

# **Strengthening the Chemical Weapons Convention**

## **First CWC Review Conference Paper No 1**

### **Relevant Scientific and Technological Developments for the First CWC Review Conference: The BTWC Review Conference Experience**

**August 2002**

**Series Editors**

**Graham S Pearson and Malcolm R Dando**

Department of Peace Studies, University of Bradford

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# RELEVANT SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENTS FOR THE FIRST CWC REVIEW CONFERENCE: THE BTWC REVIEW CONFERENCE EXPERIENCE

by Graham S. Pearson

## Introduction

1. Paragraph 22 of Article VIII of the Chemical Weapons Convention states that:

*22. The Conference shall not later than one year after the expiry of the fifth and the tenth year after the entry into force of this Convention ... convene in special sessions to undertake reviews of the operation of this Convention. **Such reviews shall take into account any relevant scientific and technological developments.*** [Emphasis added]

The first such special session, referred to in this paper as the First Review Conference, is scheduled to commence on 28 April 2003.

2. As the Biological and Toxin Weapons Convention (BTWC) has been in force since 1975 and has had five Review Conferences at which it was necessary to "*take into account any new scientific and technological developments relevant to the Convention*" it is informative and useful in preparing for the First CWC Review Conference to consider the experience gained in this respect in the BTWC regime.

3. The relevant Article of the Biological and Toxin Weapons Convention<sup>1</sup> (BTWC) addressing the review of the Convention is Article XII which states that:

*Five years after the entry into force of this Convention, or earlier if it is requested by a majority of Parties to the Convention by submitting a proposal to this effect to the Depositary Governments, a conference of States Parties to the Convention shall be held at Geneva, Switzerland, to review the operation of the Convention, with a view to assuring that the purposes of the preamble and the provisions of the Convention, including the provisions concerning negotiations on chemical weapons, are being realized. **Such review shall take into account any new scientific and technological developments relevant to the Convention.*** [Emphasis added]

4. The requirement that the CWC Review Conference shall *take into account any relevant scientific and technological developments* and the closely similar requirement in the BTWC are not limited to any particular Article of the Convention. Consequently, Review Conferences should consider such developments in respect of **all** Articles of the Convention although particular attention can be expected to be given to such developments in regard to the basic prohibitions in the Convention.

## Scientific and Technological Developments Relevant to the Basic Prohibition

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<sup>1</sup>United 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. Available at <http://www.opbw.org>

5. This paper particularly considers the way in which relevant scientific and technological developments have been addressed in the context of the fundamental prohibition of the BTWC which is set out in Article I. This 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**; [Emphasis added]*

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

The text above in bold is the general purpose criterion which ensures that **all** biological agents and toxins, **past, present and future**, are embraced in the prohibition.

6. The comparable fundamental prohibition in the CWC is set out in Article I which states that:

*Each State Party to this Convention undertakes never under any circumstances:*

*(a) To develop, produce, otherwise acquire, stockpile or retain chemical weapons, or transfer, directly or indirectly, chemical weapons to anyone;*

*(b) To use chemical weapons;*

together with the key definitions in Article II: first, the definition of chemical weapons in paragraph 1 (a):

1. *"Chemical Weapons" means the following, together or separately:*

*(a) Toxic chemicals and their precursors, **except where intended for purposes not prohibited under this Convention, as long as the types and quantities are consistent with such purposes**; ... [Emphasis added]*

and then the definition of toxic chemicals in paragraph 2:

2. *"Toxic Chemical" means:*

*Any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals. This includes all such chemicals, regardless of their origin or of their method of production, and regardless of whether they are produced in facilities, in munitions or elsewhere.*

The text in paragraph 1 (a) above in bold is the general purpose criterion which ensures that **all** chemical agents, **past, present and future**, are embraced by the prohibition.

