical materials, as well as toxic substances, **for terrorist purposes.**" [Emphasis added] Subsequently, there has been much attention given, especially in the United States, to the enhancement of preparedness against such terrorist attacks.

16. There is concern that the number of States possessing or seeking biological weapons has actually doubled since the entry into force of the BTWC -- a statement made by the US delegation to the BTWC Fourth Review Conference in 1996. The importance of and the danger from biological weapons was reinforced in July 1999 by a United Kingdom Ministry of Defence report¹⁷ on defending against the threat of chemical and biological weapons which states that "***The potential threat from biological and chemical agents is now greater than that from nuclear weapons.***" [Emphasis added] More recently, the Director of Central Intelligence in March 2000 said¹⁸ that "*About a dozen states, including several hostile to Western democracies -- Iran, Iraq, Libya, North Korea and Syria -- now either possess or are actively pursuing offensive biological and chemical capabilities for use against their perceived enemies, whether internal or external. Some countries are pursuing an asymmetric warfare capability and see biological and chemical weapons as a viable means to counter overwhelming US conventional military superiority. Other states are pursuing BW programs for counterinsurgency use and tactical applications in regional conflicts, increasing the probability that such conflicts will be deadly and destabilizing.*"

17. In summary then, why are biological weapons perceived to be attractive to the so-called "rogue states" or to non-State actors such as terrorist groups. Insofar as States are concerned, biological weapons can be seen as providing a means of waging asymmetric warfare against an adversary with superior military capabilities -- they are easy to acquire as biological agents occur in nature as the causative agents of disease and their prohibition regime is weaker than that for nuclear or chemical weapons yet the effects of biological weapons can be comparable to those of nuclear weapons. As for non-State actors, the attraction of biological weapons is far less evident as the skills necessary to produce and disperse biological agents in an effective way are non-trivial. In contrast to the use of high explosives where the effect is instantaneous and the consequences of the explosion are highly predictable, a biological agent will have a delayed effect and the consequences of the biological weapon will depend on the precise meteorological conditions at the instant of release as to where and how the agent is dispersed and whether it will indeed reach the target population. Whilst attention has traditionally focussed upon biological weapons against human targets, it must be remembered that biological weapons have also been developed against animals and plants -- and the increasing national and international sensitivity to food safety makes biological weapon attacks against animals or plants of greater concern. Nevertheless, it is evident that biological weapons, if dispersed efficiently and effectively, can cause comparable effects to nuclear

¹⁶United Nations General Assembly/Security Council, Letter dated 5 July 1996 from the Permanent Representative of France to the United Nations addressed to the Secretary-General, A/51/208, S/1996/543, 12 July 1996. Annex V: Declaration on Terrorism, Lyon, 27 June 1996.

¹⁷Ministry of Defence, *Defending Against the Threat from Biological and Chemical Weapons*, July 1999. Chapter 2 - The Threat, para 1. Available at <http://www.mod.uk/policy/cbw/chapter2.htm>

¹⁸George J. Tenet, Director of Central Intelligence, Statement to the Senate Foreign Relations Committee, *Worldwide Threat in 2000: Global Realities of Our National Security*, 20 March 2000. Available at http://www.cia.gov/cia/public_affairs/speeches/dci_speech_032100.html

weapons and it is therefore right that international attention is focussed on countering such weapons.

The Web of Reassurance

18. The counter to biological weapons whether used by "rogue States" or by non-State actors lies in a web of reassurance -- to reassure the State and its public that such weapons are totally prohibited and, if used, will have minimal effect. The elements of such a web are:

- a. Strong international and national prohibition regime reinforcing the norm that biological weapons are totally prohibited
- b. Broad international and national controls on the handling, storage, use and transfer of dangerous pathogens
- c. Preparedness including both active and passive protective measures and response plans that have been exercised
- d. Determined national and international response to any use or threat of use of biological weapons ranging from diplomatic sanctions through to armed intervention,

which are together mutually reinforcing and lead a would-be possessor to judge that acquisition and use of BW would not be valuable, would be detected and incur an unacceptable penalty.

