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CHEMICAL WEAPONS IN THE TWENTIETH CENTURY THEIR USE AND THEIR CONTROL

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Introduction

The Twentieth Century¹ has seen the development of progressively more deadly chemical weapons. It has seen their use with significant effect in a World War and in regional conflict and the first instances of their use by terrorists. Several attempts have been made to regulate their use through international legal instruments. The most recent of these, the Chemical Weapons Convention (CWC), which came into force in April 1997, gives cause for confidence that this particular scourge can be controlled but the task is not complete.

This paper attempts to give a reasonably complete overview of the subject without entering into detail of only specialist interest. After a brief description of the weapons themselves and their modes of action it examines military and political developments divided into two periods: from the beginning of the century up to the end of the Second World War and from 1946 to the end of the century, including completion of negotiation of the CWC in 1992. It then describes in some detail the provisions of the Convention together with the reasons why some of them were shaped in

a particular way by the negotiators in Geneva. Finally, a few paragraphs on the work of the Preparatory Commission and the first two years of operation of OPCW lead to the conclusion that a great deal has been achieved but that some important loose ends are yet to be tied if mankind is truly to be protected from this particular, ugly weapon system.

*The Nature of Chemical Weapons*²

The Chemical Weapons Convention extends to “any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals”.³ The weapons which have been used on the battlefield or included in major military stockpiles in the Twentieth Century include **harassing agents**, *lachrymators* (tear gases), and *sternutators* (causing sneezing); and **casualty agents**, *lung irritants*, *blood agents*, *vesicants* (blister agents), *nerve agents* and *psychochemicals*. Harassing agents are intended to reduce the effectiveness of the enemy by forcing them to put on masks or to oblige unprotected troops to evacuate closed spaces such as bunkers. The effects typically wear off in a short time after exposure to the agent ceases but high dosages can cause death or longer term injury.⁴ Casualty agents are intended to kill or produce longer term incapacitation. Short term death rates have been around ten per cent of total casualties, varying from death in a matter of minutes from lethal doses of nerve

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agent to days for phosgene or mustard gas. Many casualties, whilst making an adequate recovery in the military sense, are left with serious long term problems such as chronic bronchitis or susceptibility to cancer.

Lachrymators A wide range of chemical substances were used as lachrymators in the First World War of which the largest use was made of *bromoacetone*. Towards the end of the conflict more potent agents were discovered: α -*bromobenzyl cyanide* (CA) and ω -*chloroacetophenone* (CN). In the second half of the century the lachrymator of choice for both military use and for domestic riot control has been *2-chlorobenzalmalonitrile* (CS).

Sternutators A group of arsenical substances of great irritancy were introduced in 1917. These are solid at ambient temperatures and, like CN and CS, need to be dispersed as aerosols to have full effect. These included *diphenylchloroarsine* (DA) and *10-chloro-5,10-dihydrophenarsazine* (DM or Adamsite)

Lung irritants The first casualty agent used on a large scale was *chlorine*, dispersed in clouds from cylinders. This acts by destroying the lining of the lungs and causes death by asphyxiation. *Phosgene* was then found to be more effective and, in the form of *diphosgene*, could be delivered effectively by artillery.⁵

Blood agents These act by blocking the ability of the blood to carry oxygen. The principal substance used in this way in 1916 was *hydrogen cyanide*. On the battlefield its toxicity is offset by its low vapour density which makes it difficult to achieve lethal dosages at the point of action.

Vesicants 1917 saw the first use of *bis-(2-chloroethyl) sulphide* (mustard gas or Yperite). This has three important areas of action on the human body:- the skin, where it causes large and painful blisters which are slow to heal; the eyes, where it causes severe conjunctivitis, leading to temporary blindness; and the lungs, where it causes severe damage to the lining, frequently fatal or leading to long term ill-effects. Similar effects are available from the arsenical vesicant *2-chlorovinylchloroarsine* (Lewisite). Mustard gas and its variants have remained an important component of chemical arsenals up to the present day.

Nerve agents Research in Germany in the late 1930s into insecticides led to the discovery of a class of highly toxic chemicals which block the action of the enzyme *acetylcholine esterase*, essential to the transmission of signals through the nerves. These agents can enter the body either through inhalation (vapour or aerosol) or through the skin (liquid droplets). Agents include *ethyl NN-dimethylphosphoramidocyanidate* (Tabun), *O-isopropyl methylphosphonofluoridate* (Sarin), *O-pinacolyl methylphosphonofluoridate* (Soman) and the even more toxic *O-ethyl S-2-diisopropylaminoethylmethylphosphonothiolate* (VX).

Psychochemicals Another concept which has been explored is chemicals designed to produce temporary incapacitation through action on the central nervous system.

3-Quinuclidinyl benzilate (BZ) has been weaponised and stockpiled but there is no conclusive evidence of its use on the battlefield.

Toxins and bioregulators⁶ Toxins are chemicals produced by biological processes (but capable of being produced by chemical synthesis) which have a very high toxicity. Of those which have been considered as weapons *ricin* occurs in castor beans, *saxitoxin* in algae (sometimes resulting in lethal contamination of shellfish) and *botulinum toxin* is produced by bacteria. Bioregulators are substances used naturally by the body to turn necessary bodily functions on and off.

Binary Weapons Until the 1980s chemical warfare agents were made in chemical factories, stored in bulk containers (typically of one ton capacity) or as filled munitions, and transported to the battlefield as munitions. This resulted in the storage and transport of highly toxic substances, prone to leak out of their containers and very difficult and expensive to destroy safely⁷ if not required for use in war. These problems are partly overcome in the binary concept, where two less toxic precursors are transported in separate containers which are inserted in the munition at an appropriate stage and mixed within the warhead on its way to the target.⁸

History

Until 1945

Enthusiasts for the subject cite examples back two millennia and more of the fumes of burning sulphur and noxious smokes being used in warfare. However it was the rise of the modern chemical industry at the end of the nineteenth century which first made feasible the use of significant quantities of toxic chemicals on large scale battlefields. The end of the century also saw an attempt to keep the genie in the bottle when the 1899 Hague Peace Conference adopted its Declaration (IV,2) which banned “the use of projectiles the sole object of which is the diffusion of asphyxiating or deleterious gases”.

The use of chlorine gas released from cylinders in the Ypres salient in April 1915 was not technically a breach of this legal instrument as projectiles were not involved but all the combatants in the 1914–18 conflict soon realised the advantages of projectors,⁹ mortars and artillery for the delivery of chemical agents to the target and seem to have set aside any legal scruples. Over a million casualties, up to 100,000 of them fatal, are estimated to have been caused by chemicals during the conflict, a large part following the introduction of mustard gas in 1917.

After an unsuccessful attempt in Washington in 1921–22 to ban both chemical weapons and submarines, the League of Nations took up the matter of the control of chemical (and biological) weapons. The result was the 1925 Geneva Protocol — the *Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare* — which opened for signature on 17 June 1925 and entered into force on 8 February 1928. Unfortunately, many of the major

powers entered reservations under which they retained the right to use chemical weapons against an adversary who initiated their use or against non-parties to the Protocol.¹⁰ Whilst China, France, the United Kingdom and the USSR all became parties in the 1920s, the United States Administration was unable to obtain assent from the Senate to ratification until 1975.

Following the acceptance of the Protocol, the 1930s saw only two conflicts in which major use was made of chemical weapons — by Italy in Ethiopia in 1935–40 and by Japan in China from 1937 onward. Apart from the Sino–Japanese conflict the Second World War did not see other than minor (and probably unauthorised) use of chemical warfare by any of the belligerents, despite the production and deployment of very large stockpiles of different agents, most of which were dumped at sea when the war ended. The reasons for this lack of use appear to be primarily fear of retaliation in kind, particularly against inadequately protected civilian populations. Both President Roosevelt and Hitler are known to have been personally averse to first use. It is probably also the case that the chemical weapons available did not fit well in a military doctrine based on rapid movement and use of armour and would have taken up space in transport which the military preferred to use for high explosive.

1946–1999

Military aspects Despite this experience and also despite their primary reliance on nuclear weapons to deter each other from the initiation of armed conflict, during the Cold War both the USSR and the United States built up large stockpiles of chemical weapons,¹¹ both nerve agents and vesicants. At the end of the Cold War period they retained stocks amounting to 40,000 and 29,000 agent tonnes respectively, according to official public statements made during later stages of the CWC negotiations. The armed forces of NATO and the Warsaw Pact each maintained a high state of training and physical preparedness for chemical defence but a lower level of civil defence, suggesting that chemicals were seen at that time as principally a battle-field weapon.

Meanwhile, outside the main East–West confrontation it has been claimed that up to twenty states were taking a serious interest in acquiring a chemical weapon capability. These included South Africa, much of the Middle East and North Africa, South Asia, China and the Koreas. Concern about this level of proliferation led to cooperation in export control of key precursor¹² chemicals among the industrialised countries through the “Australia Group”.¹³

The use of chemical weapons in conflict in the second half of the century has been very limited. There have been occasional reports of small-scale use in counter-insurgency and civil war situations, mostly poorly substantiated, of which the clearest case was in Yemen 1963–67. The USA has been accused of using chemicals in the Vietnam War but, aside from herbicides, which fall outside our definition, it seems clear that their use was limited to harassing agents, almost entirely CS. Chemical weapons, both nerve agents and mustard, were used to significant effect in the Iran–Iraq War from 1983 to the cease-fire in 1988. Iraqi success in

using these weapons was in part due to the inability of Iran to supply more than a small proportion of its front line troops with modern protective equipment.

After the cease-fire Iraq continued to use lethal chemical agents against its own Kurdish population. Pictures of the massacre at Halabja played an important role in building public support for an effective chemical weapons ban.

Following the 1991 Gulf War the UN Special Commission (UNSCOM), established to eliminate Iraq’s programmes for the production of weapons of mass destruction, located and destroyed 690 agent tonnes of vesicants and nerve agents, including mustard gas and Sarin, together with over 3,000 tonnes of essential raw materials.

A problem relating to the potential use of chemical weapons by terrorists, which had long been feared, became

References and Notes

1. For the purposes of this article, the Twentieth Century is taken to have ended on 31 December 1999 and all data and statistics in this article relate to this date, unless otherwise noted. Updates of many of the figures in this article are provided regularly in *The CBW Conventions Bulletin*.
2. For a fuller treatment of the nature of chemical warfare agents and their medical aspects the reader is referred to “Health aspects of chemical and biological weapons” a World Health Organization Report.
3. Herbicides are not specifically covered but the Preamble recognises “the prohibition embodied ... in international law, of the use of herbicides as a method of warfare”.
4. Some agents used in the First World War as harassing agents had a high toxicity and the distinction from casualty agents was more blurred than it has been in more modern doctrine.
5. A most effective means of delivery was the “projector”, a primitive mortar, capable of throwing a container of 15kg of agent a distance of 1500m, used in groups of several hundred fired simultaneously by electricity.
6. Development of weapons relying on toxins, however produced, would be a breach of both the BWC and CWC.
7. The difficulty and expense of destruction have increased dramatically in recent years with the rise in environmental protection standards.
8. Iraq devised a simpler but much more hazardous procedure in which the two precursors were to be separately poured into Scud missile warheads by the artillerymen immediately before launch.
9. A primitive form of mortar, massed in hundreds and fired simultaneously by electric detonation.
10. Many of these reservations were withdrawn at the time of negotiation of the CWC.
11. The United Kingdom stockpile is reported to have reached 60,000 agent tonnes by the end of the Second World War but was disposed of in the 1960s and 70s. This was two-thirds mustard gas with the balance phosgene and tear gas. This figure includes 7000 tonnes of German Tabun which was held for a short time in the UK but then dumped in the North Atlantic. Domestic nerve gas production never went beyond the pilot plant stage in the UK and even the pilot plant had been destroyed by the time CWC negotiations started in the 1980s.
12. Precursors are chemicals from which chemical weapon agents can be synthesised.
13. So called because its first meeting took place in the Australian Embassy in Brussels.

manifest in June 1994 when seven people died and more than 200 were injured in Matsumoto, Japan as a result of a release of the nerve agent Sarin. This received little publicity outside Japan at the time but the world took notice when the group responsible, a religious cult called Aum Shinrikyo, went on to release Sarin on the Tokyo subway system on 20 March 1995, resulting in 12 deaths, 122 serious injuries and 4695 attending hospital for gas exposure.¹⁴

On 20 August 1998 the Al-Shifa Pharmaceutical Industries factory in Khartoum North in the Sudan was destroyed by cruise missiles launched from United States warships in the Red Sea. This attack, part of the US response to bombings of its embassies in Kenya and Tanzania, was justified by US officials on the ground that they had “physical evidence that they were making a chemical which was essentially one step removed from VX”. Subsequently, considerable doubt was cast on the quality of that evidence. The Sudanese Government denied that the factory had any involvement with chemical weapons. After requesting unsuccessfully that the UN Security Council send experts to investigate the matter on the ground, Sudan moved to demonstrate its bona fides by acceding to the Chemical Weapons Convention on 24 May 1999.

Disarmament Negotiations In 1954 when the Federal Republic of Germany adhered to the 1948 Brussels Treaty which had created the Western European Union it accepted, through Protocol III, a ban on the production of “atomic, biological and chemical weapons” and “agree[d] to supervision by the competent authority of the Brussels Treaty Organisation to ensure that these undertakings are observed”. The Austrian Treaty of 1955 contains similar prohibitions but without the verification clause.

Disarmament discussions in the first twenty years after the formation of the United Nations were concentrated on nuclear weapons and proposals for ‘general and complete disarmament’, the latter subsuming issues related to chemical and biological weapons. The late 1960s saw an increase in concern regarding chemical and biological weapons, partly as a response to the use of herbicides and tear gas by the United States in Vietnam. The matter was raised at the UN General Assembly in 1966 and accepted as an agenda item by the disarmament conference in Geneva (at that date the ENDC) in 1968. In 1969 the UN Secretary-General issued a Report on *Chemical and Bacteriological (Biological) Weapons and the Effects of Their Possible Use* which was followed in 1970 by the WHO Report *Health Aspects of Chemical and Biological Weapons*.

In 1968 the United Kingdom proposed that the issues of chemical and biological weapons be treated separately and offered a draft Biological Weapons Convention (BWC) in 1969. After some initial reluctance, this approach was adopted, the CCD (successor to ENDC) completed the work and the BWC was opened for signature in April 1972, entering into force in March 1975. Two factors were important in this process; the announcement by the United States in 1969 of the renunciation of biological weapons¹⁵ and the destruction of its stockpile; and the view, held at that time but since discarded, that a biological weapons ban could be satisfactory without elaborate provisions for verification. The BWC is designed to complement the Geneva

Protocol in that the prohibition of *use* is left to the Protocol while the BWC requires each party:

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.

This was to provide an important starting point for discussion of scope of a CWC. The inclusion of toxins, “whatever their origin”, brings a whole class of chemicals under the provisions of the BWC. As these chemicals were also to fall within the scope of the eventual CWC they provide an area of overlapping coverage of the two Conventions.

As a concession to those who were concerned about the separation of CWC and BWC the latter contains an Article (IX) which obliges the parties to:

continue negotiations [on chemical weapons] in good faith with a view to reaching early agreement on effective measures for the prohibition of their development, production and stockpiling and for their destruction, and on appropriate measures concerning equipment and means of delivery specially designed for the production or use of chemical agents for weapons purposes.

It was to be another twenty years before this ambition was to be realised.

Although the CCD never established a formal negotiating group to address the chemical weapons problem it received some 60 working papers from delegations on the subject over the period 1972–78, including draft conventions from the USSR and its allies (1972, simply adapting the BWC text to form a CWC), from Japan (1974, proposing a step-wise approach on scope) and from the United Kingdom (1976, proposing declarations on signature and a strong verification system). The main obstacle to progress at this period was the diametrically opposed views on the subject of intrusive, on-site verification systems; rejected totally by the Eastern Group and strongly demanded by the West with the Neutral and Non-Aligned Group proposing a declaration based system. However many ideas put on the table at this stage were to play an important role later.

In July 1974 the United States and the USSR announced that they were entering into bilateral consultations with a view to a ‘joint initiative’ on chemical weapons.¹⁶ The significance of this was that most of the finished legal instruments produced by the Geneva negotiating fora to that date had been produced on the basis of US–USSR joint drafts. The bilaterals ended in July 1980 without producing the promised initiative but were none the less important in that many of the key provisions of the eventual CWC were agreed between the two principal possessor states during this process — the use of declarations; precursor control; Consultative Committee plus Technical Secretariat; 10-year destruction period; Single Small-Scale Facility; and verification by challenge using on-site inspection, albeit voluntary.

Meanwhile the 1978 UN Special Session on Disarmament had overhauled the Geneva machinery, expanding the membership¹⁷ and improving the working methods. The CD,¹⁸ as it was now known, established an Ad Hoc Working Group on Chemical Weapons in 1980. This was upgraded to an Ad Hoc Committee in 1984 with a mandate to negotiate the text of a draft CWC.

In March 1984 the UN Secretary-General issued a Report confirming the use of lethal chemicals, both mustard gas and nerve agent, in the war between Iraq and Iran. This reemergence of lethal chemical weapons on a large scale on the battlefield produced a new sense of urgency in attempts to agree a ban. In April 1984 then Vice-President Bush of the United States introduced a working paper (CD/500) containing the text of a draft CWC incorporating many of the elements which were to be present in the final text as adopted in 1992. Important among these was the concept of short notice challenge inspections (although restricted to government owned or controlled facilities).

Negotiations continued on the basis of a “rolling text”, first introduced at the end of the 1983 session, which contained three elements: “clean text”, which represented areas of agreement already achieved; alternative proposals, within square brackets, for text not yet agreed; and footnotes and appendices indicating concerns which had not been elaborated as treaty text language.

In January 1989, the French Government, Depositary of the Geneva Protocol, hosted a high level meeting in Paris to reaffirm the Protocol and to provide political impetus to the work of the CD on the CWC. 149 states’ representatives adopted a strong Final Declaration calling for expeditious conclusion of the Convention and calling upon all states to become parties as soon as it was concluded.

The negotiators realised the importance of engaging the chemical industry in the process of elaborating the CWC, both to ensure political endorsement and to allow their particular concerns, especially regarding confidential business information, to be addressed. In addition to each delegations’ own contacts with its national industry the CD arranged informal meetings with representatives of national and international chemical industry associations. This process reached a high point in September 1989 when the Australian Government hosted a high level Government–Industry Conference in Canberra.

In September 1989 the US Secretary of State and the USSR Foreign Minister, meeting at Jackson Hole, Wyoming, signed a Memorandum regarding bilateral verification and data exchange. In phase I there would be an exchange of general data on their respective chemical weapons capabilities and a series of visits to relevant facilities. In phase II they would exchange detailed data and permit on site inspections to verify the accuracy of the information exchanged. In June 1990 Presidents Bush and Gorbachev signed an *Agreement ... on Destruction and Non-production of Chemical weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons* under which they would cease production immediately after ratification of the agreement; reduce their CW stockpiles to 5000 agent tonnes each by the end of 2002 (with on-site inspection to confirm); further reduce their stocks to 500 agent tonnes by eight years after entry

into force of the CWC; and call for a special conference at that time to determine whether the destruction process should continue to zero over the next two years.

The 1991 Gulf War found the Coalition forces facing an Iraqi army known to have stocks of chemical weapons and a recently demonstrated willingness to use them. It also raised the threat of civilian populations in the region being exposed to danger from Scud missiles with chemical warheads. Although, in the event, chemical weapons were not used by Iraq, a further impetus was given to the work of the CD. The work was successfully completed on 3 September 1992 when a draft treaty text was transmitted to the United Nations. On 16 December 1992 the UN General Assembly adopted its Resolution 47/39, by consensus, commending the Convention and calling upon all states to become parties at the earliest possible date.

On 13 January 1993 the UN Secretary-General, the Depositary nominated in the Convention, opened the text of the Chemical Weapons Convention for signature at a three-day meeting in Paris. Plenipotentiaries of 130 states signed the Convention and adopted a Resolution establishing a Preparatory Commission to meet at The Hague, which would be the seat of the Organisation for the Prohibition of Chemical Weapons (OPCW) when the treaty entered into force. The treaty was to enter into force:

180 days after the date of deposit of the 65th instrument of ratification, but in no case earlier than two years after its opening for signature.

This two year period was to permit the Preparatory Committee to complete its task.

On 31 October 1996 Hungary became the 65th state to deposit and the CWC entered into force on 29 April 1997. 87 states had ratified the Convention by entry into force. The United States became an original state party with less than a week to spare, depositing the instrument of ratification on 25 April after a protracted battle by the Administration to win Senate approval. The Russian Federation failed to meet the deadline, ratifying in November 1997.

The Chemical Weapons Convention and its negotiation

Overview

The Biological Weapons Convention consists of a Preamble and 14 Articles, the whole requiring less than four pages of print in one of the standard works on arms control.¹⁹ By

14. Following entry into force of the CWC, the Japanese government declared the existence of the Aum Sarin production facility and OPCW inspectors confirmed its destruction.

15. Extended in 1970 to include toxin weapons.

16. The consultations actually began only in August 1976.

17. Including China for the first time and persuading France to take its previously vacant seat.

18. Initially the ‘Committee on Disarmament’ but changed to the ‘Conference on Disarmament’ in 1984 without change to the acronym.

19. Jozef Goldblat, *Arms Control*, Oslo: PRIO, 1994.

contrast, the Chemical Weapons Convention's Preamble and 24 Articles need 27 pages and the 3 Annexes a further 76 pages. In the first two years after entry into force OPCW took decisions on interpretation and implementation which require 250 pages of print in the official compilation.²⁰ The CWC is thus in its detail one of the most complex international arms control legal documents ever adopted. However its basic provisions are straightforward. States parties undertake not to develop, produce, otherwise acquire, stockpile or retain chemical weapons; not to transfer them; not to use them; and to destroy any they possess, together with facilities for their production. They are required to declare chemical weapons and related facilities. They are also required to declare production of chemicals for "non-prohibited purposes" in accordance with a list of dangerous chemicals annexed to the Convention. They are to permit entry for OPCW inspectors to verify these declarations, to witness destruction of prohibited items and, in case of a challenge by another party, to investigate possible non-compliance. The CWC requires each state party to enact legislation for the implementation of the Convention, including making it a criminal offence for persons to carry out any activity which is prohibited to the state under the Convention. The CWC provides for the establishment of a new, independent international organisation, the Organisation for the Prohibition of Chemical Weapons, to provide verification and other services to the states parties. There is also provision for assistance to states parties attacked, or threatened with chemical weapons and to protect the right of all parties to use chemicals for peaceful purposes.²¹

Scope

The full title of the CWC is the *Convention on the prohibition of the development, production, stockpiling and use of chemical weapons and on their destruction*. At the heart of the scope of the Convention is the "general purpose criterion", contained in Article II, *Definitions*.

For the purposes of this Convention:

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,²² as long as the types and quantities are consistent with such purposes;

(b) munitions and devices, specifically designed to cause death or other harm through the toxic properties of those toxic chemicals specified in sub-paragraph (a) which would be released as a result of the employment of such munitions and devices;

(c) any equipment specifically designed for use directly in connection with the employment of definitions and devices specified in sub-paragraph (b).

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.

This definition allows the Convention to capture future discoveries and inventions as well as the chemical weapons used or produced in the past. However, for practical purposes of verification it was necessary to specify particular chemicals as being of particular danger to the objectives of the Convention. This has been done by placing them in "Schedules" in an Annex to the Convention. *Schedule 1* contains toxic chemicals which have been manufactured as chemical weapons or their key precursors (chemicals which can be used as a stage in their synthesis) and for which there are no known peaceful uses, (or which are so used only in very small quantities), for example the nerve agents, the mustard gases and lewisites. The list also includes two toxins, saxitoxin and ricin. *Schedule 2* contains chemicals which can be used as precursors but which also have relatively limited use for non-prohibited purposes, for example thiodiglycol, which is a precursor for mustard gas but is also widely used as a solvent in printing inks. *Schedule 3* contains chemicals which have been used as weapons, such as phosgene and hydrogen cyanide, and precursors, which are used in large quantities for civil chemical industry purposes. The *Annex on Chemicals* is an integral part of the CWC as formally ratified but a simplified procedure has been provided for its amendment to take account of new discoveries.

Unlike the BWC, which in this regard relies upon the Geneva Protocol, the CWC contains an explicit prohibition of *use* of chemical weapons. Although this prohibition was in the rolling text without brackets from an early stage of the negotiation, there was some concern among those states which had made reservations when ratifying the Geneva Protocol that they would be giving up the right to use chemical weapons in retaliation if these weapons were used against them, particularly by states which had not joined the CWC regime. Finally, however, this prohibition was included without qualification and the Convention contains in its Article XXII the stipulation that "this Convention shall not be subject to reservations".

Another area of controversy was whether to prohibit the use in war of herbicides and riot control agents. The United States was not prepared to join a herbicide ban for two reasons: firstly that it would provide ammunition to those who argue that the massive defoliation programme in the Vietnam war had been a breach of international law; and, secondly, that herbicides continued to be necessary to provide clear areas around defensive perimeters. The most which could be agreed regarding herbicides was a mention in the Preamble:

recognising the prohibition, embodied in the pertinent agreements and relevant principles of international law, of the use of herbicides as a method of warfare.