7. Both Conventions are similar in having all-embracing general purpose criteria -- and, consequently, the extended understandings developed in relation to the basic prohibition at successive BTWC Review Conferences are informative when considering what the First

CWC Review Conference might adopt in its Final Declaration. There is considerable relevance between the CWC and the BTWC for a number of reasons. First, there is a close relationship between chemical and biological weapons which is shown by the CBW spectrum:

Classical CW	Industrial Pharmaceutical Chemicals	Bioregulators Peptides	Toxins	Genetically Modified BW	Traditional BW
Cyanide Phosgene Mustard Nerve Agents	Aerosols	Substance P Neurokinin A	Saxitoxin Ricin Botulinum Toxin	Modified/ Tailored Bacteria Viruses	Bacteria Viruses Rickettsia  Anthrax Plague Tularemia
← Chemical Weapons Convention →		← Biological and Toxin Weapons Convention →			
← Poison →			← Infect →		

This shows that the two Conventions -- the CWC and the BTWC -- rightly overlap in the area of toxins as well as in the area of bioregulators and peptides with the CWC listing two toxins -- ricin and saxitoxin in Schedule 1. Furthermore, both Conventions address dual-use materials and technology, both totally prohibit a class of weapons which cause death or harm to humans and animals primarily through inhalation or ingestion, and both have general purpose criteria in their basic prohibition.

8. At successive BTWC Review Conferences, the language in the Final Declaration in Article I regarding scientific and technological developments has been developed.

9. Thus at the **First BTWC Review Conference** in 1980, the Final Declaration<sup>2</sup> in this respect in Article I simply stated that:

*The Conference believes that Article I has proved sufficiently comprehensive to have covered recent scientific and technological developments relevant to the Convention.*

Unlike all subsequent BTWC Review Conferences, no language was included in respect of the implications of scientific and technological developments in regard to either apprehensions about or the scope of the Convention.

10. By the **Second BTWC Review Conference** in 1986, the Final Declaration<sup>3</sup> contained stronger language and had developed into two paragraphs -- one addressing apprehensions:

<sup>2</sup>United Nations, *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*, 3 - 21 March 1980, Final Declaration, BWC/CONF.1/10, Geneva, 1980. Available at <http://www.opbw.org>

<sup>3</sup>United Nations, *Second 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*

*The Conference, conscious of apprehensions arising from relevant scientific and technological developments, inter alia, in the fields of **microbiology, genetic engineering and biotechnology**, 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]*

and the other making a clear reaffirmation as to the scope of the Convention:

*The Conference reaffirms that the Convention **unequivocally** applies to **all natural or artificially created** microbial or other biological agents or toxins **whatever their origin or method of production**. Consequently, toxins (both proteinaceous and non-proteinaceous) of a microbial, animal or vegetable nature and **their synthetically produced analogues** are covered. [Emphasis added]*

11. The first paragraph addressed apprehensions arising from developments *inter alia* in the fields of microbiology, genetic engineering and biotechnology and reaffirmed that the undertakings in Article I, the basic prohibition, applied to all such developments. The second paragraph addressing the scope has two sentences. The first sentence reaffirming that the Convention unequivocally applies to all natural or artificially created agents whatever their origin or method of production thereby emphasizing the all embracing scope of the Convention. The second sentence is an explanatory one that makes it clear that toxins of a microbial, animal or vegetable nature and their synthetically produced analogues are covered.

12. At the **Third BTWC Review Conference** in 1991 the Final Declaration<sup>4</sup> contained similar language, on this occasion combined into a single paragraph:

*The Conference, conscious of apprehensions arising from relevant scientific and technological developments, inter alia, in the fields of microbiology, genetic engineering and biotechnology, 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. The Conference also reaffirms that the Convention unequivocally covers all microbial agents or toxins, naturally or artificially created **or altered**, whatever their origin or method of production. [Emphasis added]*

The first sentence repeated the apprehensions addressed at the Second Review Conference using identical language referring to microbiology, genetic engineering and biotechnology. The second sentence reaffirmed the scope which was further extended by addition of the words "or altered".