19. Such a web of reassurance was previously known as a web of deterrence¹⁹ at a time when there was still a bipolar world. Now in an age of regional or local conflicts with increasingly developed governments around the world where there will be increased transparency of government decisions made available to the public through developments in information technology, the public will demand reassurance that their national governments have taken all reasonable steps to protect them from the dangers of biological weapon attacks whether from "rogue States" or non-State actors. It is, consequently, a web of reassurance that is needed for both States and their public.

20. The developments and trends for each element of the web of reassurance are considered in turn.

Strong International and National Prohibition Regime

21. The norm that the development, production, storage, acquisition or use of biological weapons are totally prohibited is established by the Geneva Protocol of 1925 and the Biological and Toxin Weapons Convention (BTWC) of 1972. The Geneva Protocol prohibits the use of chemical and biological weapons. Although a number of States parties had entered reservations which would have enabled them to retaliate in kind should such weapons have been used against them, these reservations have increasingly been given up in the last few years. Now that the CWC has entered into force, all States still retaining such reservations to the Geneva Protocol should be urged to relinquish them.

¹⁹Graham S Pearson, *Prospects for Chemical and Biological Arms Control: The Web of Deterrence*, The Washington Quarterly, Spring 1993, pp 145–162. Graham S. Pearson, *The Vital Importance of the Web of Deterrence*,

22. The BTWC entered into force in 1975: as of July 1999 it has 143 States Parties and 18 Signatory States²⁰. The scope of its prohibition is very broad as Article I contains a general purpose criterion shown in bold below:

Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain:

*(1) Microbial or other biological agents, or toxins, whatever their origin or method of production, **of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;***

(2) Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict. [Emphasis added]

23. Successive Review Conferences have reaffirmed that the prohibition in Article I applies to all developments by language such as that agreed at the Fourth Review Conference in 1996²¹ that:

*The Conference, conscious of apprehensions arising from relevant scientific and technological developments, inter alia, in the fields of microbiology, biotechnology, molecular biology, genetic engineering and any applications resulting from genome studies, and the possibilities of their use for purposes inconsistent with the objectives and the provisions of the Convention, reaffirms that the undertaking given by the States Parties in Article I applies to **all such developments.** [Emphasis added]*

The Fifth Review Conference to be held in November/December 2001 can be expected to make a similar all embracing reaffirmation.

24. The prohibition of use is not specifically addressed in the body of the BTWC although the Preamble in stating that *Determined, for the sake of all mankind, to exclude completely the possibility of bacteriological(biological) agents and toxins being used as weapons*, makes it clear that the intent is to prohibit use. This intent to prohibit use was reinforced at the Fourth Review Conference by language stating that:

*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 of the Convention.*

*The Conference reaffirms the undertaking in Article I never in any circumstance 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.**[Emphasis added]*

²⁰United Nations, *List of States Parties to the Convention on the Prohibition of the development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction*, BWC/AD HOC GROUP/INF. 20, 20 July 1999.

²¹United Nations, *Fourth Review Conference of the Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, Final Declaration*, Final Document, BWC/CONF.IV/9, 6 December 1996.

25. The BTWC has no provisions for verification or for the monitoring of compliance. At the Third Review Conference in September 1991 following the Persian Gulf war of 1990/1991, the States Parties *"determined to strengthen the effectiveness and improve the implementation of the Convention"* established an Ad Hoc Group of Governmental Experts to examine possible verification measures from a scientific and technical viewpoint.²² This Group (known as VEREX) met twice in 1992 and twice in 1993. Its final report was considered by a Special Conference in September 1994 which established an Ad Hoc Group (AHG) to consider appropriate measures, including possible verification measures, and draft proposals to strengthen the Convention, to be included, as appropriate, in a legally binding instrument.