The Convention does contain the provision that:

Each state party undertakes not to use riot control agents as a method of warfare.

The United States argued strongly that there are occasions when the use of riot control agents could be more humane than the only alternatives, which could involve lethal weapons, for example, in rescue operations for downed aircrew. The United States has since restated its policy on the

military use of riot control agents in a way which is intended to be compatible with the Convention.

Each state party undertakes to destroy all chemical weapons it owns or possesses in accordance with a fixed timetable, designed to ensure that the process is started promptly²³ and completed within 10 years.²⁴ During the negotiation it was argued by some states, France in particular, that there would be a need to retain a "security stock" at the end of the destruction period for retaliatory purposes if there were states possessing chemical weapons who had not ratified the CWC at that stage. The United States, which had been one of those supporting this position, changed its policy in May 1991, following the Gulf War, and this led to the successful conclusion of this aspect of the Convention on the basis of a requirement for total destruction.

A separate undertaking:

to destroy all chemical weapons ... abandoned on the territory of another state party

was necessary to achieve the agreement of China, which has on its territory large quantities of chemical weapons abandoned in 1945 by Japan.

Declarations

The basic foundation for creating confidence in the achievement of the objectives of the Convention is the system of declarations. Declarations are required in detail for all aspects of the production, holding and destruction of chemical weapons. Declarations are also required to give a picture of the capabilities of the chemical industry in each state party. Here the degree of detail increases with the degree of risk to the Convention. Complete detail is required for facilities producing Schedule 1 chemicals. Only a "Single small scale facility" within each state party is permitted to produce up to one tonne per year in aggregate of all chemicals on Schedule 1. One other facility is permitted to produce up to 10 kilograms per year for protective purposes. Other facilities producing Schedule 1 chemicals for research, medical or pharmaceutical purposes are also limited to less than 10 kilograms per year. Plants producing, processing or consuming Schedule 2 chemicals must declare if they produce, process or consume:

(a) 1 kilogram of a chemical designated "*" in Schedule 2, Part A [i.e. BZ];

(b) 100 kilograms of any other chemical listed in Schedule 2, Part A; or

(c) 1 tonne of a chemical listed in Schedule 2, part B.

Declaration is required of production, but not processing or consumption, of more than 30 tonnes per year of a Schedule 3 chemical. There was lengthy discussion as to whether there was a need to gather information about the chemical industry beyond the production capability for the chemicals listed in the three schedules. It was argued that many chemical plants are highly flexible and can be used for synthesis of a wide variety of chemicals. On the other hand it was important not to burden the declaration (or verification) system with large volumes of data if little real benefit would be gained. The possibility was considered of creating a fourth schedule to list other chemicals whose pro-

duction capability might pose a threat to the objectives of the Convention. Another idea included specifying particular production processes such as esterification and fluorination and declaring plant sites where such conversions were performed. In the end a more open-ended solution was adopted under which, for non-scheduled chemicals, plants must be declared if they produce by synthesis more than 200 tonnes per year of a "discrete organic chemical" (30 tonnes per year if the chemical contains phosphorus, sulphur or fluorine). Plants producing only explosives or hydrocarbons are exempt from the requirement. In order to protect commercially sensitive information, plants other than those producing Schedule 1 chemicals are required to declare the quantity produced only in terms of wide ranges.

The Convention requires the first declarations to be made within 30 days of entry into force. In the case of chemical weapons and their related facilities, which are entirely under the control of states, this proved relatively straightforward and declarations were reasonably on time. However the collection of information on the chemical industry within the major industrialised states was a large undertaking, usually involving new legislation. By no means all states parties were able to meet the deadline. Two years after entry into force there were still 30 states parties which had yet to submit their initial declarations but most of these would, in any case, be expected to provide a "nil-return". The most important laggard has been the United States, which was on time with its chemical weapon related declarations but experienced major delays in first passing and then in implementing legislation required to collect data from civil chemical industry. Two years after entry into force no declaration relating to the US civil industry had been received by OPCW²⁵ with the consequence that no industry inspection activity had taken place in that country. This had placed a strain on the willingness of industry in other states parties to accept continued operation of the verification regime.

20. *OPCW: The Legal Texts*, TMC Asser Press, 1999.

21. The Convention uses the somewhat cumbersome expression "purposes not prohibited under this Convention" in order to cover defensive activities such as testing of protective equipment.

22. These "purposes" are defined later in the same Article to mean:

"(a) Industrial, agricultural, research, medical, pharmaceutical or other peaceful purposes;

(b) Protective purposes, namely those purposes directly related to protection against toxic chemicals and to protection against chemical weapons;

(c) Military purposes not connected with the use of chemical weapons and not dependent on the use of the toxic properties of chemicals as a method of warfare;

(d) Law enforcement including domestic riot control purposes".

23. Start of destruction within 2 years; destruction of 1 per cent of the stockpile within 3 years.

24. Extension of this deadline to 15 years is possible in certain circumstances.

25. It is now anticipated that the first US industry declarations will be received by OPCW in April 2000 with the first inspection taking place in May.

Verification

The Convention provides for verification by means of on-site inspection by inspectors from a specialised international organisation, OPCW. The inspections fall into three main categories: inspection of chemical weapons and related facilities; industry inspections; and challenge inspections.

The OPCW is required to confirm promptly the declarations relating to chemical weapons. These stocks are then secured through the use of seals and regularly re-inspected until destruction is complete. Inspectors are to maintain a permanent on-site presence at the destruction facilities in order to monitor the destruction process. They are also to seal and then to confirm the destruction²⁶ of chemical weapons production facilities. Although the fine detail required long and difficult negotiation, continuing through the Preparatory Commission phase into the early days of operation of OPCW itself, the principle of on-site inspection for these purposes was easily accepted²⁷ as only possessor states would be affected; there was useful precedent in the on-site inspection provisions of US-USSR(Russia) bilateral arms control agreements; and the inspectors could be confined to areas which were government controlled and usually devoted entirely to chemical weapons related activities.

For declarations related to production of chemicals for purposes not prohibited by the Convention there is a hierarchy of provisions for on-site inspection varying from:

systematic verification through on-site inspection and monitoring with on-site instruments,

for the single small scale facility permitted to produce Schedule 1 chemicals, to inspection of randomly selected plant sites for production of Schedule 3 chemicals or discrete organic chemicals²⁸ subject to the provisos:

No plant site shall receive more than two inspections per year.

The combined number of inspections shall not exceed three plus 5 per cent of the total number of plant sites declared by a State Party ... or 20 inspections whichever of these two figures is lower.

The concept of industry inspection was more difficult, potentially raising constitutional problems in some states as the chemical industry ranges from giant multi-nationals with large installations to very small operations with modest (but sometimes very sophisticated) output and a handful of employees; is spread widely through the industrialised and industrializing world; and operates very largely in the private sector. Legislation would be necessary in most states to require access for inspectors and the acquiescence of the industry would be crucial. With regard to the latter point, the leaders of the industry had taken the view from an early stage that for public relations reasons they needed to be seen as supportive of the Convention and not involved in producing chemical weapons. The experience and the precedent of the IAEA²⁹ and its "safeguards" programme, involving visits by international inspectors to plants in the nuclear industry also proved helpful. From this came the concept of Facility Agreements under which a legally binding document is drawn up between OPCW and the state party for each plant site to be inspected, setting out how the

inspection is to be conducted and providing the appropriate degree of access. The confidentiality provisions of the Convention (see below) were also vital in this area.

The third type of inspection is "challenge":

Each State Party has the right to request an on-site challenge inspection of any facility or location in the territory or in any other place under the jurisdiction or control of any other State Party for the sole purpose of clarifying and resolving any questions concerning possible non-compliance with the provisions of this Convention and to have this inspection conducted anywhere without delay by an inspection team designated by the Director-General ...

... the inspected State Party shall have:

(a) the right and the obligation to make every reasonable effort to demonstrate its compliance with this Convention and, to this end, to enable the inspection team to fulfil its mandate;

(b) the obligation to provide access within the requested site for the sole purpose of establishing factors relevant to the concern regarding possible non-compliance; and

(c) the right to take measures to protect sensitive installations, and to prevent disclosure of confidential information and data, not related to this Convention.

A form of challenge inspection is included in the 1990 CFE Treaty³⁰ and inspection of "suspect" sites is included in START 1 (1991),³¹ so its inclusion in the CWC in 1992 was not entirely a first but its scope and importance within the Convention certainly set new norms for arms control agreements. (A fact not lost on the IAEA, which was swift to propose to its member states an upgrade to the safeguards system drawing on this precedent.)

The states of the West had long demanded intrusive verification systems as part of any disarmament agreement, claiming that this caused no problems for "open" democratic societies and challenging the "closed" societies of the socialist system to open themselves. The states of the East took the line that the Western proposals were simply a mechanism for spying. By the time the CD Ad Hoc Committee had been established the USSR had come around to the concept of "voluntary" acceptance of some form of challenge. The US in its 1984 draft (CD/500) included a provision for "special on-site inspections", "at any time" at "any location or facility subject to systematic international on-site inspection..." or "any military location or facility, or other location or facility owned ... or ... controlled by the Government of a Party." The UK in 1986 proposed (CD/715) that challenge inspection could be refused but only in exceptional circumstances and provided that the challenged state offered alternative arrangements to demonstrate compliance. In 1987 USSR Foreign Minister Sheverdnadze announced to the CD that his country was ready to accept mandatory challenge inspections. It was now becoming evident to the negotiators that, due to the nature of chemical weapons and the potential significance of non-government owned chemical facilities in their manufacture, a challenge scheme limited to government owned or controlled facilities was not going to be sufficient to provide confidence in compliance. A true "anytime, anywhere" challenge scheme was going to be required. A review of the situation within the United States raised

concerns that the CWC inspection regime could put at risk military secrets in unrelated areas. (The “stealth” aircraft had just appeared after years of development as a “black program”). The UK had submitted a paper in 1990 setting out “managed access” proposals based on six practice challenge inspections in locations of great security sensitivity. However these techniques alone were not enough to satisfy the critics and in 1991 the US and UK, together with Australia and Japan, put forward a proposal which, while retaining the concept of challenge inspection, built in some additional safeguards for the inspected facility which were seen by some at the time as a retreat from the pure “any-time, anywhere” ideal. This proposal formed the basis for the final version included in the Convention.

The requesting state party is required to specify the perimeter of the site to be inspected. This perimeter must not bisect any building or area delineated by a security fence. At the point of entry to the inspected state,³² the inspected state may propose an alternative perimeter to the inspection team. 24 hours are allowed for negotiation of the perimeter (with the inspected state having the final say) after which the inspection team must be taken to the perimeter. They should arrive at the perimeter not later than 36 hours after their initial arrival at the point of entry. At this time they have the right to begin monitoring exits from the site. (The inspected state is required to provide factual information regarding all vehicular exit activity for all land, air and water vehicles, beginning not later than 12 hours from the team’s arrival at the point of entry.) The inspection team then negotiate access within the perimeter on the basis of ‘managed access’. Under this procedure:

The inspection team and the inspected State Party shall negotiate: the extent of access to any particular place or places within the final and requested perimeters; the particular inspection activities, including sampling, to be conducted by the inspected State Party; and the provision of particular information by the inspected State Party.

... the inspected State Party shall have the right to take measures to protect sensitive installations and prevent disclosure of confidential information and data not related to chemical weapons. Such measures may include, *inter alia*:

- (a) removal of sensitive papers from office spaces;
- (b) shrouding of sensitive displays, stores, and equipment;
- (c) shrouding of sensitive pieces of equipment, such as computer or electronic systems;
- (d) logging off of computer systems and turning off of data indicating devices;
- (e) restriction of sample analysis to presence or absence of chemicals listed in schedules 1, 2 and 3 or appropriate degradation products;
- (f) using random selective access techniques whereby the inspectors are requested to select a given percentage or number of buildings of their choice to inspect; the same principle can apply to the interior and content of sensitive buildings;
- (g) in exceptional cases, giving only individual inspectors access to certain parts of the inspection site.

Although these provisions can give the impression that an inspected state can heavily restrict the activities of inspectors, in practice the political pressure to provide a convincing demonstration of compliance should ensure that this is not so. Indeed the Convention specifically states that managed access may not be invoked by an inspected state party to conceal evasion of its obligations not to engage in activities prohibited under the Convention.

The negotiators also discussed at length the political control of the challenge inspection process. Should the Executive Council approve the inspection in advance? How to prevent abuse of the right to challenge? The system adopted gives the Executive Council the right to stop an inspection if three-quarters of the members so decide, within 12 hours of the receipt of the request for a challenge inspection. This will be a very high threshold to reach, particularly as an abstention in the vote has the same effect as a vote to proceed with the inspection. The Executive Council is required:

to review the final report of the inspection team as soon as it is presented, and to address any concerns as to:

- (a) Whether any non-compliance has occurred;
- (b) Whether the request had been within the scope of [the] Convention; and
- (c) Whether the right to request a challenge inspection had been abused.

... In the case of abuse, the Executive Council shall examine whether the requesting state party should bear any of the financial implications of the challenge inspection.

Other Key Provisions

Assistance For many states, particularly the developing countries, chemical weapons could pose a very real threat in that their potential adversaries could acquire them much more easily than nuclear weapons and their effect would be severe in the absence of adequate protective systems. Iran, which had suffered in this way in its war with Iraq was among the leaders of those pressing for a strong provision in the Convention. There was considerable sympathy

- 26. Or, in certain cases, conversion for permitted uses.
- 27. The USSR agreed to accept on-site inspection for verification of destruction of stocks in February 1984.
- 28. For DOC plants inspections only start in the fourth year after entry into force and then only if the Conference of the States Parties does not decide otherwise. (The Conference of the States Parties took the decision to proceed with DOC inspections at its 1999 Meeting.)
- 29. International Atomic Energy Agency, based in Vienna, Austria.
- 30. Treaty on Conventional Armed Forces in Europe. (The first arms control agreement to have a challenge inspection provision was the Stockholm Document in 1986. This provided for challenge, limited by quota, for land forces training exercises thought to exceed the notification threshold.)
- 31. Treaty between the USA and the USSR on the Reduction and Limitation of Strategic Offensive Arms.
- 32. Usually an international airport.

among the industrialised countries, who would have to provide the bulk of the assistance, but a reluctance to be legally bound to any particular response to a future event whose political parameters could not necessarily be foreseen. The final text gets round this problem by providing a series of options.

The Convention defines “Assistance” as:

The co-ordination and delivery to States Parties of protection against chemical weapons, including, *inter alia*, the following: detection equipment and alarm systems; protective equipment; decontamination equipment and decontaminants; medical antidotes and treatments; and advice on any of these protective measures.

The Convention affirms the right of all parties to conduct research into protection (and requires an annual report of such programmes) and to engage in transfers of protective equipment and expertise. The Technical Secretariat is required to establish a data bank and to provide expert advice on protection to member states. States parties undertake to provide assistance through OPCW and to this end have the option: to contribute to a voluntary fund for assistance; to enter into an agreement with OPCW “concerning the procurement, upon demand, of assistance”; and/or to declare the kind of assistance they might provide in response to an appeal by OPCW. Each state party which considers that:

- (a) Chemical weapons have been used against it;
- (b) Riot control agents have been used against it as a method of warfare; or
- (c) It is threatened by actions or activities of any state that are prohibited for States Parties by Article I

has the right to request and [subject to a procedure involving investigation by the Director-General and decision by the Executive Council] to receive assistance.

Peaceful use/Export control The NPT³³ and the BWC, which are both designed to control weapons based on technologies which have important peaceful uses, both contain Articles with broadly similar text, designed to ensure that access to the benefits for legitimate purposes would be available to all Treaty parties. In the NPT Article IV this is expressed as follows:

Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination...

All Parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy.

The BWC in its Article X picks up the second of these paragraphs almost verbatim with only the substitution of “bacteriological (biological) agents and toxins for peaceful purposes” at the end of the sentence. It then goes on to require that:

This Convention shall be implemented in a manner designed to avoid hampering the economic or technological development of States Parties to the Convention or international cooperation in the field of peaceful bacteriological (biological) activities, including the

international exchange of bacteriological (biological) agents and toxins and equipment for the processing, use or production of bacteriological (biological) agents and toxins for peaceful purposes in accordance with the provisions of the Convention.

By the time the CWC reached the last stages of negotiation the Nuclear Suppliers Group, set up to monitor trade in dual-use nuclear materials and equipment, and the Australia Group, performing a similar role in the chemical and biological fields, were regarded with deep suspicion by many developing countries who believed that their declared aim of limiting proliferation of weapons of mass destruction was a cover for an attempt to maintain a monopoly for a few developed countries in the economic benefits of the related technologies. In consequence, the CWC text was further strengthened. Article XI starts with a paragraph essentially identical to that quoted above from the BWC but then continues:

Subject to the provisions of this Convention and without prejudice to the principles and applicable rules of international law, the States Parties shall:

Have the right, individually or collectively, to conduct research with, to develop, produce, acquire, retain, transfer, and use chemicals;

Undertake to facilitate, and have the right to participate in, the fullest possible exchange of chemicals, equipment and scientific and technical information relating to the development and application of chemistry for purposes not prohibited under this Convention;

Not maintain among themselves any restrictions, excluding those in any international agreements, incompatible with the obligations undertaken under this Convention, which would restrict or impede trade and the development and promotion of scientific and technological knowledge in the field of chemistry for industrial, agricultural, research, medical, pharmaceutical or other peaceful purposes;

Not use this Convention as grounds for applying any measures other than those provided for, or permitted, under this Convention nor use any other international agreement for pursuing an objective inconsistent with this Convention;

Undertake to review their existing national regulations in the field of trade in chemicals in order to render them consistent with the object and purpose of this Convention.

Even this much tougher language did not satisfy the hard-liners and, as part of the deal under which the CWC draft was finally adopted by the CD for transmission to the United Nations General Assembly, the delegate of Australia made a statement on behalf of the countries members of the Australia Group which included the undertaking:

to review, in the light of the implementation of the Convention, the measures that they take to prevent the spread of chemical substances and equipment for purposes contrary to the objectives of the Convention, with the aim of removing such measures for the benefit of states parties to the Convention acting in full compliance with their obligations under the Convention.

Sanctions There was a wish on the part of some participants in the negotiations to include a mechanism to ensure compliance with the Convention through the automatic

application of sanctions for any breach. However, when proposals were discussed many representatives were unable to commit their governments in advance to take specific action in situations whose full circumstances could not be known before the event. The Permanent Members of the Security Council in particular were unwilling to have any provision which might seem to usurp the rights and obligations of that body. The final text provides for the possibility in cases of non-compliance to:

restrict or suspend the State Party's rights and privileges under this Convention until it takes the necessary action to conform with its obligations under this Convention.

The most important "rights" which might be suspended are presumably those related to trade in scheduled chemicals. The CWC also allows:

In cases where serious damage to the object and purpose of this Convention may result from activities prohibited under this Convention, in particular by Article I, the Conference may recommend collective measures to state parties in conformity with international law.

The most likely outcome, however, is covered in the next paragraph by the requirement that:

The Conference shall, in cases of particular gravity, bring the issue, including relevant information and conclusions, to the attention of the United Nations General Assembly and the United Nations Security Council.

Confidentiality One of the most important issues to be resolved in the drafting of a Convention which relies for its effective operation on an elaborate system of declarations and intrusive on-site inspections affecting both military installations and the civil chemical industry was that of the protection of confidential information. The basic requirements are set out in Article VIII paragraph 5:

The Organization shall conduct its verification activities provided for under this Convention in the least intrusive manner possible consistent with the timely and efficient accomplishment of their objectives. It shall request only the information and data necessary to fulfil its responsibilities under this Convention. It shall take every precaution to protect the confidentiality of information on civil and military activities and facilities coming to its knowledge in the implementation of this Convention and, in particular, shall abide by the provisions set forth in the Confidentiality Annex.

The Confidentiality Annex provides an outline of a strict confidentiality regime which OPCW is required to convert into a detailed set of regulations covering its own conduct and to include in agreements with states parties governing inspection activities on their territory. The Organisation assigns levels of confidentiality, in accordance with a classification system, to items of information received from member states, either directly or as the result of inspection activity in that state, as requested by the state. These levels then influence who within the Organisation may have access and the degree of protection to be afforded both within the Organisation and by other member states which receive the information. Member states are notified in advance which members of the Technical Secretariat are to receive clearance to handle their classified data. A Commission is

to be established to consider disputes related to confidentiality.

The Regime

The regime established by the Convention has two basic components: one within the individual states parties, regulated by Article VII; and the other comprising the new international organisation, OPCW, established under Article VIII. Of the two, the first is arguably more fundamental although both are of course necessary to its successful operation.

National preparations Each state party is required to enact penal legislation covering any activity by natural and legal persons on its territory, or by natural persons possessing its nationality anywhere, which the Convention prohibits to the state. It is also required:

to adopt the necessary measures to implement its obligations under the Convention

which in most states also requires legislation relating, for example, to the collection of data from private companies and providing access for inspectors. Some states have found it useful to introduce a licensing system for the production and transfer of scheduled chemicals. A further important stipulation is the designation or establishment of

a National Authority to serve as the national focal point for effective liaison with the Organization and other States Parties.

This is necessary given the short time-lines for setting up inspections, the complexity of declaration requirements, and the number of government departments likely to share responsibilities relevant to the Convention (in most states at least the ministries of foreign affairs, defence, industry and trade).

The Organisation The states parties to the CWC:

establish the Organization for the Prohibition of Chemical Weapons to achieve the object and purpose of this Convention, to ensure the implementation of its provisions, including those for international verification of compliance with it, and to provide a forum for consultation and co-operation among States Parties.

Three organs of the Organisation are provided for: the Conference of the States Parties; the Executive Council; and the Technical Secretariat.

Conference of the States Parties All states parties to the Convention are members of the Organisation³⁴ and are

33. Treaty on the Non-Proliferation of Nuclear Weapons (1968).

34. Interestingly, the Convention stipulates that: "a State Party shall not be deprived of its membership in the Organization". Expulsion is thus not a sanction which can be applied for non-compliance. Nor can states be pushed out for external political reasons as has happened, for example to Israel and to South Africa in other organizations in previous decades.

entitled to send a representative to the Conference of the States Parties. This is the principal decision taking organ and has three different modes of meeting. It meets in annual session, unless it decides otherwise; it can meet in Special Session if circumstances demand, including, at five year intervals, to undertake reviews of the operation of the Convention; and it can be convened in the form of an Amendment Conference if amendments to the Convention are proposed.

Executive Council It was recognised that, as in many international organisations, there would also be a need for a body of limited membership, meeting at more frequent intervals to manage the day-to-day business of the Organisation. However, it proved very difficult to agree a size and composition for the Executive Council, as it was to be called. Everyone was agreed that a small Council was likely to be more efficient and to be able to reach decisions more easily but all were equally determined to make sure of their own participation, including, for the most powerful, permanent membership. The final formula requires each of five geographical regions³⁵ to designate a number of members, a certain proportion of which

shall, as a rule be the States Parties with the most significant national chemical industry in the region as determined by internationally reported and published data; in addition, the regional group shall agree also to take into account other regional factors in designating these ... members.

The final composition agreed was a total Council membership of 41: Africa 9 (3 “with the most significant chemical industry”); Asia 9 (4); Eastern Europe 5 (1); Latin America and the Caribbean 7 (3); and Western European and others³⁶ 10 (5), with a further member to be designated alternately by the Asian and the Latin American states, each member holding office for two years (but with redesignation permitted). This issue proved one of the most difficult of the whole CWC negotiation. The Western European and Others Group only joined consensus after a formula had been worked out stipulating which states would hold which seat during which years of the first 16 years of existence of the Organisation. The final day of the CD Session of 1992, when the text was sent forward to the, UN had to be interrupted for a final, unsuccessful effort to strike a deal within the Asian Group.³⁷

Technical Secretariat Whilst it was recognised that implementation of the Convention would require a properly qualified and trained Inspectorate, supported by scientific, administrative and other staff, there was concern not to create an oversized and inefficient bureaucracy along the lines of certain other International Organisations which were under criticism at the time. However, the CWC text on the Technical Secretariat is comprised largely of a summary of its responsibilities arising from other parts of the document. It gives as guidance for its size and shape only:

The technical secretariat shall comprise a Director-General, who shall be its head and chief administrative officer, inspectors and such scientific, technical and other personnel as may be required.

The Director-General shall be responsible to the Conference and the Executive Council for the appointment of the staff and the organisation and functioning of the Technical Secretariat. The paramount consideration in the employment of the staff and in the determination of the conditions of service shall be the necessity of securing the highest standards of efficiency, competence and integrity. Only citizens of state parties shall serve as the Director-General, as inspectors or as other members of the professional and clerical staff. Due regard shall be paid to the importance of recruiting the staff on as wide a geographical basis as possible. Recruitment shall be guided by the principle that the staff shall be kept to a minimum necessary for the proper discharge of the responsibilities of the Technical Secretariat.

Other bodies The Convention also provides for the creation of a Scientific Advisory Board and, as mentioned above, a Confidentiality Commission. Both of these are composed of a limited number of independent experts, nominated by states but selected and appointed in accordance with rules to be established by the Conference.