13. At the **Fourth BTWC Review Conference** in 1996 the Final Declaration<sup>5</sup> was broadened, and again was in two paragraphs, one addressing apprehensions:

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*Destruction*, 8th - 26th September 1986, Final Declaration, BWC/CONF.II/13, Geneva, 1986. Available at <http://www.opbw.org>

<sup>4</sup>United 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 1991. Available at <http://www.opbw.org>

*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 application 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]*

and the other reaffirming the scope:

*The Conference also reaffirms that the Convention unequivocally covers all microbial or other biological agents or toxins, naturally or artificially created or altered, **as well as their components**, whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes. [Emphasis added]*

In the apprehensions paragraph, the developments to which the undertaking in Article I applied *inter alia* in the fields of *microbiology, biotechnology, molecular biology, genetic engineering and any application resulting from genome studies*, were broadened by the addition of *molecular biology* and of *any application resulting from genome studies*. The scope paragraph was also extended from that in 1986 by the addition of "*as well as their components*."

14. For the **Fifth BTWC Review Conference** which started on 19 November 2001 and was adjourned on 7 December 2001 until 11 November 2002, various proposals have been put forward for both the apprehensions and the scope paragraphs. One set of such proposals put forward by the Department of Peace Studies of the University of Bradford emerged from debate and discussions held at a NATO Advanced Research Workshop<sup>6</sup> entitled "New Scientific and Technological Developments of Relevance to the Biological and Toxin Weapons Convention" held in Prague on 31 May to 2 June 2001. This focussed on the consideration of **what advances might usefully be specifically referred to in the Final Declaration** of the Fifth Review Conference both in regard to the reaffirmation of the scope and in addressing apprehensions in order to ensure that there are no perceived omissions or exclusions which might be exploited in a way that is inconsistent with the objectives and purposes of the Convention.

15. During the Workshop, there was a shared recognition among the participants that the language relating to scientific and technological developments in Article I in the Final Declarations of previous Review Conferences had hitherto comprised **a reaffirmation of the scope** sometimes together with an **explanatory sentence** and an **apprehensions paragraph** with its listing following the words *inter alia* of particular broad areas. Initial ideas at the Workshop began with consideration of an extension of the listing of areas in the

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<sup>5</sup>United Nations, *The Fourth 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, 25 November - 6 December 1996, BWC/CONF.IV/9, Geneva 1996. Available at <http://www.opbw.org>

<sup>6</sup>A personal report of this NATO Advanced Research Workshop is available as Graham S. Pearson, *New Scientific and Technological Developments of Relevance to the Fifth Review Conference*. Review Conference Paper No. 3, Department of Peace Studies, University of Bradford, July 2001. Available at <http://www.brad.ac.uk/acad/sbtwc>

apprehensions paragraph which started from that in the Final Declaration of the Fourth Review Conference:

*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 application 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.*

and which was, during the Workshop, conceptually gradually extended by additional terms:

*The Conference, conscious of apprehensions arising from relevant scientific and technological developments, inter alia, in the fields of microbiology, biotechnology, molecular biology, genetic engineering, neuroscience, bioinformatics and databases, and any application resulting from genome and proteome studies and derived techniques, and biological control in animals and plants as well as humans, 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.*

This led to the appreciation that an ever longer listing could be impracticable. It consequently would be preferable to use a broader term "**life sciences**" in the apprehensions paragraph which could be accompanied by an explanatory sentence concerning particular recent developments. In addition, it was recognized that the emphasis in the previous Final Declarations had tended to ignore concerns relating to animals and plants. It was consequently felt that there would be benefits from inclusion of specific language to make it clear that the scientific and technological developments that could be of concern apply to **animals and plants as well as to human beings**:

*The Conference, conscious of apprehensions arising from relevant scientific and technological developments, inter alia, in the life sciences in animals and plants as well as humans, 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. **Consequently, biological control, genomics, proteomics, bioinformatics and databases and their applications are covered.***

16. Insofar as the reaffirmation of the scope paragraph in Article I in the Final Declaration was concerned, it was considered that this could usefully build upon that adopted at the Fourth Review Conference together with an explanatory sentence as at the Second Review Conference to read as follows:

*The Conference also reaffirms that the Convention unequivocally covers all microbial or other biological agents or toxins, naturally or artificially created or altered, as well as their components, whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes. **Consequently, prions, proteins and bioregulators and their synthetically produced analogues and components are covered.***

The explanatory sentence would make it clear that certain developments were included:



*Consequently, biological control, genomics, proteomics, bioinformatics and databases and their applications are covered.*

This additional sentence would eliminate any doubt as to the scope of the Convention in covering these rapidly developing fields of the life sciences.