26. The AHG commenced its work in January 1995 and, as of March 2001 has met 22 times. In September 1996 the AHG decided to intensify its work and in July 1997 it successfully transitioned to consideration of a rolling text for the Protocol to strengthen the BTWC. This had, by January 2001, reached its fourteenth version and could now be described as having some islands of bracketed text, showing alternatives, in oceans of clean text. It is thus evident that the Protocol is close to completion and all the States Parties engaged in the AHG are working to complete the negotiations by the Fifth Review Conference to be held in November/December 2001. All the essential elements for the Protocol are now in the rolling text -- Mandatory Declarations, Declaration Follow-Up Procedures, Investigations of compliance concerns together with measures to strengthen the implementation of Article X (cooperation for peaceful purposes) and other Articles of the BTWC.

27. The AHG met in 2000 for a total of 13 weeks: 3 weeks in January, 3 weeks in March, 4 weeks in July/August and 3 weeks in November/December. In 2001, it has met for 2 weeks in February and 3 weeks in April/May and will meet for 4 weeks in July/August. There is a real opportunity to complete the Protocol this year. In November 2000 the European Union in its statement²³ to the AHG said that the member States of the EU *"today affirm their determination to respect the 2001 deadline which is mandatory for all the States Parties to the Convention."* It was evident towards the end of 2000 that the AHG negotiations had entered their final phase with the presentation by the Netherlands and Switzerland of their bids for the Seat of the Organization to be located in The Hague and Geneva, respectively; the appointment of facilitators to address topics such as harmonization of various aspects of the text, the setting up of a Preparatory Commission and the Headquarters Agreement with the Host Country. The negotiations were moving away from the sessions chaired by the Friends of the Chair who had taken their respective elements of the Protocol text as far as possible and into more informal negotiations considering the Protocol as a whole and to so-called 'bracket bazaars' when brackets in widely ranging parts of the text were considered for removal. On 30 March 2001, Ambassador Tibor Tóth, The Chairman of the Ad Hoc Group issued to delegations his composite text²⁴ which is firmly based on the rolling text²⁵ of the

²²United Nations, *The Third Review Conference of 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*, Geneva, 9–27 September 1991, BWC/CONF.III/23, Geneva 1992.

²³Ambassador Hubert de la Fortelle, *Statement to the 21st session of the Ad Hoc Group delivered by Ambassador Hubert de la Fortelle, Permanent Representative of France, on behalf of the European Union*, Geneva, 20th November 2000.

²⁴United Nations, *Ad Hoc Group of 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*, BWC/AD HOC GROUP/CRP.8(FUTURE), 30 March 2001, Geneva.

Protocol; indeed, over 99 per cent of the language in the Chairman's composite Protocol text is language that is already in the rolling text. The composite Protocol text has adopted compromises, based on the written elements of the text issued by the Chairman following his extensive and intensive bilateral negotiations over the last nine months with delegations to explore conceptual solutions based on the rolling text, to address the remaining issues where there were differing views. At the twenty-third session of the Ad Hoc Group held from 23 April to 11 May 2001, it was evident that whilst all States Parties had reservations about some of the compromises adopted, a number of States regarded the Chairman's composite Protocol text as the basis for further negotiation.

28. There is thus a real prospect that the Protocol will be completed this year. The emphasis will then move to achieving an early entry into force of the Protocol and for universality both of the Protocol and of the BTWC. The implementation of the Protocol will underline the importance of States Parties to the BTWC taking appropriate national measures to implement the Convention in accordance with Article IV of the Convention under which:

Each State Party to this Convention shall, in accordance with its constitutional processes, take any necessary measures to prohibit and prevent the development, production, stockpiling, acquisition, or retention of the agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, within the territory of such State, under its jurisdiction or under its control anywhere.

29. The composite Protocol text²⁶ in *Article 17 National Implementation Measures* has the following language:

1. In addition to its obligations under the Convention, including Article IV, each State Party shall, in accordance with its constitutional and legal processes, take any measures required to implement its obligations under this Protocol. In particular, it shall where appropriate and necessary:

(a) Prohibit natural and legal persons anywhere on its territory or in any other place under its jurisdiction as recognized by international law from undertaking any activity prohibited to a State Party under the Convention, including enacting penal legislation with respect to such a prohibition;

(b) Prohibit natural and legal persons from undertaking any activity prohibited to a State Party under the Convention anywhere under its control; and

(c) Prohibit, in conformity with international law, natural persons possessing its nationality from undertaking any activity prohibited to a State Party under the Convention anywhere.