Preparatory Commission

The document forwarded to the UN by the CD in September 1992 included, in addition to the draft of the Convention, a “Text on the establishment of a preparatory commission”. The meeting in Paris during 13–15 January 1993, at which 130 states signed the Convention, passed a Resolution, establishing a Preparatory Commission and incorporating this text, which contained a detailed list of the tasks to be performed by the Commission. In addition to designing the new Organisation — setting up staffing structures, writing job descriptions, recruiting and training staff; preparing and equipping office accommodation, a laboratory and equipment store; preparing draft budgets and staff and financial regulations for adoption by the first Conference of the States Parties; preparing procedures for handling the required declarations from states in a secure manner, including the acquisition of suitable computer systems — the Commission was asked to tackle a list of 23 distinct “draft agreements, provisions and guidelines” ranging from guidelines on detailed procedures for verification and for the conduct of inspections to recommendations for procedures to be followed in cases of breaches of confidentiality.

The Commission held its first meeting in the Hague, Netherlands during 8–12 February 1993. It appointed an Executive Secretary to set up and run its own secretariat, known as the Provisional Technical Secretariat, to be the basis of the Technical Secretariat at entry into force of the Convention. The Commission, consisting of representatives of all signatory states met in plenary session for periods of one week at roughly three month intervals. In the intervening period meetings of government experts, each of a few days duration, prepared reports on the various issues, for example one week might see a meeting of experts discussing the Staff Regulations for the Technical Secretariat of the new Organisation and the next week a different group would discuss procedures for handling and analysing samples taken during inspections. In all the Commission was in

existence for four and a half years, holding its sixteenth and final session from 9 to 15 April 1997.

The Commission was reasonably successful in its work of creating a basic infrastructure for OPCW. At the time of entry into force the Provisional Technical Secretariat had an authorised establishment of 229 posts, of which 175 had been filled with staff drawn from 50 different countries. In addition, 148 inspector trainees were in the final stages of their six month training course. Most of these, both staff and inspectors were available for immediate appointment to the OPCW Technical Secretariat. The principal difficulty was that of nationality. Staff of the Commission could be appointed from any *signatory* state whereas staff for OPCW had to be nationals of a state which had *ratified* the Convention. Thus nationals of states which missed the deadline of ratification by entry into force (29 April 1997), such as Russia, Iran and Pakistan, who between them had contributed six senior members of staff including a division director, were obliged to stand down.³⁸

The Commission spent three years negotiating with the authorities of the Host Country, the Netherlands, about the detailed terms for the provision of accommodation for OPCW. As a result the agreement for the purpose-built office building was only signed in March 1996 and completion was due in January 1998. The OPCW was therefore obliged to start operation in temporary accommodation on two sites a kilometre apart and to plan a major move only months after coming into being. The Commission was more successful with the Laboratory and Equipment Store which was leased, converted and equipped in time to be fully operational at entry into force of the Convention.

The Commission was less successful with the substantive operational matters which it was mandated to resolve under the Paris Resolution. Whilst a great deal of work was done in more than four years of discussion in expert groups in clarifying the issues, in very many cases consensus could not be achieved on key questions. The Final Report of the Commission contained 63 paragraphs of “unresolved issues” ranging from the draft Staff Regulations to the definition of “low concentration” of chemicals (below which they would not need to be declared). Nonetheless the Technical Secretariat was able to start carrying out its key functions of receipt of declarations and initial inspections without waiting for all the answers.

A factor which caused its own problems was the bilateral relationship between the United States and Russia. As described above, in 1990 the US and USSR signed an agreement under which they would destroy their chemical weapons and inspect each other in so doing. The CWC was adjusted to take account of this arrangement and allows for OPCW to audit the bilateral inspections, using smaller teams than would be required for full inspection. The CWC requires inspected states parties to reimburse the OPCW for the cost of inspections of chemical weapons and related facilities (the “possessor pays” principle) but does not require this for the audit of the bilateral arrangements. The Commission decided to plan on the assumption that both states would ratify by entry into force and that the bilateral arrangements would be in force. In fact the bilateral agreement was not ratified (and Russia missed the deadline). The result of this was that inspector numbers were lower

than needed and the detail of how to calculate the costs to be refunded had not been agreed.

OPCW since entry into force

The first session of the Conference of the States Parties was convened in The Hague on 6 May 1997 by the UN Secretary-General, Kofi Annan, Depositary of the Convention. Representatives attended from 117 states of which 80 were parties and the remainder mostly signatories still to ratify.³⁹ Four of the five Permanent Members of the Security Council and all 15 members of the European Union were among the Original Parties. (Of the significant absentees, Russia, Iran and Pakistan all had become parties before the end of the second session of the CoSP in November 1997).

The Conference duly established the Executive Council on the basis of regional designations, appointed Ambassador José Bustani of Brazil as Director General of the Technical Secretariat, agreed the DG’s proposals for senior management appointments, adopted a budget for 1997 and took a range of operational and administrative decisions on the basis of recommendations from the Preparatory Commission. The Conference also adopted a procedure for addressing unresolved issues. The intention was to have all these issues settled in time for decisions by the second session. Alas this proved too ambitious and, although many important questions have been resolved in the Organisation’s first two and a half years, at the turn of the century OPCW is still plagued with unresolved issues.

There had been concern that the requirements of the CWC for initial inspections of all declared chemical weapon stocks; CW-related facilities; and plants producing Schedule 1 and 2 chemicals within relatively short time periods (mostly 90 or 180 days) would place an impossible burden on the newly created Inspectorate. The proposed establishment for the Inspectorate was 211 Inspectors and Assistants two thirds of whom were to come from the first training course, which started in January 1997 with a planned duration of six months, and the balance to come from a second course to be run once OPCW was operational. 150 trainees joined the first course of whom only 115 could be recruited initially, most of the balance coming from states which had not ratified by entry into force. By the end of 1997 the number of Inspectors had risen to 126.

35. The CWC uses the same regional definitions for electoral purposes as the United Nations.

36. The “other States” being Australia, Canada, New Zealand and the United States.

37. In the end the Asian Group were only able to agree an initial slate in the course of the First Session of the Conference of the States Parties after the CWC had entered into force.

38. In fact, a number of posts were left open and when these three countries ratified (all within six months) some of their nationals were appointed to OPCW, although not usually to the posts they had held previously.

39. Cuba, which had deposited its ratification on the day on which the CWC entered into force, was obliged to wait 30 days for the Convention to enter into force for it in accordance with Article XXI (2).

The second course was run in 1998 and by the end of that year the Inspectorate was up to full strength.

Some of the operational problems were offset by the fact that initial inspections of United States chemical weapons facilities could be done before Russia ratified and by the failure of the US to declare its chemical industry as required under Article VI. The relatively short lapse of time before Russia ratified meant that there were no prolonged political problems over implementation of Articles IV and V relating to chemical weapons. However, the long delay in first passing through Congress and then implementing the US legislation regarding chemical industry declarations and inspections (it is likely to be three years after entry into force before this is complete) caused very serious problems with those countries which had promptly declared Schedule 2 production and whose plants were receiving not only initial but also follow-up inspections before any of their US competitors had seen an Inspector. The funds in the 1999 budget for Schedule 2 inspections were divided into two unequal portions, the larger being reserved for inspections in states which had not declared such sites as of 20 November 1998.

Another area of problem related to the handling of the declarations themselves. It had always been recognised that there would be a large amount of data to be handled and, even without the data on the US civil industry, the Technical Secretariat had received by July 1998, 15 months after entry into force, 23,600 pages of declarations of which 82 per cent had been classified by the sending government and therefore required handling under the complex rules of the Confidentiality Policy. An electronic data management system had been intended to assist in the task of storing, retrieving and distributing this material but successive audits of the system by experts from member states declared it not sufficiently secure and at the end of 1999 operations were still reliant on a manual system of declaration handling.

Despite these problems the initial achievements are impressive. As of 29 April 1999, 8.4 million chemical munitions and bulk containers and 70,000 tonnes of chemical agent had been declared to, and verified by, the OPCW. By that date OPCW inspectors had witnessed the destruction of 577,000 items and 2,371 tonnes of agent.⁴⁰ Four states parties — India, the Russian Federation, the United States of America and one other⁴¹ — had declared current holdings of chemical weapons at 33 storage sites. Nine states parties — China, France, India, Iran, Japan, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland, the United States of America and one other — had declared either present or past capabilities to produce chemical weapons. All 59 facilities in these declarations were confirmed by the OPCW Inspectorate to be inactivated with 11 of these certified as completely destroyed. Six states parties — Belgium, France, Germany, Italy, Japan and the United Kingdom — declared old⁴² chemical weapons on their territory and three states parties — China, Italy and Panama — declared abandoned⁴³ chemical weapons on their territory. Japan declared that it had abandoned chemical weapons on the territory of another state party.

The OPCW Annual Report for 1998 gives a detailed account of the activities of the Organisation, particularly regarding verification, in its first full calendar year of

operation. By the end of that year 86 out of 121 states parties (71 per cent) had provided the initial declarations required under the Convention. 24 Schedule 1 plant sites were declared in 19 states of which 8 were “single small scale facilities” (permitted under the CWC to produce up to one tonne per year in total of Schedule 1 chemicals), the remainder were facilities for protective purposes (permitted to produce 10kg) and in one case a facility for medical, research and pharmaceutical purposes (permitted to produce 100g). 297 sites in 24 states were declared to be involved in production, processing or consumption of Schedule 2 chemicals. Of these 119 were determined to be inspectable, of which more than 70 per cent were in only five states — China, France, Germany, Italy and Japan. 395 Schedule 3 plant sites were declared, 329 inspectable in 27 states of which more than 75 per cent were in five states — China, France, Germany, India and Japan. (These figures are lower than the planning estimates prepared by the Preparatory Commission, largely because of the absence of the US declaration for Schedules 2 and 3.)

The OPCW carried out 261 inspections in 1998 at 198 sites involving 16,927 inspector days. 84 per cent of the inspector days were devoted to chemical weapons related inspections; 71 per cent of the total were spent in the United States, 66 per cent of the total for monitoring of destruction activities. The 16 per cent of total inspector days which were devoted to inspection of industry were divided between inspections of 13 Schedule 1 facilities, 68 Schedule 2 and 13 Schedule 3.

OPCW has not been totally preoccupied with verification activities. The International Cooperation and Assistance Division, with help as appropriate from the rest of the Technical Secretariat has been bringing Articles X and XI of the Convention into operation. This has involved receiving from member states offers of assistance for states parties in case of use or threat of use of chemical weapons together with contributions to the Voluntary Fund for this purpose. A data bank on protection against chemical weapons has been established and is being continually expanded and updated. A programme has been established to assist member states in preparing their declarations, both through workshops in The Hague and through the dispatch of experts to capitals. Another programme is designed to strengthen the analytical capabilities of national laboratories. The Preparatory Commission established a series of courses for National Authority personnel and this programme has been continued and expanded by OPCW. The External Relations Division also contributes to these efforts by organising seminars in different regions of the world where member states officials and Technical Secretariat personnel can exchange views and experience on aspects of the operation of the Convention.

Conclusions

By any measure the first two and a half years of operation of the Chemical Weapons Convention must be considered a success. The OPCW, and particularly its Technical Secretariat, has met effectively the challenges of bringing a highly complex regime into effective operation.

However, it is not possible yet to relax the efforts to achieve a fully effective regime. It is essential that the United States declaration under Article VI of its civil chemical industry is passed to OPCW without further delay and inspections started so that the feeling of imbalance in acceptance of the burdens on civil industry among those states which have been accepting such inspections over the first two years of operation of the CWC can be dissipated. The OPCW needs to find solutions to those unresolved issues which have operational consequences so that member states can start to experience a "level playing field" in the operation of the Convention. A solution will also need to be found to the high cost in Inspectorate resources in the continuous on-site presence required at destruction plants. As more of these facilities become operational (at least a dozen more are due to start operation in the years up to 2003) the burden on the budget of the Organisation could become disproportionate to the value to the regime of this element within the totality of the verification design.

The CWC calls for all declared chemical weapons and related facilities to be destroyed by the end of April 2007. In practice this target is likely to prove too ambitious. Even in the United States, where the programme is currently expected to cost \$15 billion, doubts are being expressed about the ability to meet the deadline. In the Russian Federation, which has declared a stockpile 30 per cent larger than that in the US, expenditure on anything approaching this scale is not feasible in that country's current economic situation. The Russian Federation has in fact informed the Executive Council that it will be unable to meet the Convention's first CW destruction deadline to destroy 1 per cent of its Category 1 chemical weapons by 27 April 2000. It will be important on the one hand to maintain political commitment; to keep the pace of destruction at the maximum achievable, with an effective system of sealing and inspecting stockpiles; but, on the other hand, not to allow the CWC regime to be damaged by excessive recrimination if deadlines have to be extended or interim targets are not met.

The other key to a fully effective chemical weapons ban is the achievement of universal membership of the CWC. By the end of 1999, two and a half years after entry into force, the Convention had 128 parties which had ratified or acceded and 42 signatories. Signatories still to ratify included Israel. Non-signatories included North Korea, Egypt, Iraq, Libya and Syria (all of whom are, however, parties to the 1925 Geneva Protocol). Successful inclusion of all of these states in the coverage of the Convention will probably need to be preceded by solution of wider political problems but in the meantime it is essential to complete the ratification and accession process among the other states which have not done so.

We have yet to reach the point where the armed forces of states can give up their protective suits, gas masks and auto-injectors. The continuance of the terrorist threat may, in any case, make this impossible. But there is no doubt that the efforts of those who have worked over the last quarter of the Twentieth Century to bring the CWC and OPCW into being have made the world a safer place with regard to at least this particularly unpleasant weapon.

40. Two thirds of all inspection manpower, more than 1,000 man-days per month, is taken up in inspecting chemical weapon destruction facilities in the United States. The CWC requires continuous presence of inspectors when chemical weapons are being destroyed. The major destruction plants at Tooele, Utah and Johnston Atoll operate on a 24-hour basis.
41. This state exercised its right under the confidentiality rules to have its identity withheld in public statements by the OPCW.
42. Produced before 1925 or produced between 1925 and 1946 but no longer useable.
43. Chemical weapons, including old chemical weapons, abandoned by a state after 1 January on the territory of another state without the consent of the latter.

Additional Sources

The *Verbatim Records* of the Conference on Disarmament and its predecessors, together with texts of *Working Papers*, are maintained in the libraries of the United Nations. For the chemical weapons negotiations the Department of External Affairs and International Trade of the Government of Canada has published a comprehensive set of extracts from the UN originals with an index. (Even the extracts are voluminous and not particularly user-friendly.)

OPCW official documents, and a variety of background information, can be accessed through the website www.opcw.org which also carries copies of the Organization's newsletter entitled *OPCW Synthesis*.

The CBW Conventions Bulletin (formerly the *Chemical Weapons Convention Bulletin*) — published quarterly since 1988 by the Harvard Sussex Program on CBW Armament and Arms Limitation (website: www.fas.harvard.edu/~hsp/).

Health Aspects of Chemical and Biological Weapons, a 1970 report by the World Health Organization, covers the nature of chemical warfare agents and their medical aspects. This report is currently in the process of being updated.

The Stockholm International Peace Research Institute (website: www.sipri.se) includes coverage of chemical weapons in its annual *SIPRI Yearbooks*. Between 1971 and 1975 it published in six volumes — *The Problem of Chemical and Biological Warfare* — which have been recently been republished in CD-ROM form. More recently individual topics have been covered in *Chemical & Biological Warfare Studies* (popularly known as "scorpions" from the image on the cover), a series which to date includes 18 titles divided between chemical and biological warfare issues.

Readers interested in the historical perspective on chemical weapons use are referred to: L F Haber, *The Poisonous Cloud: Chemical Warfare in the First World War*, (Oxford: Clarendon Press, 1986) covers the activities of all the combatants. A first hand but purely British view is given in *Gas!: The Story of the Special Brigade*, by Maj-Gen C H Foulkes, (Edinburgh & London: Blackwood, 1936).

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AVERTING THE HOSTILE EXPLOITATION OF BIOTECHNOLOGY

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Every major technology — metallurgy, explosives, internal combustion, aviation, electronics, nuclear energy — has been intensively exploited, not only for peaceful purposes but also for hostile ones. Must this also happen with biotechnology, certain to be a dominant technology of the twenty-first century?

Such inevitability is assumed in “The Coming Explosion of Silent Weapons” by Commander Steven Rose (*Naval War College Review*, Summer 1989), an arresting article that won awards from the US Joint Chiefs of Staff and the Naval War College:

The outlook for biological weapons is grimly interesting. Weaponers have only just begun to explore the potential of the biotechnological revolution. It is sobering to realize that far more development lies ahead than behind.

If this prediction is correct, biotechnology will profoundly alter the nature of weaponry and the context within which it is employed. During World War II and the Cold War, the United States, the United Kingdom, and the Soviet Union developed and field-tested biological weapons designed to attack people and food crops over vast areas. During the century ahead, as our ability to modify fundamental life processes continues its rapid advance, we will be able not only to devise additional ways to destroy life but will also become able to manipulate it — including the processes of cognition, development, reproduction, and inheritance. A world in which these capabilities are widely employed for hostile purposes would be a world in which the very nature of conflict had radically changed. Therein could lie unprecedented opportunities for violence, coercion, repression, or subjugation. Movement towards such a world would distort the accelerating revolution in biotechnology in ways that would vitiate its vast potential for beneficial application and could have inimical consequences for the course of civilization.

Is this what we are in for? Is Commander Rose right? Or will the factors that thus far have prevented the use of biological weapons survive and even be augmented in the coming age of biotechnology? After all, despite the fact that the technology of potentially devastating biological weapons has existed for decades and although stocks of such weapons were produced during the Cold War, their only use appears to have been that by the Imperial Japanese Army in Manchuria more than half a century ago.

A similar history of restraint can be traced for chemical weapons. Although massively used in World War I and stockpiled in great quantity during World War II and the Cold War, chemical weapons — despite the hundreds of wars, insurgencies, and terrorist confrontations since their last large-scale employment more than 80 years ago — have seldom been used since. Their use in Ethiopia, China, Yemen, and Vietnam, and against Iranian soldiers and Kurdish towns are among the few exceptions. Indications

that trichothecene mycotoxins had been used in Laos and Cambodia in the 1970s and 1980s proved to be illusory.

Instead of the wave of chemical and biological terrorism some feared would follow the sarin gas attacks perpetrated by the Aum Shinrikyo cult in Japan in 1994 and 1995 or would be occasioned by the arrival of the new millennium, there has been only an epidemic of “biohoaxes” and several relatively minor “biocrimes”, confined almost entirely to the US. Nothing has come to light that would contradict the 1996 assessment of the Federal Bureau of Investigation, reaffirmed in July 1999, that:

Our investigations in the United States reveal no intelligence that state sponsors of terrorism, international terrorist groups, or domestic terrorist groups are currently planning to use these deadly weapons in the United States.

Continued surveillance to deter and forestall terrorist violence and contingency plans to limit and ameliorate the consequences if it should occur certainly merit the attention and resources of government. But sensationalist publicity is at odds with the historical record.

Whatever the reasons — and several have been put forward — the use of disease and poison as weapons has been extremely limited, despite the great number of conflicts that have occurred since the underlying technologies of the weapons became accessible. Human beings have exhibited a propensity for the use, even the veneration, of weapons that bludgeon, cut, or blast, but have generally shunned and reviled weapons that employ disease and poison. We may therefore ask if, contrary to the history of other major technologies, the hostile exploitation of biotechnology can be averted.

The factor that compels our attention to this question is the possibility that any major turn to the use of biotechnology for hostile purposes could have consequences qualitatively very different from those that have followed from the hostile exploitation of earlier technologies. Unlike the technologies of conventional or even nuclear weapons, biotechnology has the potential to place mass destructive capability in a multitude of hands and, in coming decades, to reach deeply into what we are and how we regard ourselves. It should be evident that any intensive exploitation of biotechnology for hostile purposes could take humanity down a particularly undesirable path.

Whether this happens is likely to depend not so much on the activities of lone misanthropes, hate groups, cults, or even minor states as on the policies and practices of the world’s major powers.

In the United States, there was abrupt and remarkable change — from nearly thirty years of being deeply engaged in the development, testing, and production of biological weapons to the dramatic and unconditional US renunciation of biological weapons declared by President Nixon in November 1969 and the US renunciation of toxins three

months later. Today the former US offensive biological weapons programme and the logic behind its abolition are largely forgotten, although there are valuable lessons to be learned from both.

During World War II, research, development, and pilot-scale production of biological weapons was centered at Fort (then Camp) Detrick, in Maryland. Large-scale production was planned to take place at a plant near Terre Haute, Indiana, built in 1944 for the production of anthrax spore slurry and its filling into bombs. Equipped with twelve 20,000-gallon fermentors, it was capable of producing fill for 500,000 British-designed 4-pound anthrax bombs a month. Although the United Kingdom had placed a large order for anthrax bombs in 1944 and the plant was ready to go into weapons production by the following summer, the war ended without it having done so.

Contrary to the view that biological weapons are easy to develop and produce, by the end of the war Fort Detrick comprised some 250 buildings and employed approximately 3,400 people, some engaged in defensive work but many in the development and pilot production of weapons. Several years after the end of the war, the Indiana plant was demilitarized and leased to industry for production of antibiotics. It was replaced by a more modern and flexible biological weapons production facility constructed at Pine Bluff Arsenal, in Arkansas, which began production late in 1954 and operated until 1969.

A major effort of the 1950s was encompassed under Project St. Jo, a programme to develop and test anthrax bombs and delivery methods for possible wartime use against Soviet cities. In order to determine quantitative munitions requirements, 173 releases of noninfectious aerosols were secretly conducted in Minneapolis, St. Louis, and Winnipeg — cities chosen to have the approximate range of conditions of climate, urban and industrial development, and topography that would be encountered in the major potential target cities of the USSR. The weapon to be used was a cluster bomb holding 536 biological bomblets, each containing 35 millilitres of anthrax spore slurry and a small explosive charge fuzed to detonate upon impact with the ground, thereby producing an infectious aerosol to be inhaled by persons downwind.

In later years, a strain of the bacterial pathogen of tularemia, less persistent and with an average human infectious dose more reliably known than that for anthrax spores, was standardized by the US military as a lethal biological agent. Other agents — the bacteria of brucellosis, the rickettsia of Q-fever, and the virus of Venezuelan equine encephalomyelitis, all more incapacitating than lethal, as well as fungi for the destruction of rice and wheat crops — were also introduced into the US biological weapons stockpile, along with improved biological bomblets for high-altitude delivery by strategic bombers and spray tanks for dissemination of biological agents by low-flying aircraft. According to published accounts, these developments culminated in a major series of biological weapons field tests using various animals as targets, conducted at sea in the South Pacific in 1968.

Soon after Richard Nixon became president, a comprehensive review was undertaken of US biological weapons programs and policies — which had been unexamined

and unanalyzed by policy makers for fifteen years. Each relevant government department and agency was instructed to present its evaluation of the arguments for and against each of several options, ranging from retention of the offensive BW programme to its entire abolition. Following this review, the president announced that the United States would unilaterally and unconditionally renounce biological weapons. The US biological weapons stockpiles were destroyed and the facilities for developing and producing them were ordered dismantled or converted to peaceful uses. President Nixon pledged that the US biological programme would be restricted to “defensive purposes, strictly defined”. He also declared that, after nearly 50 years of US recalcitrance, he would seek Senate agreement to US ratification of the 1925 Geneva Protocol prohibiting the use in war of chemical and biological weapons. In addition, he announced US support for an international treaty proposed by the United Kingdom, banning the development, production, and possession of biological weapons, leading to the Biological Weapons Convention (BWC) of 1972.

It is important to note that these US decisions went far beyond the mere cancellation of a programme. They renounced, without prior conditions, even the option to have biological and toxin weapons. What was the underlying logic?

First, it had become evident through the results of the US biological weapons programme that deliverable biological weapons could be produced that, although subject to substantial operational uncertainties, would be capable of killing people, livestock, and crops over large areas.

Second, it was realized that the US biological weapons programme was pioneering a technology that, although by no means simple to bring into existence, could be duplicated by others with relative ease, enabling a large number of states to acquire the ability to threaten or carry out destruction on a scale that could otherwise be matched by only a few major powers. The US offensive programme therefore risked creating additional threats to the nation with no compensating utility or benefit and would undermine prospects for combating the proliferation of biological weapons.

The clear policy implication, reinforced by widespread abhorrence for any use of disease as a weapon, was that the United States should convincingly renounce biological weapons and seek to strengthen international barriers to their development and acquisition. The US renunciation of biological weapons was seen as a major step away from a universal menace. As wisely expressed by President Nixon, “Mankind already carries in its own hands too many of the seeds of its own destruction.”

The BWC entered into force in 1975 — the first worldwide treaty to prohibit an entire class of weapons. The Convention now has 143 states parties, the most important holdouts being in the Middle East. Unlike the Chemical Weapons Convention (CWC) of 1993, it has no organization, no budget, no inspection provisions, and no built-in sanctions — only an undertaking by its states parties 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.