17. These developments at successive BTWC Review Conferences can usefully be summarised, thereby showing the developments in the language in the Article I section of the Final Declarations, as follows for the scope:

Convention (Article I)	<i>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;</i>
First Rev Con	<i>The Conference believes that Article I has proved sufficiently comprehensive to have covered recent scientific and technological developments relevant to the Convention.</i>
Second Rev Con	<i>... the Convention unequivocally applies to all natural or artificially created microbial or other biological agents or toxins whatever their origin or method of production.</i>
Third Rev Con	<i>... the Convention unequivocally covers all microbial agents or toxins, naturally or artificially created or altered, whatever their origin or method of production.</i>
Fourth Rev Con	<i>... the Convention unequivocally covers all microbial or other biological agents or toxins, naturally or artificially created or altered, as well as their components, whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes.</i>

whilst in regard to the apprehensions:

Convention	<i>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;</i>
First Rev Con	<i>The Conference believes that Article I has proved sufficiently comprehensive to have covered recent scientific and technological developments relevant to the Convention.</i>
Second Rev Con	<i>... apprehensions arising from relevant scientific and technological developments, <u>inter alia</u>, in the fields of microbiology, genetic engineering and biotechnology,</i>
Third Rev Con	<i>... apprehensions arising from relevant scientific and technological developments, <u>inter alia</u>, in the fields of microbiology, genetic engineering and biotechnology,</i>
Fourth Rev Con	<i>... apprehensions arising from relevant scientific and technological developments, <u>inter alia</u>, in the fields of microbiology, biotechnology, molecular biology, genetic engineering and any application resulting from genome studies,</i>

## **The Process used to Address Scientific and Technological Developments**

18. In considering how relevant scientific and technological developments may be taken into account at the First CWC Review Conference, it is worth taking note of the process which has been used at the BTWC Review Conferences to address relevant scientific and technological developments.

19. **Background Papers on Relevant Scientific and Technological Developments.** The Preparatory Committee for the First BTWC Review Conference met in July 1979 and decided<sup>7</sup> to request the Depositary Governments to prepare a background paper on new scientific and technological developments relevant to the Convention, and to request the Secretary of the Committee to invite the comments of States Parties concerning that paper. The Committee further decided to invite States Parties who wished to do so to submit their views on new scientific and technological developments relevant to the Convention. Finally, the Committee decided to request the Secretary of the Committee to compile the comments of States Parties on the paper prepared by the Depositary Governments, together with national contributions on that subject. This resulted in a background paper (BWC/CONF.I/5) submitted by the Depositary Governments on the scientific and technological developments relevant to the Convention together with a paper (BWC/CONF.I/6) entitled "*Views of States Parties on new scientific and technological developments relevant to the Convention.*"

20. For subsequent BTWC Review Conferences, the Preparatory Committee has, as in 2001, "*also decided to invite States Parties that wished to do so, including the Depositary Governments, to submit to the Secretariat information on new scientific and technological developments relevant to the Convention. This information should cover the applications being made of such developments and their relevance to the various aspects of the Convention.*"<sup>8</sup> The due date for the circulation of background documentation was decided by the Preparatory Committee as being "*not later than four weeks before the opening of the Conference.*" In practice, background documentation is circulated when it is received which may be as late as during the Review Conference.

21. For the First CWC Review Conference it is understood that background papers are being prepared by the Technical Secretariat and that the Scientific Advisory Board are considering the relevant scientific and technological developments. It would, however, be highly desirable that the States Parties to the CWC be invited to submit national background papers on relevant scientific and technological developments and that these should, as in the comparable BTWC Preparatory Committee invitations, "*cover the applications being made of such developments and their relevance to the various aspects of the Convention.*" An appropriate date by which such background papers should be submitted to and circulated by the Technical Secretariat should be specified. Ideally this should be about three months prior to the Review Conference to enable States Parties to review and consider them.