²⁵United Nations, *Procedural Report of the Ad Hoc Group of 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*, BWC/AD HOC GROUP/55-1 and 55-2, 1 March 2001, Geneva.

²⁶United Nations, *Ad Hoc Group of 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*, BWC/AD HOC GROUP/CRP.8(FUTURE), 30 March 2001, Geneva.

30. Such provisions require States Parties to enact appropriate legislation. For example, the United Kingdom in 1974 enacted the Biological Weapons Act which implemented the BTWC and included language in that Act which specifies that:

1.--(1) No person shall develop, produce, stockpile, acquire or retain:

(a) any biological agent or toxin of a type and in a quantity that has no justification for prophylactic, protective or other peaceful purposes; or

(b) any weapon, equipment or means of delivery designed to use biological agents or toxins for hostile purposes or in armed conflict.

(2) In this section--

"biological agent" means any microbial or other biological agent; and

"toxin" means any toxin, whatever its origin or method of production.

(3) Any person contravening this section shall be guilty of an offence and shall, on conviction on indictment, be liable to imprisonment for life.

This language reproduces the basic prohibition in Article I of the BTWC which states that:

Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain:

(1) Microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;

(2) Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.

thereby meeting the obligations in Article IV of the BTWC and implementing the basic prohibition nationally.

31. The BTWC Protocol regime has been crafted to incorporate a range of measures -- mandatory declarations of the activities and facilities of greatest relevance to the BTWC, declaration follow-up procedures including randomly-selected transparency visits, declaration clarification procedures and voluntary assistance visits, measures to ensure submission of declarations, consultation, clarifications and cooperation, field and facility investigations, as well as measures to promote scientific and technical exchange and international cooperation. These elements together increase transparency within a State Party and enhance confidence between States Parties that the activities carried out within States Parties are in compliance with the Convention. There is considerable scope for interaction and synergism between the elements in the different measures and it is evident that the elements are indeed complementary.

32. Insofar as the danger from bioterrorism is concerned, the Protocol provides a useful tool that helps to counter this danger. The requirements in *Article 17 National Implementation Measures* for the enactment of national legislation including penal legislation makes it an

offence for any individual within a State Party to develop, produce, acquire, stockpile biological agents or toxins for other than in types and quantities that have justification for peaceful purposes. It is also evident that the obligations in Article III (non-transfer) of the Convention require States Parties to introduce national regulations to control the possession, handling, storage and use of biological agents and toxins -- and such national regulations are also necessary to protect public health and the environment. The overall effect of the Protocol and its implementation nationally is to enhance awareness of the potential dangers from biological agents and toxins and so to increase the attention given to ensuring that such materials are not diverted for prohibited purposes. The provisions in the Protocol for the promotion of scientific and technological exchange will help States Parties develop the necessary national infrastructure to achieve the safe handling, storage and use of biological agents and toxins.

33. The BTWC Protocol regime has been successfully developed from both the previous confidence-building measures agreed by the BTWC States Parties at the Second Review Conference in 1986 and extended and strengthened at the Third Review Conference in 1991 and from the experience and the perceptions of the CWC regime which opened for signature in 1993 and entered into force in 1997. Although there are differences between the BTWC Protocol and the CWC regimes, a quantified and comparative evaluation²⁷ of the two regimes has shown that an effective and efficient BTWC Protocol regime is being developed. It is clear that the provisions for the two regimes will both be effective in strengthening the norm against biological and chemical weapons -- and the BTWC Protocol regime will achieve its objective of strengthening the effectiveness and improving the implementation of the Convention. It is also clear that from a comparison²⁸ of the BTWC Protocol regime with the BTWC alone that the Protocol regime brings significant health, safety, security and prosperity benefits to all States Parties.