The significance of the BWC lies in its statement of a clear norm — reinforced by international treaty — prohibiting any exploitation by states of biological agents and toxins for hostile purposes. It is important to note that its prohibition of biological agents and toxins for all but “peaceful purposes” and its reference not only to “armed conflict” but, more generally, to “hostile purposes” make the BWC applicable not only to hostile purposes of a state directed against another state but also to hostile purposes of a state directed against its own citizens or anyone else. Thus, the BWC embodies an international norm and provides a legal bulwark against the exploitation of biotechnology by states for hostile purposes whether in armed conflict or in any other circumstance.

While the US renounced biological weapons and abided by the BWC, the Soviet Union did not. According to statements by officials of the former Soviet programme, it was believed that the US renunciation was a hoax, intended to hide a secret offensive programme. Aware of the post-war US biological weapons programme and of the dynamic US lead in molecular biology and biotechnology, the Soviet Union continued and intensified its preparations to be able to employ biological weapons on a large scale.

An example was the standby facility built in the early 1980s for the production of anthrax bombs at Stepnogorsk, in what is now the independent republic of Kazakhstan. Recently dismantled in cooperation with Kazakhstan under the US Cooperative Threat Reduction Program, it was equipped with ten 20,000-litre fermentors, apparatus for the large-scale drying and milling of the agent to a fine powder, machines for filling it into bombs, and underground facilities for storage of filled munitions. According to its Cold War deputy director, the facility conducted numerous developmental and test runs but never produced a stockpile of anthrax weapons. Nevertheless, there is no doubt that its purpose was to provide a capability to commence production on short notice if ordered to do so.

Field testing of Soviet aircraft and missile delivery systems for biological agents was conducted on Vozrozhdeniye Island in the Aral Sea. In a 1998 interview with a Moscow newspaper, the general in charge of Russian biological defence is quoted as saying that activities at the test site in the 1970s and 1980s were “in direct violation of the anti-biological treaty”.

The Russian Federation has done little to convince other nations that the military core of the Soviet biological weapons programme has been dismantled. The former Soviet biological weapons facilities at Ekaterinburg, Sergiyev Posad, and Kirov remain closed to foreigners. The US-Russian-British discussions that had achieved agreement on the principle of reciprocal visits to each other’s military biological facilities as a means of resolving ambiguities have foundered and are in abeyance. Resolving the problem and establishing conditions that will allow the two nations to cooperate in fostering global compliance with the BWC will require that the matter be accorded high priority on the agenda of US–Russia dialogue.

At present, we appear to be approaching a crossroads — a time that will test whether biotechnology, like all major predecessor technologies, will come to be intensively exploited for hostile purposes or whether instead our species will find the collective wisdom to take a different course. An essential requirement is international agreement that biological and chemical weapons are categorically prohibited. With the BWC and the CWC both in force for a majority of states, including all the major powers — and notwithstanding the importance of achieving full compliance and expanding the membership of both treaties still further — the international norm of categorical prohibition is clearly established.

The CWC, now with 135 states parties, prohibits the development, production, acquisition, retention, transfer, and use of chemical weapons. Like the BWC, its prohibitions are purpose-based, so that a toxic chemical or precursor intended for peaceful purposes, so long as its type and quantity are consistent with such purposes, is not a chemical weapon within the meaning of the Convention. As with the BWC, this criterion for what is and what is not prohibited, termed the General Purpose Criterion, is intended both to avoid hampering legitimate activities and to help keep the Convention from becoming outmoded by technological change. Also like the BWC, the language of the CWC is applicable not only to prohibited weapons intended for use against another state but also to such weapons intended by a state for use against anyone.

The stringent verification provisions of the CWC, designed with the active participation of the chemical industry, require initial declaration of chemical weapons and chemical weapons production facilities and subsequent verification on-site of the correctness of the declarations. Declared chemical weapons and chemical weapons production facilities must be secured and are subject to routine inspection until they are destroyed and such destruction must be verified on-site. Facilities that produce more than designated amounts of certain chemicals deemed to be of particular importance to the objective of preventing diversion for chemical weapons purposes must be declared annually and are subject to inspection. Suspect sites, whether declared or not, are subject to short-notice challenge inspection under managed access procedures designed to protect legitimate confidential information and to avoid abuse. All inspections are conducted by experts of the Technical Secretariat of the Organization for the Prohibition of Chemical Weapons (OPCW), the international operating arm of the CWC headquartered in The Hague. In the three years since April 1997, when the CWC entered into force, there have been nearly 700 inspections at declared sites. These include 60 chemical weapons production facilities in nine states (China, France, India, Iran, Russia, the UK, the USA, and one other and the Aum facility in Japan) and 31 chemical weapons storage sites in four states (India, Russia, the USA, and one other), holding 8.4 million chemical munitions and bulk containers, most of them in Russia and the US.

In Geneva, the Ad Hoc Group of States Parties to the BWC is negotiating a protocol to strengthen the Convention, including measures for verification. There is general agreement that there should be an international operating organization similar to the Technical Secretariat of the

OPCW and that there should be initial declarations of past offensive and defensive BW activities and of current biodefence programs and facilities, vaccine production facilities, maximum containment facilities, and work with listed agents. It is also generally agreed that there should be provision for challenge investigation at the request of a state party, including investigation on-site, of suspected breach of the Convention.

In order to encourage accuracy in declarations and to help deter prohibited activities from being conducted under the cover of otherwise legitimate facilities, some states believe that declared facilities should be subject to randomly-selected visits by the international inspectorate, using managed access procedures to protect confidential information, similar to those practiced under the CWC. Other states and certain pharmaceutical trade associations have so far opposed such on-site visits. Other important matters, including the scope and content of declarations, the procedures for clarifying ambiguities in declarations, the substantive and procedural requirements for initiating an investigation, measures for assistance and protection against biological weapons, measures of peaceful scientific and technological exchange, and provisions affecting international trade in biological agents and equipment also remain to be resolved and are the subject of intense negotiation.

What can international treaties like the CWC and a strengthened BWC accomplish? First, they define agreed norms, without which arms prohibitions cannot succeed. Second, their procedures for declarations and on-site visits, monitoring, and investigation, including challenge investigation, pose the threat of exposing noncompliance and cover-up, creating a disincentive for potential violators and increasing the security of compliant states. Third, these same procedures have the potential to resolve unfounded allegations and to counteract erroneous or mischievous allegations. Fourth, the legal obligations and national implementation measures of such treaties act to keep compliant states compliant, even when they may be tempted to encroach at the limits, or to ignore violations out of political expediency. Fifth, treaty-based regimes legitimate and facilitate international cooperation to encourage compliance and to take collective action against violators, thereby enhancing deterrence. And sixth, as membership in the treaty approaches universality and its prohibitions and obligations enter into international customary law, holdout states become conspicuously isolated and subject to penalty.

In sum, a robust arms prohibition regime like that of the CWC and the BWC strengthened by the kind of protocol that one may hope will emerge from the present negotiation serve both to insure vigilance and compliance by the majority who are guided by the norm and to enhance the deterrence of any who may be disposed to flout it.

The prohibitions embodied in the BWC and the CWC are directed primarily to the actions of states, not persons. Both conventions enjoin their states parties to take measures, in accordance with their constitutional processes, to insure compliance anywhere under their jurisdiction, including a provision in the CWC obliging its parties to enact domestic penal legislation to this effect and to extend it to cover prohibited acts by their own nationals wherever such acts are committed. Nevertheless, important as such do-

mestic legal measures can be, neither the CWC nor the BWC seeks to incorporate its prohibitions into international criminal law, applicable to individuals whatever their nationality and wherever the offense was committed.

Recently, interest has developed in the possibility of enhancing the effectiveness of the BWC and the CWC by making acts prohibited to states also crimes under international law. A treaty to create such law has been drafted by the Harvard Sussex Program, in consultation with an international group of legal authorities (see CBWCB 42, December 1998). It is patterned on existing international treaties that criminalize aircraft hijacking, theft of nuclear materials, torture, hostage taking, and other crimes that pose a threat to all or are especially heinous. Such treaties create no international tribunal; rather their provisions for adjudication, extradition, and international legal cooperation are aimed at providing enhanced jurisdiction to national courts, extending to specific offences committed anywhere by persons of any nationality. The proposed treaty would make it an offence for any person — including government officials and leaders, commercial suppliers, weapons experts, and terrorists — to order, direct, or knowingly render substantial assistance in the development, production, acquisition, or use of biological or chemical weapons. Any person, regardless of nationality, who commits any of the prohibited acts anywhere in the world would face the risk of prosecution or extradition should that person be found in a state that supports the proposed convention. Such individuals would be regarded as *hostes humani generis* — enemies of all humanity.

International criminal law to hold individuals responsible would create a new dimension of constraint against biological and chemical weapons. The norm against using chemical and biological agents for hostile purposes would be strengthened, deterrence of potential offenders, both official and unofficial, would be enhanced, and international cooperation in suppressing the prohibited activities would be facilitated.

What we see here—the non-use of biological and chemical weapons; the opprobrium in which they are generally held; the international treaties prohibiting their development, production, possession, and use; the mandatory declarations and on-site routine and challenge inspections under the CWC; the negotiations that may lead to strengthening the BWC with similar measures; and the possibility of an international convention to make biological and chemical weapons offenses crimes under international law, subject to universal jurisdiction and applicable even to leaders and heads of state—suggests that it may be possible to reverse the usual course of things and, in the century ahead, avoid the hostile exploitation of biotechnology. Doing so, however, will require wider understanding that the problem of biological weapons rises above the security interests of individual states and poses an unprecedented challenge to all.

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REGIMES, DEFENCE AND DETERRENCE

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The focus of this essay is on the question of how to respond if chemical or biological weapons are used, a question which is more complicated than it might at first appear, and to which there are no easy or straightforward answers. As stated, the question is very broad. For example, it is not clear who the perpetrator might be: a state; a terrorist organization; or a source that cannot be identified? What about the nature of the circumstances and scope of use of chemical or biological weapons: are we speaking of a massive attack against civilian populations; or a limited attack against military installations or units? Is it in the context of an on-going conflict or in apparently peacetime circumstances and totally unanticipated? These and other similar questions would have to be considered in order to reach conclusions on whether and where and how to respond. The discussion that follows assumes that the perpetrator is a state.

There are many aspects to the question of responding to uses of chemical and biological weapons. A major concern is how to deal with the possible use of such weapons against a nuclear-weapon state, its allies and friends, or its personnel outside its national territory, and more particularly whether nuclear weapons can or should be contemplated as part of a strategy of response. Any effort to answer this question also should consider threats of use and how to maximize the probability that such weapons will not be used in the first instance. The argument here is that the best chance to avoid the use of chemical and biological warfare (CBW) and to discourage even their acquisition lies in a broad array of measures including *regime strengthening*, *defensive measures* and *deterrence*.

Regimes

We start from the proposition that the strongest foundation for preventing the use of CBW weapons is universal adherence to, and compliance with, international treaties and agreements designed to prevent their possession and proliferation. Given this assumption, a first order priority is a focus on existing treaties, conventions and regimes and an emphasis on identifying their strengths and weaknesses, further consolidating and building on their strong points, and remedying their weaknesses. Regimes establish standards of expected behavior supported by formal and informal rules and procedures for dealing with the issues for which they were established. They also provide a foundation for assembling political coalitions to respond to violations of or threats to the regime.

Contractual and consensual regimes, unlike imposed ones, are born out of shared or convergent interests and the conclusion of their constituents that national interests in the area in question are better served by cooperation than by conflict. The broader and more committed their member-

ship, the greater will be the likelihood that regimes can accommodate to changed circumstances and provide a framework within which their constituent members can continue cooperative behaviour — and the greater their potential legitimacy (i.e., the belief that the norms, rules and principles they embody are authoritative and require compliance), the greater will be their potential for contributing to shaping national decisions and actions. Regimes that prohibit chemical and biological weapons gain additional strength from the fact that the use of poison and disease as weapons is widely regarded as particularly abhorrent and, in the words of the 1925 Geneva Protocol are “justly condemned by the general opinion of the civilized world”.

Regimes related to weapons of mass destruction and their means of delivery are not equally well developed or of comparable impact. Among these regimes, the nuclear non-proliferation regime, which includes several major treaties, a wide network of multilateral and bilateral agreements and institutions, and corresponding national laws and regulations, is the strongest and most comprehensive. Only four states now remain outside the nuclear Non-Proliferation Treaty (NPT), the treaty on which the regime is anchored. One of them, Cuba, is a signatory of the Treaty of Tlatelolco which establishes a nuclear weapon free zone in Latin America that is functionally equivalent to the NPT. There is a widely held view that the near-universality of membership in the NPT has an impact on the behaviour even of non-parties, providing an additive constraint to open proliferation and reinforcement for the arguments of national elites who oppose the acquisition of nuclear weapons by their government. While this has been largely borne out in fact, India’s and Pakistan’s decisions to conduct a series of nuclear tests in 1998 demonstrate the limits of the assumptions underlying this view.

The Chemical Weapons Convention (CWC), which entered into force in April 1997, is rapidly acquiring comparable status, although it still has less of an operational history than the NPT. The Convention seeks the outright elimination of chemical weapons worldwide, prohibiting all chemical weapons development, production, acquisition, transfer and use. Its robust verification provisions include requirements for initial declarations of all chemical weapons and their production facilities and annual declarations of facilities that produce certain chemicals and precursors that could be diverted for chemical weapons purposes. In order to verify the declarations, the Organization for the Prohibition of Chemical Weapons (OPCW), created under the CWC, conducts mandatory inspections of declared weapons and facilities and, if requested by any state party, is empowered to conduct short-notice challenge inspections of suspect sites, whether public or private. The Convention further requires its states parties to establish national implementation authorities and to enact national legislation

criminalizing violations of the CWC, provisions that help reach into the social fabric of societies and address sub-national and terrorist threats. Considering that the CWC has been in force for just over three years, it has a considerable record of achievement. By early May of this year, 135 of its 171 signatories had become parties to the CWC, including many but not all of the countries of concern in the area of chemical weapons proliferation. The Technical Secretariat of the OPCW has conducted 685 on-site inspections at 336 declared sites in 35 states parties. Sixty chemical weapons production facilities have been declared by nine states parties and have been or will be destroyed or converted under OPCW verification. And the world's declared stockpile of 70,000 metric tons of chemical agents in eight million munitions or containers are now under continuous OPCW monitoring, pending their eventual destruction.

The 1972 Biological Weapons Convention, like the CWC, enjoins its 161 signatories, including 143 parties, not to develop, produce, acquire, retain or transfer any microbial or other biological agents, or toxins of types and in quantities that have no justification for peaceful purposes or any weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes. Unlike its sister treaties on nuclear and chemical weapons, however, the BWC lacks verification arrangements or intrinsic means by which to assess compliance with undertakings. This is widely regarded as a serious deficiency in a technological sector where the problem of dual-use makes it difficult to draw a bright line between permitted and prohibited activities. Of the three weapons of mass destruction regimes it is the weakest and the most in need of strengthening, especially since biological weapons may be seen as the alternative weapon of choice to nuclear weapons by states contemplating acquisition of a weapon of mass destruction.

None of these treaties is perfect; certainly none can alone claim to account for and control state behaviour. But a robust regime can be a significant element in shaping how national decision-makers define their interests, approach policy choices, and make decisions. The very act of participating in regime-based negotiations and interactions can affect how those involved see and interpret the world around them. And this in turn can alter perceptions and in this way qualify the options that a decision-maker may consider to be plausible in responding to a situation in which choices must be made.

The NPT makes no specific provision for dealing with non-compliance. That is either up to states parties to the Treaty who could decide to take some sort of action against the perpetrator consistent with their obligations under the UN Charter, or the UN Security Council itself. In the aftermath of the revelations about Iraq's nuclear programme the President of the Security Council, speaking for the Council in summit session in January 1992, stated:

The proliferation of all weapons of mass destruction constitutes 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.

This critical phrase in the Security Council Statement opens the door to Chapter VII of the Charter under which

decisions can be taken to use force against a violator. The statement also included reference to violations of IAEA safeguards suggesting that where such violations occur the Security Council could consider them as tantamount to a threat to peace and security.

The NPT has not been trouble free, but from 1968 when it was opened for signature until the decision of India and Pakistan to defy both the comprehensive test ban treaty and the norm of non-proliferation by conducting nuclear tests and asserting themselves to be nuclear-weapon states, the number of declared nuclear weapon states remained constant, a number of states abandoned programmes devised to acquire nuclear weapons (South Africa, Argentina and Brazil) or relinquished weapons inherited from the dissolution of the former Soviet Union (Belarus, Kazakhstan, Ukraine) and joined the NPT, leaving only three principal undeclared nuclear-capable states (India, Israel and Pakistan) outside the Treaty. Even the number of cases of behaviour by parties inconsistent with their Treaty commitments has been limited (Iraq, North Korea) and elicited condemnatory response by the international community although some states have wavered in maintaining unyielding pressure to achieve full compliance. This is true despite the fact that nuclear technology has spread widely during this period and the number of states capable of making good a political decision to acquire nuclear weapons has grown from perhaps a dozen to close to thirty. Challenges to the regime by Iraq and North Korea have resulted in concerted efforts to strengthen it by introducing enhanced safeguards capabilities for the verifying institution, the IAEA, and agreement among the members of the Nuclear Suppliers Group, which includes all but one of the major suppliers of nuclear equipment, components and technology, to require comprehensive safeguards as a condition of supply to any non-nuclear-weapon state.

The CWC, unlike the NPT, does make explicit provision for non-compliance, including prohibiting the export of dual use chemicals to violators. And even states that simply do not join the Convention, even if they are not engaged in illicit activities, are denied access to certain treaty-controlled chemicals. Where there is a concern about compliance, the Executive Council of the OPCW can call upon a state to fulfill its obligations and take any measures necessary to bring itself into compliance and, if appropriate action is not taken, refer the case to the CWC Conference of the States Parties which can take a range of actions — from restricting rights of the delinquent party under the Convention to referring the situation to the United Nations Security Council and General Assembly. Hence, regimes can have teeth that can bear on how states behave.

In the case of the BWC, the weakest of the three regimes, the absence of verification arrangements limits the contribution that the Convention, as it currently exists, can make to national security. Efforts have been underway for some time to identify and introduce confidence-building measures leading to the adoption of a number of such measures at the 1986 and 1991 review conferences. In 1994, a Special Conference of states parties decided to establish an Ad Hoc Group to consider appropriate measures, including verification measures, to strengthen the BWC, to be included in a legally binding protocol to the Convention. Now

in an advanced stage of negotiation, the Ad Hoc Group has elaborated a rolling text of a draft protocol that includes, *inter alia*, provisions requiring initial declarations of past offensive and defensive activities and annual declarations of current biodefence activities, facilities that work with listed agents, vaccine production facilities, and certain other facilities. The draft protocol also includes provisions for on-site visits by international inspectors to declared facilities, provisions for the clarification of declarations, and procedures for challenge investigations in cases of suspected non-compliance.

The complexities associated with the biotechnology industry, including the dual-use character of facilities, equipment and materials have led some to conclude that the avenue of regime strengthening is too fraught with problems to offer a credible and effective means for forestalling the threat of biological weapons proliferation. But rather than accepting the conclusion that the complexity of controlling BWC dictates deploying energy and resources elsewhere, we should take this as a challenge to devise means by which to build constraints against non-normative behavior, increase confidence, and enhance the role of the Convention and its supporting measures in reducing the risk of biological weapons acquisition or use even on the part of those who are not parties to the convention.

Justification for undertaking this effort rests on the already mentioned value that regimes can have on the defining of national interests, the perception of costs and benefits of particular courses of action, even for non-parties, and in providing a legal and political foundation for taking responsive measures to deter or punish a violator. In addition, as provided for in the Ad Hoc Group rolling text, the BWC can be strengthened by requiring states to criminalize prohibited activities through domestic legislation. As indicated earlier, strengthening the regime through multilaterally binding measures should not be viewed as a singular approach but as an element of a broader strategy to diminish the contingency that biological (or chemical) weapons would be acquired or used.

If it is evident that the regimes dealing with weapons of mass destruction have some deficiencies and limitations, it is no less clear that they remain critically important factors in the effort to thwart use or the threat of use of weapons of mass destruction. Their normative value should not be underestimated. Nor should the fact that without them the world would be an ever more dangerous place. Their Achilles Heel can, but need not be, enforcement of compliance. The international entity common to all three treaties discussed in this regard is the UN Security Council. The question here is the existence of political will sufficient to override the eclectic interests of the key members of the Council and, most importantly, its five permanent members. The Council made common cause with respect to Iraq, and while there were differences over how to respond to the North Korean crisis, there was no difference over the necessity to respond and to keep Pyongyang in the NPT, fulfilling its undertakings with respect to IAEA safeguards and to non-proliferation. While there is debate over how far non-proliferation and arms control regimes can carry us in averting or responding to threats or use of CBW weapons, at the very least their perceived limits point to the relevance of de-

fence and deterrence which remain key ingredients in efforts to deal with the CBW threat.

Defence

There is widespread agreement among those who focus on CBW issues that robust defences, both passive and active, are of particular importance for dealing effectively with threats or use of chemical and biological weapons. If the aggressor's objective for using or threatening to use chemical or biological weapons is to convince his adversary not to resist, or to stand down from on-going resistance, or to dissuade an out-of-region actor not to intervene on behalf of the state being attacked, then the ability of those under attack to withstand the impact of these weapons, to fight through adverse conditions, and to continue to pursue their military or political objectives, may deter the aggressor from taking the fateful step of unleashing a CBW attack. Effective defence capabilities to offset chemical and biological weapon systems can result in devaluing any potential political or military benefits the use or threat of use of those weapons might have provided the aggressor.

If it can be made clear from the outset that use of these weapons will be of only limited value because the adversary is capable of defeating their utility by timely detection of their presence and prompt implementation of protective devices such as gas masks, protective clothing, medical antidotes, or other barriers, an aggressor may conclude that their use would yield limited benefits that would not be worth the costs he may incur from his action. A well publicized capability to effectively defend against CBW attacks, and the sharing of these capabilities with those threatened by CBW weapons in the crisis situation that is the source of concern, might contribute to dissuading or deterring an aggressor from using them in the first place, and, failing that, at least serve to limit their impact in terms of casualties if they are used. Two caveats apply here. One is that technical and financial constraints may place real limits on timely detection and other passive defence measures. The other is that what has been said here relates to protecting military personnel in the field or at specific sites such as military establishments and bases. The problems are compounded when one seeks to extend defensive measures to large civilian populations in metropolitan areas that might be the objective of CBW attack.

Defence includes not only passive, but also active measures, that is to say measures designed to interdict weapons before they reach their targets. A growing number of countries, among them states that possess or have clandestine programs underway to acquire weapons of mass destruction, have cruise missiles and/or theater ballistic missile capability. It is therefore not surprising that missile proliferation has come to be viewed with as much concern today as the spread of weapons of mass destruction capabilities. Regime-based efforts to control the spread of missiles and missile technology are based on the Missile Technology Control Regime which, unlike the other regimes discussed, is a voluntary arrangement among suppliers in the nature of a policy commitment rather than a binding treaty in which parties agree not to supply or to seek to acquire or to produce missiles. Active defence can be critically important

when confronted with an adversary capable of delivering CBW on any target at any time, taking the victim by surprise and very possibly by-passing passive defence capabilities. Active defence in the form of a capacity to destroy CBW missiles in boost phase before multiple submunitions can be released and resulting in warheads disintegrating over the attacker rather than the intended victim can be a particularly important component of active defence. Cruise missiles, which are more widely available and more effective delivery platforms for CBW than ballistic missiles, are of special concern.

The central point for us is that active defences include the ability to meet at some level the threat of missiles capable of carrying chemical or biological warheads. An inability to do so could severely compromise efforts to deal with regional aggression in circumstances involving a state with CBW weapons and the ability to deliver them with missiles. Host states for a coalition to respond to threatened or actual aggression might be reluctant to allow out-of-region countries to base aircraft or troops on their territory, thus taking away the potential for even conventional responses to dissuade aggression. This brings us to the third aspect for addressing use or threat of use of CBW, deterrence.

Deterrence

An aggressor contemplating use of CBW in a conflict must take into consideration that unleashing such weapons will evoke potentially very strong counter-measures and response. The nature and degree of response would be related to the circumstances of their use, whether military or civil targets were selected, whether it was a limited or strategic attack, and other considerations. This is where deterrence comes in.

Deterrence by threatened retaliation is a third means for dealing with the use (or threat of use or even the acquisition) of chemical or biological weapons. Unlike defence (i.e., deterrence by denial) which banks on convincing the aggressor that a CBW attack is futile because the opponent's active defences will intercept this and his passive defences will enable him to resist or absorb whatever gets through and prevent the aggressor achieving his objective, deterrence is achieved through the threat of retaliation.

To be persuasive, deterrence through threatened retaliation requires both capability and credibility on the part of the states seeking to dissuade aggression. It is here that a simple concept can get very complex. Capability can be objectively assessed: does the state threatening punishment have the military, logistical and related resources to retaliate with such force and effectiveness as to nullify any gains that might have been made through aggression? Credibility — whether the state threatening retaliation is perceived as having the will to carry out such threats — is more difficult to assess because it involves subjective considerations of a political or psychological nature and, as in the case of alliances between nuclear and non-nuclear-weapon states in the current age, questions of alliance partner expectations and tolerances.