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<sup>7</sup>United Nations, *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*, 3 - 21 March 1980, Organization and Work of the Review Conference, BWC/CONF.1/10, Geneva, 1980, p.2, para 8. Available at <http://www.opbw.org>

<sup>8</sup>United Nations, *Report of the Preparatory Committee for the Fifth 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*, BWC/CONF.V/PC/1, 1 May 2001, p.4, para 22. Available at <http://www.opbw.org>

22.. For the Fourth BTWC Review Conference in 1996, seven States Parties submitted background scientific and technological development papers<sup>9</sup>, which varied in length and scope:

- a. **Cuba** provided three pages of information on the work carried out by nine Cuban centres or laboratories
- b. **Finland** provided a line saying that "she had not made any scientific and technological developments relevant to the Convention."
- c. **Switzerland** provided two pages noting that biotechnology and genetchnology had revolutionized (and is still doing so) many areas of biological and medical sciences and outlining the developments in recombinant DNA and monoclonal antibodies as well as in biological toxins.
- d. **The United Kingdom** provided 11 pages which provided a comprehensive appraisal of the developments of relevance to the BTWC. Separate sections addressed detection technologies, genetic developments, vaccines, trends in infectious diseases and their treatment, industrial microbiology and microbial control of pests.
- e. **The United States of America** provided 8 pages which provided a review of the technological developments of relevance to the BTWC. A section on advances in industrial application of biotechnology included sections on modified microorganisms (with subsections on toxins, peptides), and advances in production (with subsections on mammalian cell culture, continuous flow fermenters, hollow-technology fibre and safety and environmental standards). A section on advances in analytical and vaccine technology included sections on developments in assay technology and DNA vaccines. Another section addressed other technological advances including phage libraries and information networks whilst a further section on outbreaks of infectious disease included AIDS and Ebola virus.
- f. **Sweden** provided 6 pages which provided an overview of developments of relevance to the Convention. Separate sections addressed disease causing mechanisms, large-scale production, release of genetically modified microorganisms in the environment, new antibacterial and antiviral agents, vaccines, and identification, diagnosis and detection.
- g. **Germany** provided a page on scientific and technical progress in providing protection from biological weapons.

Some of these background papers on scientific and technological developments include value judgements whilst others do not. The inclusion of value judgements about the significance of the scientific and technological developments to the BTWC are beneficial as they help to better inform other States Parties. It should, however, be noted that there is correctly no linkage between the information provided in the background scientific and technological development papers and the Final Declaration of the BTWC Review Conference. The

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<sup>9</sup>These background papers are available in United Nations, *Background Paper on New Scientific and Technological Developments relevant to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction*, BWC/CONF.IV/4, Add.1 and Add.2. Available at <http://www.opbw.org>

background scientific and technological development papers do, however, inform both the States Parties who consult together in putting forward proposals for language for inclusion in the Final Declaration as well as the States Parties who negotiate and agree the language in the Final Declaration.

23. For the Fifth BTWC Review Conference, five States Parties submitted background scientific and technological development papers<sup>10</sup>, which again varied in length and scope:

a. **Bulgaria** provided a page on the work of the National Centre for Infectious and parasitic Diseases and on the Bulgarian Academy of Sciences.

b. **South Africa** provided six pages on scientific and technological developments relating to biocontrol agents and plant inoculants.

c. **Sweden** provided five pages noting that development in the field of biotechnology continued to be fast and innovative especially in the field of medicine. Separate sections addressed genomics, proteomics and treatment of disease; vaccines; industrial microbiology and production; and identification of disease causing agents.

d. **United Kingdom** provided 28 pages noting that it was considered important to review "progress in genetics knowledge and applications relating to micro-organisms, toxins and infectious disease, which amounts to an explosion of achievement and potential since the 1996 Review Conference." An Annex is provided with sections on genomics and proteomics; bioinformatics; human genome project and human diversity; gene therapy; virulence and pathogenicity; vaccines and novel therapies; recombinant protein expression; toxins and other bioactive molecules; detection and identification technologies; human infectious disease patterns; smallpox destruction; drug resistance; disease in agriculture; pest control in agriculture; global initiative to tackle disease; molecular biology applications and crops; trends in protein production technologies; international cooperation and biosafety: activities under the Biodiversity Convention; means of delivery of agents or toxins; use of pathogens to control weeds and 'criminal' crops; bioremediation: the destruction of materiel; countering the threat of bioterrorism; and the impact of entry into force of the CWC.