International and national controls on dangerous pathogens

34. The dangers from pathogens to humans, animals or plants has long been recognised and countries have increasingly introduced national regulations and controls on the handling, use and storage of such pathogens in order to protect public health and the environment²⁹. These controls have frequently required the creation of national inspectorates who may be required to inspect facilities and give approval prior to a facility starting working with a particular pathogen or before pathogens are transferred between facilities. Such controls have been harmonized regionally -- most notably in the European Union -- as well as internationally through the WHO, OIE and FAO. In respect of transfers, Article III of the BTWC requires that:

Each State Party to this Convention undertakes not to transfer to any recipient whatsoever, directly or indirectly, and not in any way to assist encourage, or induce any State, group of States or international organizations to manufacture or otherwise

²⁷ Graham S. Pearson & Malcolm R. Dando, *The Emerging Protocol: An Integrated, Reliable and Effective Regime*, University of Bradford, Department of Peace Studies, Briefing Paper No 25, September 1999. Available at <http://www.brad.ac.uk/acad/sbtwc>.

²⁸ Graham S. Pearson, *The Regime To Prevent Biological Weapons: Opportunities For A Safer, Healthier, More Prosperous World*, Seventh International Symposium on Protection against Chemical and Biological Warfare Agents, Stockholm, Sweden, 15-19 June 2001.

²⁹ Graham S. Pearson, *Article X: Further Building Blocks*, University of Bradford, Department of Peace Studies, Briefing Paper No 7, March 1998. Available at <http://www.brad.ac.uk/acad/sbtwc>.

acquire any of the agents, toxins, weapons, equipment or means of delivery specified in Article I of the Convention.

This effectively places a responsibility on each State Party to satisfy itself that any transfer of agents or equipment will not be used for prohibited purposes. However, it is important to recognize that the BTWC requirement is not one that stands alone without regard to the national and international environment relating to biological agents and equipment. There are increasing concerns around the world about the possibility that sub-State actors or terrorist groups make seek to use biological materials and equipment as weapons to achieve their aims. Furthermore, it has to be recognised that increasingly countries are concerned about public, animal and plant health, about the environment and about trade in an increasing variety of goods as all States are keen to live in a safer, more prosperous world.

35. To an increasing extent States are establishing the national infrastructure and controls to ensure that biological agents and equipment are handled, used and transferred only to approved facilities, which increasingly are inspected by national agencies on a regular basis, so that public confidence can be built that the public and their environment are not being put at unnecessary risk through uncontrolled handling, use and transfer. Similar infrastructure and controls are also being sought by States who wish to deny the availability of such agents and materials to sub-State actors or terrorist groups. Furthermore, trade depends on the regular supply of quality goods which need to be inspected and checked to ensure that they are free from disease or harmful contaminants -- the recent European concerns about BSE, swine fever and foot and mouth disease in animals underlines the necessity for such controls. The concerns in Europe about genetically-modified foods reflect similar concerns about genetically-modified organisms which led to the entry into force of the Convention for Biological Diversity which opened for signature at the Earth Summit in Rio de Janeiro in 1992 and in January 2000 to the agreement of the Cartagena Protocol on Biosafety which includes provisions for advanced informed agreement prior to transborder movement of such genetically-modified organisms. It is thus clear that increasingly States are developing the necessary national infrastructure and controls to build public confidence within that State that the public and the environment are not at risk from biological agents and equipment.

36. Such controls on the handling, use, storage and transfer of biological agents and toxins contribute to ensuring that such agents are only used for permitted purposes and do not fall into the hands of those who are seeking to misuse them and cause harm whether to humans, animals or plants.

Preparedness including both Active and Passive Protective Measures

37. Outbreaks of disease and intoxications do occur naturally around the world -- whether of Ebola virus in Africa or of food and mouth disease in Europe -- and States have developed responses to contain and deal with such outbreaks. These preparedness plans for naturally occurring outbreaks of disease can and should form the basis of plans to counter deliberate outbreaks of disease -- whether caused by a State or by non-State actors. Much attention has rightly been paid by NATO and a number of other nations to ensuring that their armed forces have effective protective measures should biological weapons be used against them. A few States -- notably Sweden, Switzerland and Israel -- have also extended such protective measures to their civilian population through the concept, in Sweden, of total defence. There is, however, much variability in the national protective measures against biological weapons

and the importance of achieving more uniform protective capabilities for coalition forces has been recognized.³⁰