Threats to respond to any state use of CBW under any circumstance, against any target, and at any level, in an overwhelming and devastating manner may well not be

viewed as credible by a would-be aggressor—and might create a political climate that would unwisely pre-commit the responding state to a course of action inappropriate to the situation at hand. Moreover, if a state were to test the threat and learn that the result was the drawing of another red line the crossing of which would allegedly elicit another threatened overwhelming and devastating response he might well not be inclined to take it seriously. The end result could be a loss of credibility and confidence in commitments all around with the result of a more unstable and uncertain international environment than existed before.

Going a step further, the targets of deterrent threats may not react consistent with the pattern of US–Soviet deterrence during the cold war. The stakes of the aggressor and defender may be quite different — survival in the one case and more limited concerns in the other — and the former may be willing to risk considerably more than the latter to secure his interests. Or, for want of strategic understanding, the state against which deterrence is being practiced may fail to comprehend the linkages that are being made in a deterrent threat, resulting in unintended outcomes of behaviour; or those involved may not operate on the same basis of rationality that underpinned deterrence as we defined and practiced it in the Cold War years. Of course, the asymmetry may work the other way — the aggressor may be seeking to get what it can without having to confront Armageddon, while the defender may interpret events as challenges to its very survival thus altering the balance of risks and responses suggested above. The point is that asymmetries along these lines may have a significant bearing on how deterrence plays out. Considerations of this kind underscore the need for a more eclectic and discriminate approach to deterrence as a strategy for dealing with CBW threat and use.

Deterrence through retaliation can be based on a variety of means, including, for some states, even nuclear means. Having at hand a credible capability across a spectrum of forces optimizes the potential effectiveness of deterrence. There is, however, an argument, reflected in the report of the 1996 Canberra Commission and in the 1997 report of the National Academy of Sciences on *The Future of U.S. Nuclear Weapons Policy*, among others, that in the post Cold War environment, nuclear deterrence should be limited to deterring a nuclear attack or the threat of such an attack, and not be applied to conventional, chemical or biological threats or attacks. One danger is that emphasis on nuclear weapons as a counter to CBW can provide presently non-nuclear states that feel themselves to be threatened by CBW weapons with an incentive to go nuclear. Despite the desirability of de-emphasizing the role of nuclear weapons in international relations so as to inhibit their further proliferation, it is arguable that not only might *a priori* ruling out the use of nuclear weapons against *any* magnitude of CBW use by *any* perpetrator under *any* circumstances be premature and imprudent, but that even if such an undertaking were agreed the possibility of nuclear reprisal would not disappear. While this possibility may always lurk in the background, there does not seem to be any substantial value added — and possibly serious costs incurred — by articulating explicit declaratory policies of non-use that might encourage risk taking by an actor who, faced with uncertainty

about the nature and scope of response to use of CBW, might choose caution over adventurism. Ambiguity of this kind raises questions about the validity of negative security assurances to NPT parties and to parties to nuclear-weapon-free zone treaties which include protocols to which the nuclear-weapon states have subscribed. The issue was raised explicitly in the context of US Senate hearings on ratification of the CWC and subsequently in discussions about the Pelindaba Treaty (African Nuclear-Weapon-Free Zone) because of concern about alleged Libyan efforts to build a CW production facility at Tarhuna. Secretary of Defense Perry's comment that the use of CW weapons against the US or its allies would be met by a devastating and overwhelming response but that the US would not specify in advance the nature of its response has led to speculation that this effectively voids the negative security assurances. However, the above remarks are not an argument for using or planning the use of nuclear weapons in response to CBW use; they are an argument for not unequivocally ruling out their possible use and for leaving the would-be perpetrator of a CBW attack to ponder the incalculable risks he may run by launching such weapons.

The Cold War is over and classic nuclear deterrence no longer fits the international environment. But the end of the Cold War also has opened up new threats and challenges that are being addressed and that focus heavily on consolidating and expanding nuclear non-proliferation and working toward the goal of the ultimate elimination of nuclear weapons. We are, however, still in a transitional stage between the cold war and a future world order whose contours and characteristics still remain to be determined. Proliferation remains a serious threat particularly with respect to chemical and biological weapons and the spread of missile and missile development capabilities. Conventional deterrence may in fact suffice in most cases, but as stated earlier, it is at least not yet on its own a necessarily adequate response. It would seem that in this environment, for the near term, retaining a threat that leaves something to chance is a preferred strategy that can help to minimize the risk of imprudent adventurism on the part of aggressive states with agendas for radical change.

Conclusion

No single measure or approach alone can suffice to deal effectively with the problem of chemical or biological weapon use or threat of use. Rather, all three approaches are needed to forge a strategy that offers the best chance of averting CBW acquisition and use: defences that deter use by denying the user of any decisive gain while incurring the wrath and response of the victim or the broader community of nations; deterrence through threat of retaliation with whatever level of force is deemed necessary even to the point of being devastating and overwhelming; and non-proliferation/arms prohibition regimes that serve to organize and shape the way in which the international community will address the existence of such weapons, define the norms of behavior to which nations should adhere, provide the foundations on which to build confidence regarding the actions and intentions of others, help to remove incentives of states to want to acquire such weapons in the first place, and establish the basis for mobilizing international responses to those who defy or threaten to defy the will of the community as reflected in these regimes.

Below the state, at the level of terrorists and other non-state actors, while deterrence and active defence measures do not meet the need, international regimes can by facilitating the building of normative frameworks and cooperative arrangements from which widespread national actions such as criminalizing defined activities and behaviour and controlling the availability of components and information necessary to acquire or produce odious devices offer a way forward in the international effort to achieve effective prohibition of chemical and biological weapons.

Lawrence Scheinman was Assistant Director, US Arms Control and Disarmament Agency, 1994–97. This article is based on a longer article by the author: "Possible responses to CBW attacks", in Jozef Goldblat (editor), Nuclear Disarmament: Obstacles to the Banishing of the Bomb, London/New York: I B Tauris, 2000.

Developments in the Organization for the Prohibition of Chemical Weapons

The period under review, from mid-March to early June 2000, was one of the more significant since the entry into force of the Chemical Weapons Convention. The third anniversary of the Convention on 29 April was occasion for a number of provisions strengthening the Convention to take effect. As of this date, states parties were prohibited from transferring Schedule 2 chemicals to, or receiving them from, non-states parties. The number of facilities liable for inspection by the OPCW increased after 29 April with the expansion of the inspection regime to cover plant

sites producing "discrete organic chemicals" (DOCs). The first DOC inspection actually took place at the end of May. Finally, 29 April was also the deadline by which states parties possessing chemical weapons were to have destroyed one per cent of their Category 1 stockpiles. The period under review also saw the convening of the Conference of the States Parties (CSP) for its fifth session. Of the many decisions taken by the CSP, perhaps the most significant were its decision to grant Russia an extension to the aforementioned deadline, the decision to re-appoint

Ambassador José Bustani for another four year term of office as Director-General, and two decisions related to the long-standing unresolved issue of low concentrations.

Four states, Kazakhstan, Colombia, Malaysia and the Federal Republic of Yugoslavia ratified or acceded to the CWC during the period under review, bringing the total number of states parties to 135.

Significant activity also took place with regard to the submission of initial declarations. Almost three years after it was due, the USA submitted its initial chemical industry declaration as required under Article VI of the Convention. Information on its Schedule 1 facilities and Schedule 2 plant sites was provided on 28 April, information on its Schedule 3 plant sites was submitted on 8 May, while the declaration of chemical production facilities handling DOCs will be submitted before the end of May. The first industry inspection in the USA occurred at a Schedule 2 plant site during the week of 8 May. Additionally, the Director-General was able to announce to the Conference that all the other remaining initial declarations, around 35 of them, had also been submitted, thanks to a joint political initiative by the Secretariat and some states parties.

Executive Council

During the period under review, the Executive Council held one regular session, its nineteenth, during 3–7 April. This was the first time the Council was addressed by the head of state of a state party, King Albert II of Belgium. The nineteenth session was also the last session with the members elected by the third session of the Conference and the chairman of the Council, Ambassador Ignacio Pichardo Pagaza (Mexico) finished his term. On 12 May the new members elected by the fourth session of the Conference began their two-year terms of office. The Council elected Mr Bernhard Brasack (Germany) as its chairman until 11 May 2001 and elected the representatives of Chile, Pakistan, Romania and South Africa as vice-chairmen.

The Council also met for two specially scheduled meetings, its ninth on 2 May and its tenth which met on 16 and 18 May. These meetings were scheduled primarily to consider revisions to the draft 2001 budget before it could be recommended to the Conference for adoption, but also to consider a number of other issues. The Council's next regular session, its twentieth, will meet during 27–28 June and is intended for the discussion of organisational issues.

Status of implementation of the Convention The Director-General did not submit a *Status of Implementation Report* (SIR) to the Council's nineteenth session. In his opening statement he proposed that, rather than submitting SIRs to each Council session, he would submit two in-depth reports each year. The *Verification Implementation Report* (VIR) would cover verification activities for the previous calendar year and would be published in April or May. The VIR for 1999 was actually circulated on 15 March as a Highly Protected document and will be considered by the Council's twentieth session. The second report would be an SIR submitted in late autumn in time to be considered by the last Council session of the year. This SIR would cover verification activities in the first half of the calendar year.

The Council also returned to the reporting of verification activities, particularly inspection results. A draft decision was submitted to its nineteenth session incorporating a format for the reporting of classified information on verification activities and unclassified information on Article X and XI activities to the Council. However, the Council could not reach consensus on the draft and decided to consider it further at its next session.

Destruction of chemical weapons The Council returned to its deferred consideration of Russia's request that it be granted an extension of the intermediate deadline for the destruction of Category 1 chemical weapons. Two events, directly related to the request, occurred in the period between the eighteenth and nineteenth Council sessions. During 21–25 March the chairman of the Council travelled to Russia accompanied by observers from four states parties. In Moscow, Ambassador Pichardo held discussions with the Director-General of the Munitions Agency, Mr Zinovy Pak, and the Deputy Foreign Minister, Mr Gregory Mamedov. On 24 March, the group visited the site of Russia's first CWDF at Gorny where they were given a site tour and briefed on progress in its construction. Ambassador Pichardo submitted a report on the trip to the Council's nineteenth session. On 31 March the Secretariat hosted an international meeting on assistance in the destruction of chemical weapons in Russia. Senior officials from the Russian ministries of foreign affairs, economy and defence and from the Munitions Agency attended the meeting along with representatives of donor countries and other interested states parties. During the meeting the delegates of Canada and Norway announced that their countries would also be providing assistance to the Russian destruction effort.

On the basis of the additional information provided by Russia since its request was first submitted in November 1999 and the report of Ambassador Pichardo's trip to Gorny, the Council decided to recommend that the Conference grant Russia's request to extend the deadline. This decision was based on a number of understandings, principally that Russia will complete the destruction of the required one per cent of its Category 1 munitions before the phase two deadline which falls on 29 April 2002. The decision also obliges Russia to report to each alternate regular Council session on the status of its plans and requires the Director-General and the Council chairman to report periodically to the Council on Russia's progress in the destruction of its chemical weapons. The Council also recommended that the Conference call upon all states parties in a position to do so, to provide assistance to the Russian destruction programme and call upon Russia to take additional measures to facilitate such international assistance.

The Director-General announced to the fifth session of the Conference that Russia had submitted new plans for the destruction of its entire Category 2 and 3 chemical weapons stockpile in late 2000 and 2001, including the powder and burster charges for its chemical munitions. The Director-General said that the destruction of these items would effectively take the Russian stockpile "off alert".

As reported in a previous quarterly review (CBWCB 45), the fourth session of the Conference had been unable to adopt a model facility agreement for Chemical Weapons

Destruction Facilities (CWDFs) and the issue continued to be discussed by the Council. The facilitator, Mr Mark Albon (South Africa), submitted a draft model agreement to the Council's tenth meeting which would apply to continuously operating facilities and, with modifications on a case-by-case basis, to non-continuously operating facilities. The Council adopted the decision and recommended it for confirmation by the Conference.

Old and abandoned chemical weapons The Council also heard reports on progress in the consultations on the "usability" guidelines for old chemical weapons (OCW) and on the attribution of costs related to the inspection of such weapons. However, the Council did not take decisions on either issue and decided to return to them at its next session. In his opening statement, the Director-General again stressed the importance of developing an integrated concept for the verification and destruction of OCW and abandoned chemical weapons (ACW). He also announced that, although the verification regime for OCW has not been fully elaborated, states parties are still obliged to provide the Secretariat with general and detailed annual plans for, and reports on, the destruction of OCW. In his statement to the fifth session of the Conference, the Director-General announced that, from 1 June, he would implement the provisional approach to the verification of OCW that he had outlined to the Council's eighteenth session. The Director-General's statement to the Council's nineteenth session revealed that, in accordance with the CWC, the Secretariat had submitted to the Council a report on the initial and subsequent inspections of declared ACW in China. The report had been submitted to both China and Japan and will be considered by the Council's twentieth session.

Requests for conversion of CWPFs At its nineteenth session, the Council returned to consideration of the three requests for the conversion of former CWPFs to peaceful purposes submitted by the UK and Russia to its eighteenth session. This time the requests were approved and recommended for adoption by the fifth session of the Conference.

Industry verification issues The Council's nineteenth session returned to the unresolved issue of guidelines for scheduled chemicals in low concentrations. Since the previous session, the facilitator, Mr Urs Schmid (Switzerland), had drafted a new decision dealing solely with the implementation of the transfer restrictions on Schedule 2 chemicals, which actually entered into force on 29 April. According to the draft, transfer restrictions would not apply to the following products: those containing one per cent or less of a Schedule 2A or 2A* chemical; those containing 10 per cent or less of a Schedule 2B chemical; and those identified as consumer goods packaged for retail sale for personal use or packaged for individual use. The CWC tasks the Conference to decide what measures to apply to the transfer of Schedule 3 chemicals after 29 April 2002 and the draft decision accordingly requests the Council to prepare a recommendation for the sixth session of the Conference on this subject. The security concerns expressed by some Council members regarding the draft decision were addressed in a number of ways. It was emphasised that the

critical element in the approach adopted is the packaging. This creates a "proliferation barrier" which makes the recovery of the scheduled chemical too difficult to be attractive to a proliferator. However, if security concerns should arise in the future, the Council will be informed immediately. It was also decided that the application of the decision would be reviewed at the first CWC review conference. After a statement by one delegation which still had reservations with the decision, the Council adopted the decision, for confirmation by the Conference.

The second aspect of the low concentrations issue, relating to plant site declarations, was the subject of a draft decision submitted by Mr Schmid to the Council's tenth meeting. According to this draft, declarations would not be required for mixtures of chemicals containing 30 per cent or less of a Schedule 2B or a Schedule 3 chemical. States parties would be given until 1 January 2002 to implement these guidelines. The draft recommended that the study of applicable concentration limits for mixtures containing Schedule 2A and 2A* chemicals be referred to the Scientific Advisory Board. The Board would then be expected to report its findings to the Council in order for it to submit a decision to the sixth session of the Conference. This draft decision was also adopted by the Council and forwarded for approval to the Conference. Seeing as the low concentrations issue has remained unresolved for many years, the adoption of these two decisions was a significant achievement.

The Council also had on its agenda issues relating to the implementation of DOC inspections. In accordance with the decision of the fourth session of the Conference, inspections to DOC plant sites can be initiated any time after 29 April. However, the Conference did not decide upon the methodology for the selection of such sites, so the issue was passed back to the Council. The facilitator, Mr Alain Jacquemet (France) submitted a draft decision to the Council's nineteenth session and a state party also submitted its proposed methodology. However, the Council was once again unable to reach consensus on this issue. The Director-General therefore stated that, in the absence of a decision, he will decide how to select such sites for inspection.

In relation to the criteria for making Schedule 2 and 3 industry declarations the Council's nineteenth session had before it a draft decision on rounding rules. Some states parties had previously expressed concern at inconsistencies in the application of rounding rules to declarations of scheduled chemicals. Therefore, according to the draft decision quantities should only be declared to three figures using specified units. The Council adopted the decision and requested the Secretariat to issue it, and other declaration-related decisions, in the Declaration Handbook on or after 1 April 2001 for implementation by states parties.

Re-appointment of the Director-General The Council's tenth meeting considered a proposal submitted by the Latin American and Caribbean Group that Ambassador José Bustani (Brazil) be re-appointed as Director-General of the OPCW when his current term expires in May 2001. Following a number of statements by Council members, the Council adopted the proposal, recommending that the Conference re-appoint Ambassador Bustani for one further four-year term of office from 13 May 2001 to 12 May 2005.

Financial issues The Secretariat had circulated the first draft of the 2001 budget on 8 February. This draft proposed a 17 per cent increase in the budget compared with the 2000 budget and the creation of 20 new fixed-term posts. One of the proposed new posts was at the D-1 level to head a newly created Information Systems Division, acknowledging the importance of information systems for the efficient functioning of the Secretariat. Following a series of informal consultations between states parties in late March, the Council's nineteenth session instructed the Director-General to revise the draft budget downwards to a level at or very close to that of the 2000 budget. The Secretariat complied with this request and presented its revisions to states parties on 14 April. These revisions reduced the increase from 17 to four per cent and reduced the requested new posts from 20 to 12. However, another round of informal consultations in late April demonstrated that consensus would not be achieved on anything other than the 2000 level. Therefore, the Council's ninth meeting on 2 May instructed the Director-General to reduce the draft budget again until it became a "zero growth" budget compared to 2000. Delegations also felt that not all 12 requested new posts were justified and instead deferred to the guidance of the Advisory Body on Administrative and Financial Matters (ABAF) which had considered only 3 to be justifiable. It was felt that, considering the political issues involved, the creation of an Information Systems Division headed by a new D-1 was not practicable for the 2001 budget.

In a statement to its ninth meeting, the Director-General expressed his regret at the Council's decision, stating that "zero growth" effectively meant a real reduction in budgetary resources available to the OPCW. He predicted that the decision could have severe operational consequences for the OPCW. The Director-General expressed his hope that in future delegations would provide guidance on the approximate level of the budget much earlier, rather than just a few weeks before the Conference. Later, in his opening statement to the CSP, he said that a meaningful increase in the budget would have to take place in 2002 to accommodate the anticipated surge in destruction activities. He also encouraged delegations to begin their deliberations on the 2002 budget no later than this autumn.

In accordance with the Council's request, the Secretariat circulated a third draft of the budget on 11 May. This draft amounted to EUR 60,238,400, the level of the 2000 budget, and included no new posts. It was considered by the Council's tenth meeting which was convened during the Conference on 16 and 18 May. The draft was adopted and forwarded to the Conference for its approval, four weeks after the deadline set down in the financial regulations for its submission had passed.

The Secretariat also submitted to the Council's nineteenth session the *Draft Medium-Term Plan 2001–2004*. The Council brought the plan to the attention of the CSP and agreed to consider it further at its twentieth session.

The Council noted the report of the eighth session of ABAF which met during 29–31 March. The ABAF reviewed the status of the 1999 and 2000 budgets and examined the *Draft Medium-Term Plan 2001–2004*. The ABAF also reviewed the interim staff rules and held a general discussion on performance-based budgeting. Mr Arnoud Cals

was elected as the ABAF's chairman with Mr Pawan Chopra as his vice-chairman. The Council noted the resignations of Mr B.N. Jha and Mr John Fleming from the ABAF and their replacement by Mr Pawan Chopra and Mr Richard Prosen respectively. The ABAF decided to hold its ninth meeting in January 2001.

SAB recommendations In accordance with the decision of the Conference at its fourth session, a group of governmental experts met on 9 February to consider recommendations made by the second session of the Scientific Advisory Board. The meeting considered three issues: the reporting of ricin production; the meaning of "production by synthesis"; and problems related to salts of scheduled chemicals. On the first issue the expert meeting agreed with the Board that castor oil plants should not be subject to the Convention's reporting procedures. On the second issue all delegations who spoke disagreed with the Board's conclusion that the emphasis should be on the product rather than the process but they did agree that the issue should be kept under review. Similarly, the experts disagreed with the Board that the salts of all scheduled chemicals should be subject to declaration and verification.

After considering the report of the meeting, the Director-General put forward a number of recommendations. He recommended that a draft decision on ricin production be submitted for approval to the Conference. He suggested that the meaning of "production by synthesis" be kept under review and that it be included in the agenda of the first review conference. As to the salts of scheduled chemicals the Director-General sided with the Board's conclusions but proposed more time for reflection and further discussion. The report of the meeting along with the Director-General's recommendations was submitted to the Council's nineteenth session. The Council noted the report and forwarded it to the fifth session of the Conference.

Other issues The Council's nineteenth session considered the list of new spectra for inclusion in the Central OPCW Analytical Database validated by the sixth meeting of the Validation Group. As no concerns had been communicated by states parties, the Council approved the list of new spectra. The Validation Group will hold its seventh session during 5–6 June.

At its tenth meeting, the Council returned to the relationship agreement with the United Nations. As mentioned in CBWCB 45, the fourth session of the Conference had adopted a draft agreement. The Conference had also requested its chairman to carry out consultations with the UN on the basis of the draft and to report back to the Council, whereupon the Council was requested to take action to conclude the agreement. Ambassador Gymarti duly submitted a report on his consultations with the UN Under Secretary-General for Legal Affairs to the Council's tenth meeting. The Council decided to consider the chairman's recommendations during the intersessional period with a view to adopting a decision at its twentieth session.

The nineteenth session considered the appointment of the new external auditor as the term of office of the current auditor, Mr V.K. Shunglu, the Auditor General of India, came to an end with the completion of the audit of the

OPCW's financial statements for 1999. Four states parties, Ethiopia, India, Pakistan and the UK had put forward candidates for the post, although Ethiopia announced that it would withdraw its candidate. However, the Council was unable to make a recommendation to the CSP.

As reported in the previous quarterly review, the results of the sixth official laboratory proficiency test had raised numerous concerns, particularly about the way in which laboratories could lose their designated status simply by failing one test. Speaking to the Council's eighteenth session, the Director-General had proposed that laboratories in such a position are temporarily suspended until they pass a test, rather than losing their designation altogether. During the nineteenth session, most of the states parties possessing designated laboratories spoke in favour of the Director-General's proposal. The Council therefore requested the Director-General to revise the criteria for the retention of designated status and circulate the document to states parties as soon as possible. In fact, a draft decision was submitted to the Conference for its consideration.

The Council's nineteenth session adopted the *Report of the Executive Council on the Performance of its Activities (30 April 1999–2 April 2000)* and forwarded the draft *Report of the Organisation on the Implementation of the Convention (1 January 1999–31 December 1999)* for adoption by the Conference.

The Council's nineteenth session also approved for recommendation to the Conference privileges and immunities agreements with Kenya, Latvia and the UK.

Fifth Session of the Conference of the States Parties

The fifth session of the Conference of the States Parties took place in The Hague during 15–19 May. It was attended by around 500 participants from 109 states parties, 7 signatory states, 2 contracting states, 1 non-signatory state, 3 international organizations and 16 non-governmental organizations and chemical industry associations.

Opening of the session The session was opened by the outgoing chairman of the fourth session of the Conference, Ambassador Istvan Gyarmati (Hungary). The Conference received a message from the UN Secretary-General urging states parties to help the OPCW uphold the Convention's provisions and encouraging all states which had not signed or ratified the CWC to do so without delay.

In his opening statement, the Director-General welcomed the new members of the OPCW and noted that the CWC is the fastest growing global disarmament agreement in history. Speaking on the situation in the Middle East, the Director-General emphasised Egypt's historical responsibilities in the region and expressed his hope that Israel would take the next logical step and ratify its signature of the Convention.

The Director-General addressed what he considers to be the main challenges which will face the OPCW in the coming years: the global elimination of chemical weapons; the need to ensure a balanced and credible industry verification regime; the implementation of Articles X and XI; and matters of governance within the OPCW. He also referred to

the forthcoming first review conference, at which the progress made since entry into force will be assessed.

General debate A total of 37 states spoke during the general debate with Portugal and South Africa delivering statements on behalf of the members and associate members of the European Union and the countries of the African group respectively.

Appointment of officials Ambassador Jaime Lagos (Chile) was elected by acclamation as chairman of the fifth session of the Conference. Representatives of the following states parties were elected as vice-chairmen: Ghana, Sudan (Africa); India, Indonesia (Asia); Croatia, Russia (Eastern Europe); Brazil, Cuba (Latin America and the Caribbean); France, and the USA (WEOG). Mr Krzysztof Patulej (Poland) was elected as chairman of the committee of the whole. All of these officials will hold their positions until the next regular session of the Conference.

Election of new Executive Council members The Conference elected the following 21 new members of the Executive Council:

- Africa — Botswana, Cameroon, Nigeria, Sudan, Tunisia;
- Asia — China, India, Japan, Saudi Arabia, South Korea;
- Eastern Europe — Bulgaria, Croatia;
- Latin America and the Caribbean — Argentina, Brazil, Mexico, Uruguay; and
- Western Europe and Others — France, Germany, Italy, UK, USA.

These appointments are for two years and will begin on 11 May 2001.

Status of implementation of the Convention The Director-General submitted a report on the status of submission of initial declarations and other notifications by states parties. He reported that, as of 11 May, all 132 states parties from which initial declarations were due had submitted them. Colombia's initial declaration is due on 4 June and those of Malaysia and Federal Republic of Yugoslavia on 19 June. This great improvement upon previous years was welcomed by the CSP which encouraged the Director-General to give consideration to using similar methods to improve compliance with other obligations. The increase in the submission of initial declarations was due primarily to bilateral visits to many of the states parties concerned by the Director of Verification, Jean-Louis Rolland and to political pressure brought to bear by some other states parties.