e. **United States** provided ten pages noting that the pace of advances in biotechnology will increase. Separate sections are provided on biocontrol agents; bioremediation; natural attenuation; environmental modification; bioaugmentation; vaccines; vaccine delivery systems; viral tropisms; bioinformatics; microbial genomics; toxicogenomics; proteomics; DNA shuffling; DNA microarrays; outbreaks of infectious diseases; prion diseases; foot and mouth disease; and West Nile Fever virus.

As at previous Review Conferences, some of these background papers on scientific and technological developments include value judgements whilst others do not.

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<sup>10</sup>These background papers are available in United Nations, *Background Paper on New Scientific and Technological Developments relevant to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction*, BWC/CONF.V/4 and Add.1. Available at <http://www.opbw.org>

24. At the BTWC Review Conferences, the States Parties engaged in the Review Conference submit proposals to the Committee of the Whole for language to be incorporated into the Final Declaration. Some of these proposals relate to the relevant scientific and technological developments in regard to Article I. Thus at the Fourth BTWC Review Conference proposals<sup>11</sup> were put forward in the Committee of the Whole for the Article I section of the Final Declaration by:

a. **Chile** who proposed:

*The Conference also reaffirms that the Convention unequivocally covers all microbial and other biological agents or toxins, naturally or artificially created or altered, whatever their origin or method of production, as well as chemical components and products of living organisms and their analogs and modified derivatives, whether isolated, synthesized, cloned or produced by any combination or means, with a capacity for generating potentially adverse physiological effects.*

b. **United States** who proposed language identical to that in the Final Declaration of the previous (Third) Review Conference:

*The Conference, conscious of apprehensions arising from relevant scientific and technological developments, inter alia, in the fields of microbiology, genetic engineering and biotechnology, 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. The Conference also reaffirms that the Convention unequivocally covers all microbial agents or toxins, naturally or artificially created or altered, whatever their origin or method of production.*

25. As already noted above, the eventually agreed Final Declaration contained two paragraphs:

*The Conference also reaffirms that the Convention unequivocally covers all microbial or other biological agents or toxins, naturally or artificially created or altered, as well as their components, whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes.*

*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 application 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.*

These had been developed from the proposals put to the Committee of the Whole.

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<sup>11</sup>United Nations, *The Fourth 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, 25 November - 6 December 1996, BWC/CONF.IV/9, Geneva 1996, Part III, pp. 41 -43.

## The First Review Conference of the CWC

26. Although the outcome of the First CWC Review Conference is not yet determined, there is much to be said for a Final Declaration agreed by the States Parties being the outcome of the First Review Conference. Such a Final Declaration would parallel the outcome of other Conventions such as the BTWC and the Nuclear Non-Proliferation Treaty and would enable the CWC regime to benefit from the extended understandings that arise from such Final Declarations. It is understood<sup>12</sup> that the open-ended Working Group on the preparations for the Review Conference has selected some nine themes or clusters of issues to form the framework of the review process which include:

- General issues, including emerging challenges such as chemical terrorism and universality, and
- Impact of scientific and technological developments on the basic provisions of the Convention.

It is therefore probable that the Final Declaration of the First CWC Review Conference will include language that addresses the implications of relevant scientific and technological developments on the basic prohibitions of the Convention.