38. Concern about the possible use of biological agents by terrorists, following the Aum Shinrikyo use of sarin in the Tokyo subway in March 1995 and the subsequent indication that they had also been seeking biological weapons, has attracted much attention in the United States during the past few years with significant resources -- in excess of \$11 billion -- being directed to combating terrorism. Whilst there is undoubtedly a potential for terrorist groups to use biological agents against humans, animals or plants -- and therefore it is prudent to have a preparedness response plan that is exercised -- there is some indication that the US response has not been as well focussed as it might be. The US Government Accounting Office (GAO) in a series of reports has emphasized the importance of developing a sound understanding of the terrorist threat³¹ -- and have noted that *"terrorists would have to overcome significant technical and operational challenges to successfully make and release many chemical and biological agents of sufficient quality and quantity to kill or injure large numbers of people without substantial assistance from a foreign government sponsor."* and that qualifications such as this are important in avoiding policy makers obtaining an exaggerated view of the terrorist chemical and biological threat. The GAO has also stressed the importance of not using improbable "worst case scenarios" to plan and develop response programmes but rather to counter credible threats. A GAO survey³² of the way in which Canada, France, Germany, Israel and the United Kingdom respond to terrorist threats has shown that, because of limited resources, response programmes are selected on the basis of the likelihood of terrorist activity taking place, not on the countries overall vulnerability to terrorist attacks. In respect of chemical, biological, radiological or nuclear attacks, it was noted that whilst each country may be vulnerable to such an attack, it was felt that such attacks were *"unlikely for a variety of reasons, including the difficulties terrorists would face in producing and delivering such weapons."* Consequently, these countries *"maximize their existing capabilities to address a wide array of threats, including emerging threats like chemical, biological, radiological or nuclear, before they create new capabilities or programs to respond to such attacks."*

39. It is, however, evident that preparedness will continue to be an important element of the web of reassurance into the future because of the dual-use nature of biological agents and toxins. Protective measures -- both active and passive -- have a key role to play in reassuring the public that all reasonable national steps have been taken to be prepared should biological weapons be used -- whether by a State or by a non-State actor. Such response plans should be based on the existing plans to counter outbreaks of disease -- in humans, animal or plants - - as such outbreaks, resulting from natural causes, will continue to occur from time to time and will need to be contained and treated effectively and efficiently.

Determined National and International response

³⁰Brad Roberts & Graham S. Pearson, *Bursting the biological bubble: how prepared are we for biowar?*, Jane's International Defense Review, No. 31, pp. 21- 24, 4/1998

³¹US Government Accounting Office, *Combating Terrorism: Linking Threats to Strategies and Resources*, GAO/T-NSIAD-00-218, 26 July 2000. US Government Accounting Office, *Combating Terrorism: Observations on the Threat of Chemical and Biological Terrorism*, GAO/T-NSIAD-00-50, 20 October 1999. US Government Accounting Office, *Combating Terrorism: Need for Comprehensive Threat and Risk Assessments of Chemical and Biological Attacks*, GAO/NSIAD-99-163, September 1999. Available at <http://www.gao.gov>

³²US Government Accounting Office, *Combating Terrorism: How Five Foreign Countries are Organized to Combat Terrorism*, GAO/NSIAD-00-85, April 2000. Available at <http://www.gao.gov>

40. Any use or threat of use of biological weapons needs to be countered by a determined response both nationally and internationally. The international prohibition regime needs to be implemented nationally and any breach -- or threat of a breach -- dealt with firmly and effectively so sending the message to other would be perpetrators that the acquisition of biological weapons will not be tolerated. The Harvard-Sussex Programme initiative³³ to prohibit chemical and biological weapons under international criminal law as a crime against humanity akin to piracy, torture and hijacking is to be commended as it underlines the message that such weapons are totally prohibited.