The Director-General reported that the rate of submission for the other notifications required by the Convention was indeed less encouraging. Of the 132 relevant states parties, 100 had informed the Secretariat of their national authorities, 75 had notified their points of entry, 62 had submitted standing diplomatic clearance numbers for non-scheduled aircraft and only 47 had submitted information on their national implementation measures to the Secretariat. In addition, the Director-General reported that, as of 31 December 1999, only 42 states parties had submitted information on their procedures for the handling of confidential information. The Conference requested the Council to keep monitoring compliance with these important obligations.

Upon the initiative of the Swiss delegation, the CSP decided to take additional action with regard to national implementation measures. A draft decision introduced by the Swiss noted that only 35 per cent of states parties had informed the OPCW of the legislative and administrative measures adopted to implement the CWC and that this figure had not increased significantly over the past two years. The decision accordingly encouraged those states parties able to do so to offer assistance in drafting national legislation to other states parties and requested the Council, the Director-General and the Secretariat to assist states parties in fulfilling their obligations under Article VII. The Council is to report to the sixth session of the Conference on progress achieved in this area. The Director-General also announced that five states parties (Finland, France, Germany, Norway and Spain) had already informed the Secretariat of the legislative measures taken to implement the ban on transfers of Schedule 2 chemicals to non-states parties.

Status of contributions and reimbursements The Director-General reported to the Conference on the status of contributions by states parties to the 2000 budget. Of the total 2000 assessments of NLG 105,470,972, the Secretariat had received NLG 84,000,019 (70.8 per cent) as of 30 April. Of the then 132 states parties, 46 had paid in full, 28 had partially paid but 58 had not paid anything. The Director-General also reported on the status of the contributions to the 1999, 1998 and 1997 budgets: 96.9 per cent; 99 per cent; and 99.5 per cent respectively.

The Director-General reported that, as of 11 May, the amount of arrears owed by 23 states parties (Armenia; Burkina Faso; Cook Islands; Costa Rica; Ecuador; El Salvador; Equatorial Guinea; Georgia; Ghana; Guinea; Guyana; Lao People's Democratic Republic; Maldives; Mali; Moldova; Mongolia; Niger; Paraguay; Seychelles; Tajikistan; Togo; Trinidad and Tobago; and Turkmenistan) equalled or exceeded the amount of contributions due from them for the preceding two full years. In accordance with Article VIII.8 these states parties lose their right to vote in the OPCW if they cannot satisfy the Conference that their failure to pay is due to conditions beyond their control. The Director-General's report included the minimum amount that each state party had to pay in order to retain their vote. The Conference noted the Director-General's report.

The Director-General also reported to the Conference on the reimbursement of verification costs by states parties which declared chemical weapons or chemical weapons related facilities under Articles IV and V. Of a total of NLG 19,729,895 invoiced to the nine states parties (China, France, India, Iran, Japan, Russia, UK, USA and one other), as of 30 April the Secretariat had only received NLG 9,971,625, a shortfall of NLG 9,761,997. Only China, France, Japan and the UK had paid all of the amounts invoiced to them. India, the USA and another state party had partially paid, while Iran and Russia had paid nothing.

2001 programme and budget In contrast to previous years, the Council was able to reach consensus on a draft budget to be forwarded to the CSP, albeit at very late stage. In the past, the CSP itself has had to consider the draft bud-

get, whereas this year the document as approved by the Council's tenth meeting on 16 May was simply adopted. From 2001, the OPCW's finances are calculated in Euros — 1 Euro equal to 2.2 Dutch Guilders.

As adopted the budget for 2001 amounts to EUR 60,238,400 and includes no new fixed-term posts. As required by the Convention, the budget is divided into two chapters, the first dealing with verification costs and the second dealing with administrative and other costs. For 2001, Chapter 1 costs amount to EUR 29,546,800, while Chapter 2 costs total EUR 30,691,600. Excluding EUR 5,340,000 miscellaneous income, the total amount due from states parties according to the scale of assessments adopted by the Conference is EUR 54,898,400. Miscellaneous income includes items such as interest on bank accounts and reimbursements from possessor states under Articles IV and V of the Convention. In previous years it has also included subsidies from the host country which cover the rent for the OPCW headquarters, its energy and maintenance costs and facilities for the annual Conference sessions. However, these subsidies end on 16 February 2001 and the amount of miscellaneous income consequently declines by about EUR 3,100,000.

The OPCW expects to carry out 220 inspections in 2001, including 132 chemical industry inspections. It also expects to conduct seven visits to CWDFs for initial and final engineering reviews. Now the US Article VI declaration has been submitted there is less reason for other states parties to impose restrictions on the number of industry inspections which they receive. However, it will still take time for all the declared Schedule 2 and 3 sites in the USA to receive their initial inspections, particularly as the USA informed the Director-General that it could only host 18 industry inspections in the remaining months of 2000.

Conference decisions The Conference began its work by adopting a number of procedural decisions on attendance by international organisations, non-governmental organisations and non-signatory states. The status of the two contracting states, Malaysia and the Federal Republic of Yugoslavia, was clarified on the basis of the informal understanding agreed upon by the first session of the Conference, which had been applied by the first, second and third sessions to other contracting states.

The CSP considered a total of six CWPF conversion requests which had been recommended by the seventeenth (for three facilities at Chapaevsk and Berezniki in Russia) and nineteenth (for facilities at Valley and Randle in the UK and at Volgograd in Russia) sessions of the Council. The Conference adopted all six requests in accordance with the Council's recommendations. The CSP has now approved conversion requests for eleven CWPFs, two of which (one in the USA and one in the UK) have already been certified as having been fully converted to peaceful purposes.

The Conference also had to consider the Council's recommendation to grant Russia an extension to the phase 1 deadline for the destruction of Category 1 chemical weapons. According to the Convention such requests have to be approved by the Conference itself. While some delegations had expressed concern at the missed deadline in their national statements, the Conference approved the Council's

recommendation and also adopted the related decision calling for more international assistance to Russia.

The Conference considered a draft decision on the criteria for OPCW-designated laboratories to retain their status in the light of the Council's consideration of the issue. The revised criteria would mean that rather than automatically losing their designated status, laboratories which failed a test would be suspended until they were able to pass a test. While the Conference was unable to adopt the decision, it did refer it back to the Council as a priority issue to be considered at its twentieth session. Acknowledging the urgency of the issue, the Conference additionally delegated to the Council the authority to take a decision.

The fourth session of the Conference approved revisions to the certification procedure for the Central OPCW Analytical Database and on-site databases adopted by its first session. At its sixth meeting, the Validation Group for the database recommended further revisions to the procedure in the light of the Secretariat's decision to obtain quality assurance accreditation for the OPCW laboratory and for the organisation of the Central OPCW Analytical Database. The Director-General accordingly submitted the revised certification procedure to the fifth session of the CSP for its approval. However, the Conference did not adopt the draft decision and instead referred it back to the Council to prepare a recommendation for the sixth session of the CSP.

The CSP also approved a number of other recommendations from the Council. As recommended by the Council's nineteenth session, the Conference adopted privileges and immunities agreements with three states parties: Kenya, Latvia and the UK. These bring the total of such agreements adopted to seven. As recommended by the Council's sixteenth session, the CSP authorised the Director-General to deposit with the UN Secretary-General the OPCW's instrument of accession to the 1986 Convention on the Law of Treaties between States and International Organisations or between International Organisations. The Conference also confirmed the Council's recommendation on the re-appointment of the Director-General and took a decision on the appointment of the external auditor. This latter decision was one of the more controversial of the CSP. Discussions within the Committee of the Whole could not arrive at a consensus between the candidates put forward by India, Pakistan and the UK. In the end, the Committee had to take a straw poll to decide firstly whether a composite bid by the Indian and Pakistani candidates would be acceptable and then to decide whether the composite bid or the UK bid would be approved. The Indian-Pakistani composite bid narrowly won the straw poll and the CSP decided that it would be up to the two countries to decide who begins the six-year term of office, from 2000 to 2005.

Decisions on unresolved issues The Conference confirmed the model facility agreement for CWDFs adopted by the Council's tenth meeting. This means that the Conference has now adopted model facility agreements for chemical weapons production, storage and destruction facilities, for Schedule 1 facilities and for Schedule 2 plant sites. The report of the expert meeting held in February on the recommendations of the second session of the SAB, was forwarded by the Council to the Conference. A draft decision

on the reporting of ricin production which would implement the recommendations of the meeting and the SAB was submitted to the CSP. According to the draft castor oil processing plants should not be subject to the Convention's reporting procedures under Schedule 1. This draft decision was also adopted by the Conference. The issues of ricin production and the model facility agreement for CWDFs were therefore removed from the list of unresolved issues. The Conference also confirmed the decisions taken by the nineteenth session and tenth meeting of the Council on the transfer and declarations aspects of the low concentration issue. This had been one of the major unresolved issues remaining from the Preparatory Commission and should improve the consistency of Schedule 2 and 3 declarations submitted by states parties, although some aspects are still under consideration by the Scientific Advisory Board.

Fostering of international cooperation For the first time at a session of the Conference, the Director-General made a specific statement on international cooperation, reflecting the significance which he attaches to the issue. In his statement, he stressed that international cooperation is one of the "foundation blocks" of the Convention and reflects the generally accepted relationship between disarmament and development while also serving as an incentive for countries to join the CWC. The Director-General reminded the CSP of the extensive programmes offered by the OPCW, particularly those dealing with implementation assistance. However, he emphasised that international cooperation should not be interpreted merely as support for national authorities. The OPCW has acquired considerable expertise in areas such as the handling and destruction of toxic materials, chemical analysis, chemical safety, risk assessment and chemical legislation and regulation. According to the Director-General, the OPCW has a responsibility to make its expertise available to all states parties. The OPCW has therefore, developed partnerships with other international organisations working on the sound management of chemicals. On the subject of technology control regimes, the Director-General stated that the increased trust among states parties engendered by the OPCW's verification activities will inevitably lead to changes in the restrictions and control measures applied to states parties.

Consideration of the draft resolution on the fostering of international cooperation submitted by Cuba, Iran and Pakistan to the third session of the Conference was referred back to the Council for prompt action.

Universality As requested by the fourth session of the Conference, the Director-General submitted a report on the implementation of its recommendation concerning the universality of the CWC. The report listed the nine states which had deposited instruments of ratification or accession between the fourth and fifth CSP sessions (Nicaragua; Liechtenstein; San Marino; Eritrea; Azerbaijan; Kazakhstan; Colombia; Yugoslavia; and Malaysia). This report also detailed the measures which the Secretariat had taken to encourage the universality of the CWC including a whole range of seminars and courses and high-level bilateral contacts in capitals, at regional meetings and during the 54th UN General Assembly in New York in October 1999.

As has become traditional, the delegation of South Korea introduced a recommendation on ensuring the universality of the CWC. The recommendation was similar to that adopted by the previous session of the Conference. It urged all states to ratify or accede to the CWC as soon as possible and called on the Director-General and states parties to encourage new members, particularly those believed to possess chemical weapons. The recommendation requested the Director-General to report to the sixth session of the Conference on its implementation.

Reports The Conference considered and approved the *Report of the Organisation on the Implementation of the Convention (1 January 1999–31 December 1999)*. The outgoing chairman of the Council introduced the *Report of the Executive Council on the Performance of its Activities (30 April 1999–2 April 2000)* which the Conference noted. The Conference also noted the annual report by the Office of Internal Oversight for 1999, the Director-General's report concerning the expert meeting in January on the recommendations of the Scientific Advisory Board, the report of the fourth session of the Confidentiality Commission and the Director-General's report on the implementation of the confidentiality regime within the Secretariat.

Action by Member States

Ratifications During the period under review four additional states deposited their instruments of ratification or accession with the UN Secretary-General. In chronological order they were: Kazakhstan ratified the Convention on 23 March (entry into force on 22 April); Colombia ratified on 5 April (entry into force on 5 May); the Federal Republic of Yugoslavia acceded on 20 April (entry into force on 20 May); and Malaysia ratified on 20 April (entry into force on 20 May). This brings the total number of states parties to 135 and the number of signatory states to 37.

Technical Secretariat

Declaration processing As reported in many previous quarterly reviews, since entry into force there had been a fairly constant minority of states parties which had not submitted their initial declarations. The number of states parties in technical non-compliance had remained around 30 despite political pressure from the Council and Conference and the establishment of the declaration network by the Secretariat. In response to this situation the Director-General tasked the Director of Verification, Mr Jean-Louis Rolland, to address this problem through contacts with the non-compliant states parties. Over the course of the past few months, Mr Rolland travelled to a number of the states parties involved to personally encourage the fulfilment of their obligations and had contacts with the others. He was also aided by bilateral influence brought to bear by a number of other states parties. This political initiative appears to have paid off as the Director-General reported to the fifth session of the Conference that all the outstanding initial declarations had been received by the Secretariat.

After many months of preparation the Electronic Document Management System (EDMS) finally underwent a

full audit. The audit, to assess the implementation of policies, practices and procedures for securing confidential information on the EDMS, lasted from 25–31 March. Despite problems in the past, this time the audit team's report was positive, reporting to the Director-General that the safeguards in place provide reasonable assurance to states parties that confidential information is being adequately protected. The Director-General submitted the team's report to the Council's nineteenth session and announced his intention to start loading all declaration data onto the EDMS and to use it for processing declarations.

Inspections As of 29 May, 739 inspections had been completed or were ongoing at 352 sites in 35 states parties, including inspections of chemical weapons and chemical weapons-related facilities in China, France, India, Iran, Japan, Russia, UK, USA and one other state party. The Secretariat also launched the first inspection of a DOC plant site at the end of May. The breakdown of these inspections was as follows: 14 to ACW sites; 169 to CWDFs; 171 to CWPFS; 109 to CWSFs; 27 to OCW sites; 66 to Schedule 1 facilities; 122 to Schedule 2 plant sites; 59 to Schedule 3 plant sites; 1 to a DOC plant site; and one other. OPCW inspectors had spent a total of 46,159 person-days on mission.

Implementation of Article X The Secretariat and states parties are together enhancing the degree of assistance and cooperation available to states parties under Article X. Switzerland is a particularly active contributor in this respect. Its NBC Laboratory at Spiez hosted the third chief instructor training programme (CITPRO III) during 2–7 April and the second emergency field laboratory course (SEF-LAB II) during 14–19 May. Other active contributors include Slovakia which hosted a civil defence training course during 27–31 March and Sweden which is planning a second chemical support training course in Revinge during 7–26 August.

Implementation of Article XI The Secretariat continued to offer support to national authorities, primarily in the form of seminars and courses. The period under review has seen the focus of these events concentrated on the regional level. Meetings have been held in three regions over past few months: in Lima for Latin America and the Caribbean during 28–30 March; in Dubrovnik for Eastern Europe and the Mediterranean during 10–12 April; and in Singapore for South-East Asia during 3–5 May. The aim of these meetings has been to encourage national authorities to cooperate at a regional level acknowledging the many synergies which exist among states parties in certain regions. Further meetings are planned for other regions later in the year.

Interaction on a global level was the aim of the second annual meeting of national authorities and chemical industry representatives which took place in The Hague from 12–14 May. This event followed on from the first meeting last year. In addition to segments for national authority personnel and chemical industry representatives, this year's meeting also included a day devoted to customs issues with contributions from the World Customs Organisation. The three day meeting was attended by 127 representatives from 69

national authorities. The Secretariat continues to run a series of training courses for national authority personnel, with an advanced course scheduled for 19-27 June in Ypenburg and a basic course in Odessa during 4-22 August.

The Secretariat also announced the strengthening of its capacity-building programmes. The former OPCW internship programme is to be replaced by the associate programme. Applicants for a pilot course are currently being sought. This pilot course for up to 12 participants will last from 18 September to 15 December. The aims of the associate programme are to enhance national capabilities by training personnel from national authorities and industry and to improve the suitability of chemists and chemical engineers from developing countries and those with economies in transition for employment in the Secretariat. The 13-week pilot course will consist of induction and review periods at the OPCW, industrial training at a UK university, visits to laboratories and customs facilities and industrial assignments at chemical plants in Europe.

Seventh official proficiency test The seventh official proficiency test was conducted during 1 March–4 April involving 16 laboratories. The preliminary evaluation of the results was considered by test participants in The Hague on 25-26 May and the final results will be circulated soon afterwards. The eighth test is due to start on 5 September.

Official visits King Albert II of Belgium visited the OPCW on 5 April. During the period under review, a number of parliamentary delegations have also visited. On 9 March a parliamentary delegation from Georgia led by the deputy minister of foreign affairs, Mr Merab Antadze, was briefed on the activities of the OPCW and a delegation from the Czech parliament visited on 2 May. A Finnish parliamentary delegation visited on 25 May and a delegation from the Mexican senate, led by its president, Senator María de los Angeles Moreno, was received on 26 May. Mr Matt Robson, the minister for arms control and disarmament of New Zealand visited on 27 March and discussed the promotion of universality in the South Pacific. On 22 May the OPCW hosted the 200 participants to the 2000 International Chemical Weapons Demilitarisation Conference. On 25 May the shadow foreign minister of Australia, Laurie Brereton, visited the OPCW and met with the Director-General. The Director-General undertook a trip to South America in April, visiting Argentina, Uruguay, Chile and Brazil. After the conference, the Director-General visited the Czech Republic meeting with senior officials in Prague. The Deputy Director-General travelled to Croatia in April to open the regional workshop in Dubrovnik and also met with governmental officials. Later, in May, he travelled to Singapore to open the regional forum and meet with government officials.

Outreach activities During the period under review, the Secretariat continued its activities aimed at increasing the membership of the OPCW. On 10 March the Secretariat organised a briefing in Brussels for those countries with missions there rather than in The Hague. The briefing was attended by 16 states parties, one contracting state and six signatory states. Efforts to reach out to states not based in

The Hague continued on 10 April when the Director of External Relations travelled to Geneva to meet representatives of Myanmar and North Korea. Another trip to Belgrade by the Director of Special Projects during 10-12 April showed quick results with the Federal Republic of Yugoslavia's accession on 20 April. An official of the Secretariat attended the sixth NPT review conference in New York in order to establish contacts with signatory and non-signatory states represented there. On 4 May the Deputy Director-General visited Bangkok to encourage ratification by Thailand. The Secretariat is planning a regional seminar to be held in the South Pacific. The seminar will be aimed at enhancing universality in the region where there are three signatory states and seven non-signatory states.

Staffing As of 19 May, 491 of the allotted 507 fixed-term posts in the Secretariat were occupied. Of these, 333 were in the professional and higher category and 158 were in the general service category. Including staff on short-term and temporary assistance contracts and others the total number of staff was around 550 from 64 different nationalities.

Subsidiary bodies

Scientific Advisory Board During the period under review, the Director-General circulated the report of the Scientific Advisory Board's third session which consisted of two meetings during 14–16 December 1999 and 15–16 March 2000. The Board considered reports by its temporary working groups (TWGs) on adamsite, analytical procedures and a joint report by the TWGs on equipment issues and destruction technologies. On the basis of these reports, the Board reached a number of conclusions.

Regarding adamsite, the Board concluded that it should no longer be used as a riot control agent (RCA), as it fails to meet current safety and environmental standards. If a state party does decide to retain adamsite as an RCA, its holdings should be consistent with such purposes, for example, the quantities involved should not exceed a few tonnes and should not be in a weaponised form.

With respect to analytical procedures during on-site inspections, the Board proposed alternative analytical techniques. When the identity of a scheduled chemical needs to be confirmed the inspection team can use simple methods such as infrared spectroscopy or use equipment supplied by the inspected state party as long as the independence of the results can be assured. In cases where sampling and analysis is required to demonstrate the absence of scheduled chemicals, the Board proposed that samples would be sealed and left on-site with the analysis being undertaken by an OPCW team sent after the completion of the inspection but before the inspection file is closed. The adoption of such a proposal would mean that the role of designated laboratories would relate mainly to cases which remain unresolved and to challenge inspections and investigations of alleged use. On the basis of the TWG's report, the Board also concluded that the incorporation into the Central OPCW Analytical Database of data on unscheduled degradation products and standard RCAs is essential and would not affect the composition of the Schedules themselves.

The TWG on destruction technologies decided to prepare a brochure on destruction technologies for diplomats and governmental experts. The Board welcomed a proposal to organise a seminar on the destruction of abandoned chemical weapons later in the year and stressed the importance of gaining industry participation in the event.

The Board also heard that its TWG on equipment issues would develop recommendations on the use of monitoring equipment at CWDFs and decided that a new TWG on bio-medical samples under the leadership of Victor Petrunin would be established once the Director-General has formulated specific questions for it to address. Finally, the Board discussed how it could contribute to the first review conference. It identified a number of areas which could deserve detailed study: chemical analysis; equipment and instruments; biosynthesis and other chemical manufacturing trends; biotechnology; remote sensing; nano-technology and bioassays. As a next step, these areas will be further clarified in cooperation with the OPCW and external scientific institutions and associations.

The Board confirmed the continuation of the chairmanship of Claude Eon and the vice-chairmanship of Will Carpenter for one more year. The Board's report and the Director-General's related recommendations will be considered by the Council's twentieth session.

Confidentiality Commission The Confidentiality Commission submitted to the Conference the report of its fourth session which met during 10–12 April. During its meeting, the Commission participated in a one-day dispute resolution workshop in which it considered a mock case involving a dispute of confidentiality between two states parties. The Commission also considered how best to fulfil the request of the Council's eighteenth session to undertake a number of tasks relating to confidentiality. In this respect, it reviewed the remedial action taken by the Secretariat. Acknowledging that the Council's request could not be adequately fulfilled during its fourth session, the Commission requested to hold a special session to further review the Secretariat's confidentiality policy and offer advice to the

Director-General. To prepare for this special session the Commission established a workshop group and drew up a work programme for the group and the Secretariat. The Commission also considered the arrangements for its registry which is being established in the Permanent Court of Arbitration. A full audit of the facilities could not be carried out at the scheduled time and the Commission decided that it should be carried out by 30 June at the latest. The Commission elected Mr Camilo Sanhueza Bezanilla as its new chairman and Dr Lauraine Lotter, Dr Ramamoorthy V. Swamy, Dr Jaroslav Fiedler and Prof. Dr Dieter Umbach as its vice-chairmen.

Future work

With the fifth session of the CSP and the third anniversary of the Convention now past, attention within the OPCW turns to the implementation of those additional measures which came into effect on 29 April, such as the transfer restrictions on Schedule 2 chemicals and the conduct of inspections to DOC plant sites. Another focus of attention will be the initiation of destruction activities in Russia and the monitoring of its obligation to destroy one per cent of its Category 1 chemical weapons. Much of the Secretariat's inspection effort will be concentrated on the initial inspections of Schedule 2 and 3 plant sites in the USA now that the US Article VI declarations have been submitted.

In the longer term, thoughts are already turning to the convening of the first review conference, which is likely to take place in May 2003. As noted above, a number of issues have already been slated for consideration by the review conference, including the application of low concentration guidelines to the transfer of Schedule 2 chemicals and the meaning of "production by synthesis". In addition, the Scientific Advisory Board has begun to consider its contribution to the review conference.

This review was written by Daniel Feakes, the HSP researcher in The Hague

Strengthening the Biological and Toxin Weapons Convention

A three week session, the nineteenth, of the Ad Hoc Group (AHG) to consider a legally binding instrument to strengthen the Biological and Toxin Weapons Convention (BWC) was held in Geneva from Monday 13 March to Friday 31 March 2000. As in the previous sessions, negotiations focussed on the rolling text of the Protocol.

In the March session, 53 states parties and 1 signatory state participated; a net total of 1 more state party than in January/February as 3 states (Ireland, Mongolia, Singapore) participated in March whilst 2 states (Albania and Iraq) which had participated in January/February did not in March. The same single signatory state (Morocco) participated in March as in January/February.

The Friend of the Chair for the Seat of the Organization changed to Ambassador Seiichiro Noboru of Japan who had replaced Ambassador Akira Hayashi. In addition, a Friend of the Chair on Compliance Measures was appointed for Declaration Formats, Dr Anthony Phillips of the UK.

The sharp reduction in the number of new Working Papers was continued with only three being submitted in March (WP.413 to 415) with two presented by single states and one by the European Union.

The outcome of the March session was produced as a complete update of the Protocol issued as Part I of the procedural report (BWC/AD HOC GROUP/51). This was thus the

twelfth version of the rolling text – previous versions having been produced in June 1997 (#35), July 1997(#36), October 1997 (#38), February 1998 (#39) and June/July 1998 (#41), September/October 1998 (#43), January 1999 (#44), April 1999 (#45), July 1999 (#46), October 1999 (#47) and February 2000 (#50). As with previous procedural reports, a Part II containing an Annex IV was again produced containing papers prepared by the Friends of the Chair of proposals for further consideration in which the Part I draft Protocol text is modified in a transparent way. Annex IV (Part II text) reflected the structure of the Protocol with Friend of the Chair proposed language for the Articles, Annexes and Appendices of the Protocol.