27. As already noted above, the key elements of Article II in this respect are the definition of chemical weapons in paragraph 1 (a):

1. *"Chemical Weapons" means the following, together or separately:*

*(a) Toxic chemicals and their precursors, **except where intended for purposes not prohibited under this Convention, as long as the types and quantities are consistent with such purposes;** ... [Emphasis added]*

and the definition of toxic chemicals in paragraph 2:

2. *"Toxic Chemical" means:*

*Any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals. This includes all such chemicals, regardless of their origin or of their method of production, and regardless of whether they are produced in facilities, in munitions or elsewhere.*

28. In the light of the experience gained at the BTWC Review Conferences, it is evident that the Final Declaration of the First CWC Review Conference could -- and, it is to be hoped, should -- reaffirm that the definition of toxic chemicals is all embracing underlining the inclusion of **any chemical which can cause death, temporary incapacitation or permanent harm to humans or animals** and that this includes **all such chemicals**,

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<sup>12</sup>See Pamela Mills, *Developments in the Organization for the Prohibition of Chemical Weapons, Progress in The Hague, Quarterly Review no 37*, CBW Conventions Bulletin, Issue No. 55, March 2002 and Pamela Mills, *The First Review Process of the Chemical Weapons Convention, an Update*, Working Paper for Pugwash meeting no. 270, 17th CBW Workshop, *The Impending First CWC Review*, Oegstgeest, The Netherlands, 15 - 16 June 2002.

**regardless of their origin or of their method of production, and regardless of whether they are produced in facilities, in munitions or elsewhere.**

29. Given the immense developments during the last few years in the identification and evaluation of new chemicals using techniques such as combinatorial chemistry, supported synthesis, proteomics and genomics together with chemo-informatics as well as in new methods for the synthesis and production of both known and new chemicals using techniques such as automated process control and mini/micro reactors, there would be benefits in the Final Declaration of the First CWC Review Conference including an apprehensions paragraph which could be along the following lines, where the words in bold would need to be negotiated:

*The Conference, conscious of apprehensions arising from relevant scientific and technological developments, inter alia, in the fields of **chemistry, combinatorial synthesis, biological synthesis, chemoinformatics and in applications such as microreactors and automated process control** 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.*

30. In addition, there would be benefits in the Final Declaration of the First CWC Review Conference including a reaffirmation paragraph which could be along the following lines, where the words in bold would need to be negotiated:

*The Conference also reaffirms that the Convention unequivocally covers all chemicals, regardless of their origin or of their method of production and regardless of whether they are produced in facilities, in munitions or elsewhere, of types and in quantities that are consistent with purposes not prohibited under this Convention.*

In order to prevent any possible misperception that the CWC and the BTWC overlap in regard to prohibition of toxins, bioregulators and peptides, there could be advantage in also adding an explanatory sentence along the following lines:

*Consequently, **toxins, prions, proteins, peptides and bioregulators and their biologically or synthetically produced analogues and components** are covered.*

## **Conclusions**

31. This paper has considered the First CWC Review Conference in regard to the implications of relevant scientific and technological developments on the basic prohibitions of the CWC by examining the experience of the Review Conferences of the Biological and Toxin Weapons Convention in regard to the consideration of relevant scientific and technological developments. The Final Declarations of the BTWC Review Conferences have provided shared extended understandings which have usefully reaffirmed the comprehensiveness of the basic prohibition in Article I of the BTWC. It is recommended that the States Parties to the CWC should be invited to submit background papers on relevant scientific and technological developments which should cover the applications being made of such developments and their relevance to the various aspects of the Convention as such papers can inform both the States Parties who consult together in putting forward proposals for language for inclusion in the Final Declaration as well as the States Parties who negotiate and agree the language in the Final Declaration. Such background papers by States Parties

or by the Scientific Advisory Board should be posted as they are received by the OPCW Technical Secretariat on the Review Conference page at the opcw.org website in order to facilitate their consideration by all preparing for the First CWC Review Conference.

32. The States Parties to the CWC are recommended in the Final Declaration of the First CWC Review Conference to follow a similar approach to that followed in the Final Declarations of the BTWC Review Conferences as such extended understandings significantly strengthen the regime. They are urged to go beyond the somewhat timid statement of the First BTWC Review Conference which simply stated that:

*The Conference believes that Article I has proved sufficiently comprehensive to have covered recent scientific and technological developments relevant to the Convention.*

and to take the opportunity to reaffirm the comprehensiveness of the basic prohibition of the CWC in Articles I and II.