41. Unfortunately, the developments internationally in regard to determined responses to any use or threat of use of biological weapons in the last few years in this respect have been decidedly mixed -- the Chemical Weapons Convention (CWC) which covers toxins came into force in 1997 and has successfully been implemented although it has been plagued by late submissions of declarations and bureaucratic difficulties. The trilateral agreement between Russia, the United States and the United Kingdom intended to build confidence that the former Soviet Union's offensive biological weapons programme has indeed been dismantled has run into the sand. The language addressing the status of this trilateral process in successive US Arms Control and Disarmament Agency (ACDA) reports has been unchanged³⁴ noting that "*while there has been progress..., the progress has not resolved all US concerns.*" The situation in respect of Iraq is decidedly gloomy with the suspension of UNSCOM in December 1998 and the lack of progress with UNMOVIC which has yet to commence its responsibilities in Iraq. There has been a disturbing lack of unanimity in the Security Council with the P5 members being split on how best to deal with Iraq. The fact that Iraq had developed significant chemical and biological weapons capabilities -- and had deployed these with predelegated authority to use these weapons in the Persian Gulf war of 1990-91 -- and has consistently refused to give up these capabilities seems to be forgotten by some members of the P5 giving a hollow ring to their commitment almost 10 years ago:

The proliferation of all weapons of mass destruction constitute a threat to international peace and security. The members of the Council commit themselves to working to prevent the spread of technology related to the research for or production of such weapons and to take appropriate action to that end. [Emphasis added]

It is shortsighted and foolish not to appreciate the danger posed to international security by biological weapons -- an attack in one country could easily spread to other countries through international travel and trade causing immense harm. There is a need for the P5 to recognize that there are strategic issues -- such as the proliferation of weapons of mass destruction -- which demand unanimity of purpose rather than promotion of purely national interests.

Prospects for the 21st Century

42. The 21st Century is one which holds incredible promise with biotechnology offering prospects of improved medical drugs and vaccines as well as genetically modified foods with increased yields and improved characteristics: such improved drugs and food offer the prospect of immense benefits to countries around the world and, in particular, to developing

³³A Draft Convention to Prohibit Biological and Chemical Weapons under International Criminal Law, CBW Conventions Bulletin, Issue No. 42, December 1998, pp.1-5.

³⁴See for example, US Arms Control and Disarmament Agency, *Threat Control Through Arms Control*, Annual Report to Congress 1998, 9 November 1999, p. 83.

countries. For countries to reap these benefits, they need to develop the biotechnological capabilities to produce these products safely and reproducibly in a way in which the public in those countries have confidence that the drugs and food will not have harmful side effects on either public health or the environment. This calls for countries to create the necessary infrastructure and standards for the safe use and handling of biotechnologically produced materials as well as meeting internationally agreed Good Manufacturing Practice standards in order to be able to sell these products in the international market.

43. Countries are increasingly concerned about how to maintain and improve public, animal and plant health as well as how to protect the natural environment and the resources resulting from biological diversity. The Convention on Biological Diversity opened for signature at the Rio Summit in June 1992 and entered into force in December 1993 states in Article 16 that access to and transfer of technology, including biotechnology, between States Parties is essential for the attainment of the objective of the Convention. It also in Article 19 "*Handling of Biotechnology and Distribution of its Benefits*" addresses both safety and transfer aspects with provisions for the States Parties to consider a protocol including, in particular, advance informed agreement in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology as well as to provide any available information on the use and safety regulations required in handling such organisms. The Cartagena Protocol on Biosafety with its provisions for advance informed agreement was finalized in January 2000.

44. It is thus evident that countries increasingly recognise that there are many dual-use materials -- such as pathogens that cause disease, toxins, narcotic drugs and psychotropic chemicals -- which need to be controlled and regulated to protect public health and the environment. The Protocol to strengthen the BTWC is a vital element to ensure that the deliberate use of disease to attack humans, animals or plants is totally prohibited and is complimentary to the initiatives being taken to promote human, animal and plant health as well as to maximize the benefits from biotechnology in achieving a safer, healthier, more prosperous world. National and international controls of the handling, use, storage and transfer of biological agents and toxins is needed for both health and security reasons. Preparedness needs to be available to counter natural outbreaks of disease -- and enable responses to be made to deliberate attacks whether caused by States or by non-State actors. And those who breach, or threaten to breach, the national and international prohibitions need to be met by a determined unanimous international response.