The March session spent most time on compliance measures (5¹/₂ meetings of which 1 was devoted to declaration formats), investigations (4²/₃ meetings), definitions and objective criteria (4¹/₃ meetings), Article X measures (2²/₃ meetings) and with between ¹/₃ and 1¹/₂ meetings on the other topics. Three meetings were devoted to informal consultations on declaration formats. In addition, a number of informal consultations were held to discuss issues prior to their consideration at formal meetings.

The March session saw various NGO and other activities. On 13 March, the Department of Peace Studies at the University of Bradford presented and distributed a further three Evaluation Papers in its series: No 15 *Preamble*, No 16 *Article IV: Confidentiality Provisions*, No 17 *The BTWC Protocol: Proposed Complete Text for an Integrated Regime* (all are available at <http://www.brad.ac.uk/acad/sbtwc>). EP 17 presented a complete clean text for the Protocol which sought to introduce realism and to strike a balance between the different aspirations so as to arrive at a worthwhile and valuable Protocol acceptable to all states parties. As the 25th anniversary of the entry into force of the BWC occurred on Sunday 26 March, seminars were held in New York on 24 March and in Geneva on 27 March to mark the occasion. The New York symposium on “Strengthening the Biological Weapons Convention: International Cooperation and Exchanges in the Field of Biotechnology” was organized jointly by the UN Department of Disarmament Affairs and the International Centre for Genetic Engineering and Biotechnology (ICGEB): this had opening statements by Jayantha Dhanapala, Under Secretary-General for Disarmament Affairs and Ambassador Taylhardat, President of the Board of Governors of the ICGEB. Keynote Speakers were Dr Joshua Lederberg and Dr Arturo Falaschi on Article X of the BWC — technical cooperation in biotechnology, Ambassador Tibor Tóth on the work of the Ad Hoc Group of States Parties to the BWC, Dr Jack Melling and Dr Nikolai Gnuchev on the role of the biotechnology industry in technical cooperation and exchange, and Dr Demissie Habte and Dr Ottorino Cosivi on biotechnology and medicine — cooperative efforts in preventing and fighting outbreaks of diseases. The Geneva seminar on “25 Years of the Biological and Toxin Weapons Convention: Assessing Risks and Opportunities” was organized jointly by the United Nations Institute for Disarmament Research (UNIDIR), the Federation of American Scientists (FAS), the International Security Information Service (ISIS), the Verification, Research, Training and Information Centre (VERTIC) and the University of Bradford

Department of Peace Studies. It was chaired by Ambassador Tóth and had as speakers Nicholas Sims on “The Convention in historical perspective: the first, and the next 25 years”, Dr Mark Wheelis on “Biological weapons in the 21st century: the Convention, the Protocol, and the changing science”, Minister Antonio de Aguiar Patriota, Mission of Brazil to the UN on “The importance of technical co-operation for the Biological and Toxin Weapons Convention” and Dr Patricia Lewis on “Putting the Biological and Toxin Weapons Convention in the wider disarmament context”.

Political Developments

A number of political statements were made during the March session as there were several statements to the AHG by Foreign Ministers or Ambassadors to mark the 25th anniversary of the entry into force of the BWC. On the opening day of the March session, Portugal on behalf of the European Union made a statement saying:

The EU believes that the most appropriate manner in which to mark this anniversary year would be the early and successful completion of the negotiations on a Protocol to strengthen the implementation of the Convention. ... To achieve our goal, we must continue to improve on our working methods. ... We also now need to refine the crucial elements for an effective Protocol that are already well developed within the text before us.

After emphasizing the necessity for a comprehensive declaration regime in which:

The EU maintains that it is essential that biodefensive activities and facilities, vaccine production, maximum biological containment, work with listed agents and/or toxins and other production be declared annually

the statement went on to say:

The Protocol must contain an effective mechanism for follow-up of declarations in the form of visits. The concept of visits based on random selection that is now widely accepted is an important step forward. The EU emphasizes its belief that a visit regime must include such visits, selected on the basis of appropriate mechanisms of random selection, to enhance transparency of all declared facilities and activities, to promote accuracy of declarations and to ensure fulfilment of declaration obligations.

It also stressed that the Protocol must include appropriate clarification procedures, provisions for rapid and effective investigations, and specific measures to further international cooperation and exchanges in the field of biotechnology. The statement goes on to say:

the Protocol must also provide for effective measures regarding transfers/export controls. Those measures, through improved transparency and confidence-building among states parties, must ensure that inadvertent transfer of materials intended for purposes prohibited by the Convention will not occur.

It concludes by noting:

The EU member states are ready to support initiatives that will facilitate the negotiation process in order to conclude our work in a quick and effective manner. In this context, we encourage the Chairman to present his vision of a comprehensive text for the future Protocol.

Later the same week, on 16 March, President Clinton in videotaped remarks to the Carnegie Non Proliferation Conference in Washington, DC, said:

It would be foolish to rely on treaties alone to protect our security. But it would also be foolish to throw away the tools that sound treaties do offer: a more predictable security environment, monitoring inspections, the ability to shine a light on threatening behaviour and mobilize the entire world against it. So this year, we will work to strengthen the Biological Weapons Convention.”

The following two weeks saw a number of further political statements:

- 20 March: Mexico — Under-Secretary of Foreign Affairs, Ambassador Carmen Moreno;
- 23 March: UK — Minister of State, Foreign & Commonwealth Office, Peter Hain;
- 26 March: United Nations Secretary-General, Kofi Annan;
- 27 March: Joint Statement by the Depositary States (Russia, UK and USA);
Australia — on behalf of Australian Minister for Foreign Affairs, Alexander Downer;
Brazil — Ambassador Celso Amorim;
Finland — Minister for Foreign Affairs, Erkki Tuomioja;
Hungary — Minister for Foreign Affairs, Janos Martonyi;
India — Ambassador Savitri Kunadi;
Russian Federation — Ambassador Vassily Sidorov;
- 29 March: The Netherlands — Minister of Foreign Affairs, Jozias van Aartsen;
USA — President’s Senior Advisor for Arms Control, John Holum;
- 30 March: Cuba — Minister of Foreign Affairs, Felipe Perez Roque; and
- 31 March: USA — Ambassador Don Mahley, Right of Reply to 30 March statement.

Rather than considering each of these statements in chronological order it is more interesting to consider some of the points made about the importance of the Protocol, the maturity of the text, the importance of both development and security, the topic of transfer regimes and export controls and the completion of the Protocol.

The importance of the Protocol was stressed:

- “... it is high time to fill this ever more evident gap in arms control provisions and, in so doing, give the Biological Weapons Convention the necessary teeth by the establishment of an effective compliance regime which will help deter and detect proliferators” — UK
- “The admission in the 1990s of former offensive biological weapons programs, and terrorist attempts that have fortunately failed, have created legitimate concerns within the world community. Those events have exposed even further biological weapons as second-to-none weapons of mass destruction, and, at the same time, the biological weapons prohibition regime as the weakest link in the system of weapons of mass destruction prohibition regimes” — Hungary.

Insofar as the maturity of the Protocol text was concerned a number of states made observations:

- “We also need to refine the crucial elements for an effective Protocol that are already well developed in the text before us” — EU;
- “The draft BWC Protocol already contains all the essential measures and much of the necessary language” — UK;
- “We are not there yet, but we are surely getting closer. We now must make the final strides to make it to the finish” — Netherlands;
- “From January 1999, ... you [the AHG] have managed to cut the forest of brackets in half, bringing it [the Protocol] extremely close to a draft ready for final consolidation” — Hungary; and
- “It seems that the text is well advanced. We have reached the stage where there is not much more to do, except turn our minds to resolving the fundamental differences which stand between us and a completed Protocol” — Australia.

A number of states made remarks about the elements of the Protocol regime — several emphasized the importance of visits:

- “the concept of on-site visits is central to the effectiveness of the BWC Protocol” and that “even a small number of visits will simultaneously help to confirm the consistency of declarations, maximize the transparency value derived from this information and deter non-compliance” — UK
- “Mexico, together with the Non-Aligned Countries, has introduced a proposal on the different types of visits that the Protocol must foresee. This proposal includes randomly selected, voluntary clarification and assistance visits” — Mexico;
- “We have submitted working papers ... on the concepts of voluntary assistance and randomly selected visits. In addition to enhancing transparency and promoting accurate and complete national declarations, such visits should serve the purpose of fostering cooperation and extending assistance.” — Brazil; and

Russia emphasised the importance of definitions:

- “we are in favour of a uniform understanding of the Protocol ensuring a uniform interpretation and evaluation of its provisions and its implementation. The Russian Federation submitted proposals on definitions of basic terms such as biological weapons, biological agents, hostile purposes and others. We assume that these definitions will not be aimed at revising the scope of the Convention and will be used exclusively for the purposes of verification under the Protocol”.

A number of states made statements about the importance of considering both development and security:

- “All States have a stake in the promotion of better practices, standards and capabilities in the biological field....The development and security challenges we face cannot be dissociated....There is thus a clear synergy to be explored between the improvement of national capabilities and our common pursuit of the optimal performance of the Protocol’s verification mechanisms” — Brazil;
- “We must further the enjoyment by all states, great or small, east or west, north or south, of the benefits that can be brought to them through peaceful uses of biotechnology. We must ensure that States get access to the

technologies they need for their economic prosperity” — Netherlands; and

- “It is of the utmost importance for the future Protocol to develop and improve the two pillars on which the Protocol is based: security and development” — Cuba.

The key issue of transfers and export controls attracted attention in a number of statements (including that of the EU already noted above):

- “Among the most difficult matters still before us and one which will require a greater degree of flexibility, we wish to highlight the relationship between multilateral treaties and political export-control arrangements” — Brazil;
- “The United States is prepared to remove its overall brackets from around this section of the rolling text [Measures to strengthen the implementation of Article III of the Convention] ... as a means to get the real negotiating process underway” — USA; and
- “Regulation of technology transfers for peaceful uses must be included in the Protocol and constitute the general legal framework for any transfer among States Parties” — Mexico.

There was also considerable emphasis on the completion of the Protocol:

- “Successful achievement of an effective Protocol within the agreed timeframe must be the objective of all States Parties” — co-Depositaries;
- “Every effort must be made by the international community to ensure that advancements in biotechnology are applied towards the improvement of life in our planet and never for purposes that run counter to the provisions of the Biological Weapons Convention. I would, therefore, encourage the States parties to conclude negotiations on a protocol to the Convention at the earliest possible date” — UN Secretary-General;
- “There is a need to act upon the 1996 consensus expectation, which mandates you to conclude the negotiations at any time before the 2001 Review Conference” — Hungary;
- “... the shared objective of concluding a viable Protocol of universal acceptability can be achieved before the next Review Conference in 2001” — India;
- “Let us comply with our mandate and conclude the verification Protocol before the Fifth Review Conference of the Convention on the Prohibition of Biological Weapons” — Mexico; and
- “...never have the reasons for concluding the protocol been so acute. Ultimately, the choice is about what kind of world we want to live in. The wrong choice, or even the right choice made too late, too grudgingly, could be devastating” — Australia

There was thus widespread recognition of the maturity of the text, of the importance of addressing both development and security, and a readiness to engage in consideration of the contentious issue of transfers and export controls so as to move ahead to complete the Protocol. Overall, there was a sense that the Ad Hoc Group should indeed complete the Protocol before the Fifth Review Conference with Brazil usefully reminding the AHG:

Pessimism is often expressed under the guise of realism. But pessimism, however intelligent and reasonable it might sometimes sound is always a self-fulfilling prophecy.

The Emerging Regime

All sections of the Protocol were addressed during the March session with most time being spent on compliance measures with particular attention being paid to declaration formats in both formal and informal meetings, investigations, definitions and objective criteria and Article X measures.

Compliance Measures The March session saw further development of both Article III *Compliance Measures* and progress in the declaration formats. In Section D *Declarations I Submission of Declarations Initial Declarations* there was a division of the previous (A) *Past Offensive and/or Defensive Biological and Toxin Programmes and/or Activities* into a new (A) *Offensive Biological and Toxin Programmes and/or Activities Conducted Prior to Entry into Force of the Protocol for Each State Party* and (B) *Defensive Biological and Toxin Programmes and/or Activities Conducted Prior to Entry into Force of the Protocol for Each State Party* although the square brackets under these headings are essentially unchanged. The heading for the first of the Annual Declarations changed from (B) *Current Defensive Biological and Toxin Programmes [and/or Activities]* to (C) *Defensive Biological and Toxin Programmes and/or Activities Conducted During the Previous Year* and in so doing emerged from square brackets although yet another form of alternative language appeared under this heading. There was some further alternative language proposed under the other headings for declarations in this section. The US proposal made in the statement by John Holum on 29 March, two days before the end of the session, to eliminate four declaration elements — outbreaks of disease, national legislation and regulations, other facilities and BL-3 laboratory facilities, the first two of which were favoured by the US and the latter two of which were objected to by the US — from further consideration came too late to make any change in the draft Protocol. Overall, there was a useful further reduction of over 15 per cent in the number of square brackets in the section on declarations.

There was some further elaboration of alternatives for the text in III. *Measures to Ensure Submission of Declarations* and further development of the text for E. *Consultation, Clarification and Cooperation*. Additional language was proposed for the section F. *[Measures to Strengthen the Implementation of Article III]* from which the original outer square brackets had been removed following the US statement. This language within square brackets includes proposals for states parties to notify the Technical Secretariat annually of any imports or exports of fermenters or bioreactors with a total internal volume of 100 litres or more and of aerosol challenge testing chambers with a capacity of one cubic metre or more. Other new language proposes the requirement for each state party to establish the legislation, regulatory and/or administrative provisions for controls to regulate the transfer of agents, toxins, equipment and technologies relevant to the BWC in accordance with its obligations under the Convention.

Investigations The language in Article III section G *Investigations* and Annex D *Investigations* continues to

develop with further square brackets being removed. A significant step forward occurred in respect of field investigations where language emerged from square brackets so that field investigations can be requested in order to address a concern about possible non-compliance under Article I of the Convention or alleged use of biological weapons. Useful attention was directed to the procedure to be followed following submission of a request for an investigation with progress being made on the procedures to be used to assess the basis for the request and the Executive Council consideration of the request. New language, out of square brackets, states that *The Executive Council, if it deems it appropriate for its [consideration][authorization] of the above request shall also request from the most relevant international organization(s) such as, but not limited to, the WHO, OIE, FAO, all available information in its/their possession, that may be relevant to the outbreak.* Further elaboration has emerged from square brackets in regard to the transition from a field investigation to a facility investigation with language that makes it clear that following a field investigation indicating that a facility is directly relevant to the alleged non-compliance concern, then a factual statement shall be submitted to the Executive Council who shall then provide it to the receiving State Party, the requesting State Party, and, if appropriate, the State Party on whose territory... the facility in question is located. Only these States Parties may submit a request for a facility investigation. Agreement has been reached on most of the time lines making it clear that a rapid investigation process is necessary although the mechanism for deciding on whether an investigation should take place (the 'red light'/'green light' debate) has yet to be resolved.

Definitions Further progress was made in developing definitions related to specific measures in the Protocol. There was also some development in the structure and categorization of the lists of agents within *Annex A Declarations I Lists and Criteria (Agents and Toxins)* with the previous list of "Human Pathogens" becoming "Human and Zoonotic Pathogens" and within that list "Bacteria" now including the previous separately listed "Rickettsiae". The list of "Animal Pathogens" which previously had no sub categories now has five sub categories: Bovine, Ovine, Swine, Avian and Equine Pathogens and the list of Plant Pathogens which also previously had no sub categories now has four sub categories: Cereal, Sugar cane, Cash crop and Forest Pathogens. There was no change to the square brackets in regard to the individual pathogens apart from the emergence of one cash crop pathogen, *Colletotrichum coffeanum* var. *virulans*, from square brackets.

BWC Article X Measures Article VII continued to make some progress with the deletion in Section (B) Measures to Promote Scientific and Technological Exchange of a paragraph previously in square brackets on biodefence which is more appropriate to Article VI Assistance and Protection. Progress was also made on partially bringing the title of Section E out of square brackets; this developed from (E) *[Implementation Follow-Up][Review of Implementation of Article X of the Convention and this Article]* to (E) *[Review of][Consideration of Concerns related*

to] the Implementation of Article X of the Convention and this Article. A number of conceptual discussions were also held on the few remaining difficult areas of this Article.

Other Issues

Preamble The text was streamlined and shortened with a number of clauses emerging from square brackets. The Preamble is now more focused on setting the Protocol within the wider scene.

Article I General Provisions There has been a useful addition of shorter alternative language which makes it clear that the Protocol is aimed at strengthening the effectiveness and improving the implementation of the BWC which is preferable to the previous language which extends the Convention and is thus beyond the mandate of the AHG.

Confidentiality Provisions Article IV and the associated Annex E are both largely out of square brackets and further progress was made in streamlining some of the text.

Organization Attention was focussed on section (E) addressing *Privileges and Immunities* with particular attention to immunity of the Organization and its staff. Alternative language within square brackets proposes that *The Organization shall not be held liable for any breach of confidentiality committed by members of the Technical Secretariat unless otherwise decided in accordance with the provisions of this Protocol.* Further language elaborates how any such waiver shall be decided. The number of square brackets remaining in *Article IX The Organization* was significantly reduced by over 50 per cent from 54 to 24.

National Implementation Measures Further reduction in square brackets from eight to five was achieved.

Prospects

The March session also saw the agreement of the programme of work for the four week twentieth session to be held on 10 July to 4 August 2000. The 40 meetings were allocated as follows:

Compliance measures	6
Declaration formats	4
Investigations	5.5
Article X	5
Definitions	6
Ad Hoc Group	9.5
General Provisions	0.5
Preamble	1
Legal Issues	1
National Implementation	0.5
Confidentiality	0.5
Seat of Organization	0.5
Total	40

Another useful development in the March session was the categorization for all delegations by the Friends of the Chair of the remaining square brackets within the draft protocol into one of the three categories: "Little controversy,

relatively easy to resolve”, “*Medium level of disagreement*”, or “*Strong conceptual differences in views*”. During the 14 weeks between the March and the July/August session, delegations can be expected to review with their respective governments their national positions on these remaining issues so as to develop approaches to reaching compromises on the outstanding issues. There were also useful indications in the political statements made to the Ad Hoc Group in March of a flexibility and willingness to explore new methods of work as there is a sense that the Friends of the Chair have to an increasing extent taken issues as far as they can.

The March session saw further progress in the reduction of the total number of square brackets in the Protocol and a useful reinforcement of the political will to complete the

Protocol expressed in the political statements made both in Geneva and elsewhere to mark the 25th anniversary of the entry into force of the BWC. There are indications of engagement on the most contentious remaining issue — measures to improve the implementation of Article III of the Convention which places obligations on states parties not to transfer materials and equipment to anyone whatsoever for prohibited purposes. There continues to be real engagement between the delegations who are addressing how to find solutions to the differences of views, which augurs well for the future. There is real impetus to complete the Protocol before the Fifth Review Conference.

This review was written by Graham S Pearson, HSP Advisory Board

Proceedings in South Africa

Quarterly Review no 1

The Continuing Trial of Wouter Basson

This report covers the period January–April 2000. A more detailed account is posted on the HSP website [www.sussex.ac.uk/spru/hsp/]. The opening of the trial and its initial proceedings are reported in the News Chronology of previous Bulletins, most recently at 24–28 January in the last issue.

The court heard the evidence of only seven witnesses during the January–April sitting, all of whom testified on matters relating to the fraud charges against the accused. Proceedings in the trial were interrupted from February 7 to 14 when the state launched an application for Justice Hartzenberg to recuse himself from the trial on the grounds of bias and prejudgment of the case before all the facts have been presented to the court.

The first witness to be called was forensic auditor, Hennie Bruwer. Bruwer answered questions about the 800-page report of his seven-year and ongoing investigation into the flow of funds Basson allegedly misappropriated from the Project Coast budget for personal gain. Bruwer found that the money was laundered through an international network of companies of which Basson was at all times the beneficial owner and in which some of his colleagues in Project Coast, friends and family members had financial interests.

The court heard that documents relating to the financial dealings of the companies in question were retrieved from American lawyer David Webster’s office after a ruling by an American court that he would have to make the documents available to South African investigators, despite client-attorney privilege. Based on these and other documents from various foreign banks, Bruwer established that both the WPW Group and the Wisdom Group, and all subsidiaries controlled by them, were set up to serve Basson’s own interests.

This was significant because central to the state’s argument for the recusal of the presiding judge, Willie Hartzenberg, were statements made by the judge which indicated that he was of the opinion that the WPW Group of companies served the interests of the chemical and biological warfare project.

The state claimed that the Judge’s remarks were premature and in direct contradiction to all the evidence presented, since the entire state case is based on the premise that Basson set up WPW in order to enrich himself.

The judge indicated that his understanding of the matters relating to the companies apparently established by Basson

rested on the understanding that the SADF had to act in a clandestine manner and that Basson was given the freedom by the Co-ordinating Management Committee (CMC) of the project to create covers for people associated with the programme and to procure equipment and substances without explanation. The judge indicated that the testimony of Gen Knobel that the CMC did not want to know the details of Basson’s activities was what justified his perception that it would take little to convince him that Basson had acted in the interests of the project.

Justice Hartzenberg declined to recuse himself from the case. In giving judgement he said that as he understood the fraud section of the case so far, it was agreed that Basson was ordered to develop both an offensive and defensive chemical and biological warfare capacity for South Africa. The project was top secret and managed by the South African Defence Force’s Co-ordinating Management Committee, on which served a handful of the most senior military officers. The need-to-know basis was rigorously enforced and Knobel had testified that, if it took theft, bribery or any other normally unacceptable means to acquire what was needed for the project, Basson was to get the goods. The CMC did not want to know where or how he did so, nor the names of people or countries involved, when, how and to whom payments were made. To this end, Basson had been issued with three false passports by the SADF to support his cover as a wealthy international businessman with chemical interests.

Knobel testified that the SADF would have had no problem if Basson had been required to pay collaborators or spend money to help them create plausible cover stories in their own countries in exchange for their assistance. For example, share capital could be bought, backed up with flamboyant correspondence, to support such a story. Knobel also testified that Basson carried out other tasks for the SADF, not connected to Project Coast, of which he knew no detail. Countries mentioned in this regard have been the US, UK, Belgium, Luxembourg, Cayman Islands, Poland, Libya and Croatia.

On 28 February during the cross examination of Hennie Bruwer, defence advocate Jaap Cilliers disclosed that the total budget for Project Coast for the financial years April 1987 to March 1993 was R270-m, including establishment and privatisation costs of Delta G Scientific and Roodeplaat Research Laboratories (R60-m to set up, R70m to privatise).

Operating costs of the two facilities averaged R21-m a year — R9-m for Delta G Scientific and R12-m for RRL — or about R105-m for the six years in question. Bruwer told the court that from March 1990 to February 1991, the project had R48-m available, of which R6-m was allegedly defrauded (Charge 16). From March 1991 to February 1992, the budget was R60-m.

During the cross examination of both Hennie Bruwer and Tjaart Viljoen (Project Coast accountant), Cilliers stated that American attorney David Webster and Basson had operated at all times on behalf of the real principles and beneficiaries of the companies. These principles were not named by Cilliers but it emerged on the final day of proceedings that Justice Hartzenberg understood these principles to have been the SADF. Details emerged during the testimony of Viljoen and banker Samuel Bosch of a luxurious lifestyle led by Basson,

Philip Mijburgh, Wynand Swanepoel and other people linked to Project Coast and much of the court's time was spent hearing of the numerous overseas trips undertaken. Jaap Cilliers told the court in Basson's defence that on many of these trips Basson had been conducting Project Coast business under the guise of being an international businessman.

When the trial resumes on Tuesday 2 May, prosecutor Anton Ackerman will lead argument as to why the testimony of David Webster and other foreign nationals needs to be heard and why their testimony should be heard in their countries of origin. The application will be opposed by the defence.

It is expected that the evidence in relation to the charges of human rights violations will follow, with 30 witnesses, including agents who allegedly carried out the murders and scientists who made the lethal toxins used, scheduled to take the stand in the next few months.

This report was written by Chandré Gould and Marlene Burger, of The Chemical and Biological Warfare Research Project at the Centre for Conflict Resolution, an independent institute associated with the University of Cape Town.

Signatories and Parties to the Biological Weapons Convention (BWC), the Chemical Weapons Convention (CWC), and the Geneva Protocol (GP)

	BWC	CWC	GP
Afghanistan	Si-10 Apr 72 R-26 Mar 75	Si-14 Jan 93 R-	Ac-9 Dec 86
Albania	Ac-3 Jun 92	Si-14 Jan 93 R-11 May 94	Ac-20 Dec 89
Algeria	—	Si-13 Jan 93 R-14 Aug 95	Ac-2 Mar 92
Andorra	—	—	—
Angola	—	—	Ac-8 Nov 90
Antigua and Barbuda	—	—	Su-27 Apr 88
Argentina	Si-1 Aug 72 R-23 Nov 79	Si-13 Jan 93 R-2 Oct 95	Ac-12 May 69
Armenia	Ac-7 Jun 94	Si-19 Mar 93 R-27 Jan 95	—
Australia	Si-10 Apr 72 R-5 Oct 77	Si-13 Jan 93 R-6 May 94	Ac-24 May 30
Austria	Si-10 Apr 72 R-10 Aug 73	Si-13 Jan 93 R-17 Aug 95	Si-17 Jun 25 R-9 May 28
Azerbaijan	—	Si-13 Jan 93 R-29 Feb 00	—
Bahamas	Ac-26 Nov 86	Si-2 Mar 94 R-	—
Bahrain	Ac-28 Oct 88	Si-24 Feb 93 R-28 Apr 97	Ac-9 Dec 88
Bangladesh	Ac-11 Mar 85	Si-14 Jan 93 R-25 Apr 97	Ac-20 May 89
Barbados	Si-16 Feb 73 R-16 Feb 73	—	Ac-16 Jul 76
Belarus	Si-10 Apr 72 R-26 Mar 75	Si-14 Jan 93 R-11 Jul 96	—
Belgium	Si-10 Apr 72 R-15 Mar 79	Si-13 Jan 93 R-27 Jan 97	Si-17 Jun 25 R-4 Dec 28
Belize	Su-20 Oct 86	—	—
Benin	Si-10 Apr 72 R-25 Apr 75	Si-14 Jan 93 R-14 May 98	Ac-9 Dec 86
Bhutan	Ac-8 Jun 78	Si-23 Apr 97 R-	Ac-19 Feb 79
Bolivia	Si-10 Apr 72 R-30 Oct 75	Si-14 Jan 93 R-14 Aug 98	Ac-13 Aug 85
Bosnia and Herzegovina	Su-15 Aug 94	Si-16 Jan 97 R-25 Feb 97	—

	BWC	CWC	GP
Botswana	Si-10 Apr 72 R-5 Feb 92	Ac-31 Aug 98	—
Brazil	Si-10 Apr 72 R-27 Feb 73	Si-13 Jan 93 R-13 Mar 96	Si-17 Jun 25 R-28 Aug 70
Brunei Darussalam	Ac-31 Jan 91	Si-13 Jan 93 R-28 Jul 97	—
Bulgaria	Si-10 Apr 72 R-2 Aug 72	Si-13 Jan 93 R-10 Aug 94	Si-17 Jun 25 R-7 Mar 34
Burkina Faso	Ac-17 Apr 91	Si-14 Jan 93 R-8 Jul 97	Ac-3 Mar 71
Burundi	Si-10 Apr 72 R-	Si-15 Jan 93 R-4 Sep 98	—
Cambodia	Si-10 Apr 72 R-9 Mar 83	Si-15 Jan 93 R-	Ac-15 Mar 83
Cameroon	—	Si-14 Jan 93 R-16 Sep 96	Ac-20 Jul 89
Canada	Si-10 Apr 72 R-18 Sep 72	Si-13 Jan 93 R-26 Sep 95	Si-17 Jun 25 R-6 May 30
Cape Verde	Ac-20 Oct 77	Si-15 Jan 93 R-	Ac-15 Oct 91
Central African Republic	Si-10 Apr 72 R-	Si-14 Jan 93 R-	Ac-31 Jul 70
Chad	—	Si-11 Oct 94 R-	—
Chile	Si-10 Apr 72 R-22 Apr 80	Si-14 Jan 93 R-11 Jul 96	Si-17 Jun 25 R-2 Jul 35
China [see note 1]	Ac-15 Nov 84	Si-13 Jan 93 R-25 Apr 97	Ac-24 Aug 29
Colombia	Si-10 Apr 72 R-19 Dec 83	Si-13 Jan 93 R-5 Apr 00	—
Comoros	—	Si-13 Jan 93 R-	—
Congo	Ac-23 Oct 78	Si-15 Jan 93 R-	—
Cook Islands†	—	Si-14 Jan 93 R-15 Jul 94	—
Costa Rica	Si-10 Apr 72 R-17 Dec 73	Si-14 Jan 93 R-31 May 96	—
Côte d'Ivoire	Si-23 May 72 R-	Si-13 Jan 93 R-18 Dec 95	Ac-27 Jul 70
Croatia	Su-28 Apr 93 [wef 8 Oct 91]	Si-13 Jan 93 R-25 May 95	—
Cuba	Si-12 Apr 72 R-21 Apr 76	Si-13 Jan 93 R-29 Apr 97	Ac-24 Jun 66

	BWC	CWC	GP
Cyprus	Si-10 Apr 72 R-6 Nov 73	Si-13 Jan 93 R-28 Aug 98	Su-12 Dec 66
Czech Republic	Su-5 Apr 93 [wef 1 Jan 93]	Si-14 Jan 93 R-6 Mar 96	Su-17 Sep 93 [wef 1 Jan 93]
Democratic People's Republic of Korea	Ac-13 Mar 87	—	Ac-4 Jan 89
Democratic Republic of the Congo	Si-10 Apr 72 R-16 Sep 75	Si-14 Jan 93 R-	—
Denmark	Si-10 Apr 72 R-1 Mar 73	Si-14 Jan 93 R-13 Jul 95	Si-17 Jun 25 R-5 May 30
Djibouti	—	Si-28 Sep 93 R-	—
Dominica	Ac-8 Nov 78 [see note 2]	Si-2 Aug 93 R-	—
Dominican Republic	Si-10 Apr 72 R-23 Feb 73	Si-13 Jan 93 R-	Ac-8 Dec 70
Ecuador	Si-14 Jun 72 R-12 Mar 75	Si-14 Jan 93 R-6 Sep 95	Ac-16 Sep 70
Egypt	Si-10 Apr 72 R-	—	Si-17 Jun 25 R-6 Dec 28
El Salvador	Si-10 Apr 72 R-31 Dec 91	Si-14 Jan 93 R-30 Oct 95	Si-17 Jun 25 R-
Equatorial Guinea	Ac-16 Jan 89	Si-14 Jan 93 R-25 Apr 97	Ac-20 May 89
Eritrea	—	Ac-14 Feb 00	—
Estonia	Ac-5 May 93	Si-14 Jan 93 R-26 May 99	Si-17 Jun 25 R-28 Aug 31
Ethiopia	Si-10 Apr 72 R-26 May 75	Si-14 Jan 93 R-13 May 96	Si-17 Jun 25 R-7 Oct 35
Fiji	Si-22 Feb 73 R-4 Sep 73	Si-20 Jan 93 R-20 Jan 93	Su-21 Mar 73
Finland	Si-10 Apr 72 R-4 Feb 74	Si-14 Jan 93 R-7 Feb 95	Si-17 Jun 25 R-26 Jun 29
France	Ac-27 Sep 84	Si-13 Jan 93 R-2 Mar 95	Si-17 Jun 25 R-10 May 26
Gabon	Si-10 Apr 72 R-	Si-13 Jan 93 R-	—
Gambia	Si-2 Jun 72 R-21 Nov 91	Si-13 Jan 93 R-19 May 98	Su-5 Nov 66
Georgia	Ac-22 May 96	Si-14 Jan 93 R-27 Nov 95	—
Germany	Si-10 Apr 72 R-7 Apr 83	Si-13 Jan 93 R-12 Aug 94	Si-17 Jun 25 R-25 Apr 29
Ghana	Si-10 Apr 72 R-6 Jun 75	Si-14 Jan 93 R-9 Jul 97	Ac-3 May 67
Greece	Si-10 Apr 72 R-10 Dec 75	Si-13 Jan 93 R-22 Dec 94	Si-17 Jun 25 R-30 May 31
Grenada	Ac-22 Oct 86	Si-9 Apr 97 R-	Ac-3 Jan 89
Guatemala	Si-9 May 72 R-19 Sep 73	Si-14 Jan 93 R-	Ac-3 May 83
Guinea	Ac-29 Jul 92	Si-14 Jan 93 R-9 Jun 97	—
Guinea-Bissau	Ac-20 Aug 76	Si-14 Jan 93 R-	Ac-20 May 89
Guyana	Si-3 Jan 73 R-	Si-6 Oct 93 R-12 Sep 97	—
Haiti	Si-10 Apr 72 R-	Si-14 Jan 93 R-	—
Holy See†	—	Si-14 Jan 93 R-12 May 99	Ac-18 Oct 66
Honduras	Si-10 Apr 72 R-14 Mar 79	Si-13 Jan 93 R-	—
Hungary	Si-10 Apr 72 R-27 Dec 72	Si-13 Jan 93 R-31 Oct 96	Ac-11 Oct 52
Iceland	Si-10 Apr 72 R-15 Feb 73	Si-13 Jan 93 R-28 Apr 97	Ac-2 Nov 67
India	Si-15 Jan 73 R-15 Jul 74	Si-14 Jan 93 R-3 Sep 96	Si-17 Jun 25 R-9 Apr 30
Indonesia	Si-20 Jun 72 R-19 Feb 92	Si-13 Jan 93 R-12 Nov 98	Su-21 Jan 71
Iran (Islamic Republic of)	Si-10 Apr 72 R-22 Aug 73	Si-13 Jan 93 R-3 Nov 97	Ac-5 Nov 29
Iraq	Si-11 May 72 R-18 Apr 91	—	Ac-8 Sep 31
Ireland	Si-10 Apr 72 R-27 Oct 72	Si-14 Jan 93 R-24 Jun 96	Ac-29 Aug 30
Israel	—	Si-13 Jan 93 R-	Ac-20 Feb 69

	BWC	CWC	GP
Italy	Si-10 Apr 72 R-30 May 75	Si-13 Jan 93 R-8 Dec 95	Si-17 Jun 25 R-3 Apr 28
Jamaica	Ac-13 Aug 75	Si-18 Apr 97 R-	Su-28 Jul 70
Japan	Si-10 Apr 72 R-8 Jun 82	Si-13 Jan 93 R-15 Sep 95	Si-17 Jun 25 R-21 May 70
Jordan	Si-10 Apr 72 R-30 May 75	Ac-29 Oct 97	Ac-20 Jan 77
Kazakhstan	—	Si-14 Jan 93 R-22 Mar 00	—
Kenya	Ac-7 Jan 76	Si-15 Jan 93 R-25 Apr 97	Ac-6 Jul 70
Kiribati	—	—	—
Kuwait	Si-14 Apr 72 R-18 Jul 72	Si-27 Jan 93 R-28 May 97	Ac-5 Dec 71
Kyrgyzstan	—	Si-22 Feb 93 R-	—
Lao People's Democratic Republic	Si-10 Apr 72 R-20 Mar 73	Si-12 May 93 R-25 Feb 97	Ac-20 May 89
Latvia	Ac-6 Feb 97	Si-6 May 93 R-23 Jul 96	Si-17 Jun 25 R-3 Jun 31
Lebanon	Si-10 Apr 72 R-26 Mar 75	—	Ac-17 Apr 69
Lesotho	Si-10 Apr 72 R-6 Sep 77	Si-7 Dec 94 R-7 Dec 94	Su-10 Mar 72
Liberia	Si-10 Apr 72 R-	Si-15 Jan 93 R-	Ac-17 Jun 27
Libyan Arab Jamahiriya	Ac-19 Jan 82	—	Ac-29 Dec 71
Liechtenstein	Ac-31 May 91	Si-21 Jul 93 R-24 Nov 99	Ac-6 Sep 91
Lithuania	Ac-10 Feb 98	Si-13 Jan 93 R-15 Apr 98	Si-17 Jun 25 R-15 Jun 33
Luxembourg	Si-10 Apr 72 R-23 Mar 76	Si-13 Jan 93 R-15 Apr 97	Si-17 Jun 25 R-1 Sep 36
Madagascar	Si-13 Oct 72 R-	Si-15 Jan 93 R-	Ac-2 Aug 67
Malawi	Si-10 Apr 72 R-	Si-14 Jan 93 R-11 Jun 98	Ac-14 Sep 70
Malaysia	Si-10 Apr 72 R-6 Sep 91	Si-13 Jan 93 R-20 Apr 00	Ac-10 Dec 70
Maldives	Ac-1 Jul 93	Si-1 Oct 93 R-31 May 94	Su-27 Dec 66
Mali	Si-10 Apr 72 R-	Si-13 Jan 93 R-28 Apr 97	—
Malta	Si-11 Sep 72 R-7 Apr 75	Si-13 Jan 93 R-28 Apr 97	Su-15 Oct 70 [21 Sep 64]
Marshall Islands	—	Si-13 Jan 93 R-	—
Mauritania	—	Si-13 Jan 93 R-9 Feb 98	—
Mauritius	Si-10 Apr 72 R-7 Aug 72	Si-14 Jan 93 R-9 Feb 93	Su-8 Jan 71 [12 Mar 68]
Mexico	Si-10 Apr 72 R-8 Apr 74	Si-13 Jan 93 R-29 Aug 94	Ac-28 May 32
Micronesia (Federated States of)	—	Si-13 Jan 93 R-21 Jun 99	—
Monaco	Ac-30 Apr 99	Si-13 Jan 93 R-1 Jun 95	Ac-6 Jan 67
Mongolia	Si-10 Apr 72 R-5 Sep 72	Si-14 Jan 93 R-17 Jan 95	Ac-6 Dec 68
Morocco	Si-2 May 72 R-	Si-13 Jan 93 R-28 Dec 95	Ac-13 Oct 70
Mozambique	—	—	—
Myanmar	Si-10 Apr 72 R-	Si-14 Jan 93 R-	—
Namibia	—	Si-13 Jan 93 R-27 Nov 95	—
Nauru	—	Si-13 Jan 93 R-	—
Nepal	Si-10 Apr 72 R-	Si-19 Jan 93 R-18 Nov 97	Ac-9 May 69
Netherlands	Si-10 Apr 72 R-22 Jun 81	Si-14 Jan 93 R-30 Jun 95	Si-17 Jun 25 R-31 Oct 30
New Zealand	Si-10 Apr 72 R-13 Dec 72	Si-14 Jan 93 R-15 Jul 96	Ac-24 May 30
Nicaragua	Si-10 Apr 72 R-7 Aug 75	Si-9 Mar 93 R-5 Nov 99	Si-17 Jun 25 R-5 Oct 90

	BWC	CWC	GP
Niger	Si-21 Apr 72 R-23 Jun 72	Si-14 Jan 93 R-9 Apr 97	Su-5 Apr 67
Nigeria	Si-6 Dec 72 R-3 Jul 73	Si-13 Jan 93 R-20 May 99	Ac-15 Oct 68
Niue†	—	—	—
Norway	Si-10 Apr 72 R-1 Aug 73	Si-13 Jan 93 R-7 Apr 94	Si-17 Jun 25 R-27 Jul 32
Oman	Ac-31 Mar 92	Si-2 Feb 93 R-8 Feb 95	—
Pakistan	Si-10 Apr 72 R-25 Sep 74	Si-13 Jan 93 R-28 Oct 97	Su-15 Apr 60
Palau	—	—	—
Panama	Si-2 May 72 R-20 Mar 74	Si-16 Jun 93 R-7 Oct 98	Ac-4 Dec 70
Papua New Guinea	Ac-27 Oct 80	Si-14 Jan 93 R-17 Apr 96	Ac-2 Sep 80
Paraguay	Ac-9 Jun 76	Si-14 Jan 93 R-1 Dec 94	Ac-22 Oct 33
Peru	Si-10 Apr 72 R-11 Jun 85	Si-14 Jan 93 R-20 Jul 95	Ac-5 Jun 85
Philippines	Si-10 Apr 72 R-21 May 73	Si-13 Jan 93 R-11 Dec 96	Ac-8 Jun 73
Poland	Si-10 Apr 72 R-25 Jan 73	Si-13 Jan 93 R-23 Aug 95	Si-17 Jun 25 R-4 Feb 29
Portugal	Si-29 Jan 72 R-13 May 73	Si-13 Jan 93 R-10 Sep 96	Si-17 Jun 25 R-1 Jul 30
Qatar	Si-14 Nov 72 R-17 Apr 75	Si-1 Feb 93 R-3 Sep 97	Ac-18 Oct 76
Republic of Korea	Si-10 Apr 72 R-25 Jan 87	Si-14 Jan 93 R-28 Apr 97	Ac-4 Jan 89
Republic of Moldova	—	Si-13 Jan 93 R-8 Jul 96	—
Romania	Si-10 Apr 72 R-25 July 79	Si-13 Jan 93 R-15 Feb 95	Si-17 Jun 25 R-23 Aug 29
Russian Federation	Si-10 Apr 72 R-26 Mar 75	Si-13 Jan 93 R-5 Nov 97	Ac-5 Apr 28
Rwanda	Si-10 Apr 72 R-20 May 75	Si-17 May 93 R-	Su-11 May 64
Saint Kitts and Nevis	Ac-2 Apr 91	Si-16 Mar 94 R-	Su-27 Apr 89
Saint Lucia	Ac-26 Nov 86	Si-29 Mar 93 R-9 Apr 97	Su-21 Dec 88
Saint Vincent and the Grenadines	Ac-13 May 99	Si-20 Sep 93 R-	Su-24 Mar 99
Samoa	—	Si-14 Jan 93 R-	—
San Marino	Si-12 Sep 72 R-11 Mar 75	Si-13 Jan 93 R-10 Dec 99	—
Sao Tome and Principe	Ac-24 Aug 79	—	—
Saudi Arabia	Si-12 Apr 72 R-24 May 72	Si-20 Jan 93 R-9 Aug 96	Ac-27 Jan 71
Senegal	Si-10 Apr 72 R-26 Mar 75	Si-13 Jan 93 R-20 Jul 98	Ac-15 Jun 77
Seychelles	Ac-11 Oct 79	Si-15 Jan 93 R-7 Apr 93	—
Sierra Leone	Si-7 Nov 72 R-29 Jun 76	Si-15 Jan 93 R-	Ac-20 Mar 67
Singapore	Si-19 Jun 72 R-2 Dec 75	Si-14 Jan 93 R-21 May 97	—
Slovak Republic	Su-17 Mar 93 [wef 1 Jan 93]	Si-14 Jan 93 R-27 Oct 95	Su-20 Sep 93 [wef 1 Jan 93]
Slovenia	Su-7 Apr 92 [wef 25 Jan 91]	Si-14 Jan 93 R-11 Jun 97	—
Solomon Islands	Ac-17 Jun 81	—	Su-1 Jun 81
Somalia	Si-3 July 72 R-	—	—
South Africa	Si-10 Apr 72 R-3 Nov 75	Si-14 Jan 93 R-13 Sep 95	Ac-24 May 30
Spain	Si-10 Apr 72 R-20 Jun 79	Si-13 Jan 93 R-3 Aug 94	Si-17 Jun 25 R-22 Aug 29
Sri Lanka	Si-10 Apr 72 R-18 Nov 86	Si-14 Jan 93 R-19 Aug 94	Ac-20 Jan 54
Sudan	—	Ac-24 May 99	Ac-17 Dec 80
Suriname	Ac-9 Apr 92	Si-28 Apr 97 R-28 Apr 97	—

	BWC	CWC	GP
Swaziland	Ac-18 Jun 91	Si-23 Sep 93 R-20 Nov 96	Ac-23 Jul 91
Sweden	Si-27 Feb 75 R-5 Feb 76	Si-13 Jan 93 R-17 Jun 93	Si-17 Jun 25 R-25 Apr 30
Switzerland†	Si-10 Apr 72 R-4 May 76	Si-14 Jan 93 R-10 Mar 95	Si-17 Jun 25 R-12 Jul 32
Syrian Arab Republic	Si-14 Apr 72 R-	—	Ac-17 Dec 68
Tajikistan	—	Si-14 Jan 93 R-11 Jan 95	—
Thailand	Si-17 Jan 73 R-28 May 75	Si-14 Jan 93 R-	Si-17 Jun 25 R-6 Jun 31
The former Yugoslav Republic of Macedonia	Ac-26 Dec 96	Ac-20 Jun 97	—
Togo	Si-10 Apr 72 R-10 Nov 76	Si-13 Jan 93 R-23 Apr 97	Ac-5 Apr 71
Tonga	Su-28 Sep 76	—	Su-19 Jul 71
Trinidad and Tobago	—	Ac-24 Jun 97	Su-30 Nov 70 [wef 31 Aug 62]
Tunisia	Si-10 Apr 72 R-18 May 73	Si-13 Jan 93 R-15 Apr 97	Ac-12 Jul 67
Turkey	Si-10 Apr 72 R-4 Nov 74	Si-14 Jan 93 R-12 May 97	Si-17 Jun 25 R-5 Oct 29
Turkmenistan	Ac-11 Jan 96	Si-12 Oct 93 R-29 Sep 94	—
Tuvalu†	—	—	—
Uganda	Ac-12 May 92	Si-14 Jan 93 R-	Ac-24 May 65
Ukraine	Si-10 Apr 72 R-26 Mar 75	Si-13 Jan 93 R-16 Oct 98	—
United Arab Emirates	Si-28 Sep 72 R-	Si-2 Feb 93 R-	—
United Kingdom	Si-10 Apr 72 R-26 Mar 75	Si-13 Jan 93 R-13 May 96	Si-17 Jun 25 R-9 Apr 30
United Republic of Tanzania	Si-16 Aug 72 R-	Si-25 Feb 94 R-25 Jun 98	Ac-22 Apr 63
United States of America	Si-10 Apr 72 R-26 Mar 75	Si-13 Jan 93 R-25 Apr 97	Si-17 Jun 25 R-10 Apr 75
Uruguay	Ac-6 Apr 81	Si-15 Jan 93 R-6 Oct 94	Si-17 Jun 25 R-12 Apr 77
Uzbekistan	Ac-12 Jan 96	Si-24 Nov 95 R-23 Jul 96	—
Vanuatu	Ac-12 Oct 90	—	—
Venezuela	Si-10 Apr 72 R-18 Oct 78	Si-14 Jan 93 R-3 Dec 97	Si-17 Jun 25 R-8 Feb 28
Viet Nam	Ac-20 Jun 80	Si-13 Jan 93 R-30 Sep 98	Ac-15 Dec 80
Yemen	Si-10 Apr 72 R-1 Jun 79	Si-8 Feb 93 R-	Ac-17 Mar 71
Yugoslavia, Federal Republic of	Si-10 Apr 72 R-25 Oct 73	Ac-20 Apr 00	Si-17 Jun 25 R-12 Apr 29
Zambia	—	Si-13 Jan 93 R-	—
Zimbabwe	Ac-5 Nov 90	Si-13 Jan 93 R-25 Apr 97	—

Notes:

[1.] With regard to the Geneva Protocol, the People's Republic of China stated on 13 July 1952 that it "recognized itself bound by the accession effected on behalf of China on 24 August 1929". With regard to the BWC, the People's Republic of China stated on accession (15 Nov 84): "The signature and ratification of the Convention by the Taiwan authorities in the name of China on 10 April 1972 and 9 February 1973 are illegal and null and void".

[2.] Ambiguous.

Ac—Accession
R—Ratification
Si—Signature
Su—Succession
wef—with effect from
†—Not a member of the UN

This list is produced in the same alphabetical order as that of the list of members of the United Nations. Dates given are the earliest date of deposit of the relevant instrument with any of the depositaries. **NB:** not all entities in this list are recognized as states by all other states. Care should therefore be exercised when attempting to give the number of parties (or non-parties) to a treaty.

This list is excerpted from a Diplomatic Brief publication in preparation — "Science & Technology for Diplomats and Negotiators". Diplomatic Brief is a new project being established by Richard Guthrie.

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Forthcoming events

In Germany, at Schloß Sachsenburg, Frankenberg/Sachsen, an exhibition on biological weapons and their history, *Schwarzer Tod und Amikäfer*, is running during 20 May-31 October.

and the possibility of a further two-week session interposed between the two.

The EXPO2000 *Second International Symposium on Destruction of Chemical Weapons* will be held in Munster, Germany, during 30 July-3 August. Enquiries to fax: **49-5192 136508 or volkerstarrock@bwb.org

The twentieth session of the OPCW Executive Council will be held in The Hague on 27-28 June, with subsequent sessions during 3-6 October, and 5-8 December.

A Wilton Park conference *The Growing Danger of Biological Weapons* will take place at Wiston House, England during 29 September-1 October 2000. Enquiries to: fax +44 1903

The twentieth session of the BWC Ad Hoc Group will be held in Geneva during 10 July-4 August, with the next scheduled for 13-24 November

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About this Issue

The Chemical Weapons Convention is fast turning the corner towards success. This is most evident in the fact that, by May, all of its parties had at last submitted their initial declarations. True, there are divergences between the treaty as negotiated and the treaty as now being implemented, the effect of which may even be to weaken the inspection regime established by the treaty. And major tests lie ahead, such as the first request for a challenge inspection or for an amendment responsive to technological change. But a robustness can now be seen in the organization and procedures of the CWC regime that bodes well. It suggests, moreover, the existence of lessons to be learned from the CWC that may benefit less buoyant areas of arms control and dual-technology governance.

So the Harvard Sussex Program is making space in this issue of its *Bulletin* for an authoritative review of the entire CWC enterprise. This is accompanied by synoptic analyses of two adjacent areas of concern: biological weapons, and the options, including use of nuclear weapons, for responding to chemical or biological warfare.

This departure from our normal practice of presenting rather short policy-orientated invited articles has meant that the present issue does not contain the usual excerpt from our *CBW Events Database*. If any subscribers are inconvenienced by the absence of the *News Chronology* section, will they please communicate with its compiler, Julian Perry Robinson, preferably via e-mail to j.p.p.robinson@sussex.ac.uk

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