

16. Chemical and biological weapon developments and arms control

JOHN HART, FRIDA KUHLAU and JACQUELINE SIMON

I. Introduction

In 2002 the United States and, to varying degrees, a number of other countries continued to shift their policies away from reliance on traditional multilateral arms control and disarmament regimes towards a greater emphasis on bilateral and regional efforts to ensure that national measures to criminalize the possession, development and use of chemical and biological weapon (CBW) agents are undertaken. Attention was also focused on international activities such as the harmonization and strengthening of export control regulations, improving national and international disease surveillance, preparing for emergencies and response measures.

The states parties to the 1972 Biological and Toxin Weapons Convention (BTWC)¹ concluded the resumed session of the Fifth Review Conference in 2002. (The first session had been abruptly suspended in 2001.) The review conference agreed to hold expert meetings and annual meetings of the parties until the Sixth Review Conference convenes in 2006. In early 2002 the Organisation for the Prohibition of Chemical Weapons (OPCW), the body that oversees implementation of the 1993 Chemical Weapons Convention (CWC),² faced financial and organizational problems. However, the Seventh Conference of the States Parties (CSP), which met in October, took steps to ease these difficulties. In April the OPCW Director-General was voted out of office at a Special Session of the CSP. The CWC is now a well-established treaty and, for the first time, large-scale destruction operations are under way in all four declared chemical weapon (CW) possessor states.³

The use of chemical and biological substances for law enforcement purposes received increased attention in 2002 because of new information about US

¹ The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction is reproduced on the SIPRI Chemical and Biological Warfare Project Internet site at URL <<http://projects.sipri.se/cbw/docs/bw-btwc-text.html>>. Complete lists of parties, signatory and non-signatory states are available on the SIPRI CBW Project Internet site at URL <<http://projects.sipri.se/cbw/docs/bw-btwc-mainpage.html>>. See also annex A in this volume.

² The Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (corrected version), is reproduced at URL <<http://projects.sipri.se/cbw/docs/cw-cwc-texts.html>>. The 31 Oct. 1999 amendment to Part VI of the Verification Annex of the CWC is reproduced at URL <<http://projects.sipri.se/cbw/docs/cw-cwc-verannex5bis.html>>. Complete lists of parties, signatory and non-signatory states are available on the SIPRI CBW Project Internet site at URL <<http://projects.sipri.se/cbw/docs/cw-cwc-mainpage.html>>. See also annex A in this volume.

³ India, South Korea, Russia and the USA have declared that they possess CW.

non-lethal weapon programmes and the use of a chemical by Russia against Chechen hostage takers in a Moscow theatre in October 2002.⁴

In September US-led pressure in the UN Security Council and elsewhere resulted in the unanimous adoption of a new resolution on Iraq and, as a result, UN Monitoring, Verification and Inspection Commission (UNMOVIC) inspectors were allowed, for the first time, to resume the work of the former UN Special Commission on Iraq (UNSCOM).⁵ There was disagreement in the Security Council on what evidence or behaviour by Iraq would justify a military attack and what, if any, further UN decisions this would require. The inspections highlighted the problem of verifying compliance with the implementation of relevant UN resolutions in a country whose 'active and full' cooperation was questioned.

Section II of this chapter deals with the results of the reconvened session of the Fifth Review Conference of the BTWC. CWC-related developments are described in section III. Section IV describes non-lethal weapon programmes and their relation to the BTWC and the CWC and discusses the use of toxic chemicals for law enforcement purposes, including the use by Russia to end a hostage situation. Section V covers the CBW dimension of international efforts to disarm Iraq. Section VI summarizes developments related to anti-terrorism. Proliferation allegations are covered and information on past programmes provided in section VII. Section VIII presents the conclusions.

II. Biological weapon disarmament

The BTWC entered into force on 26 March 1975. In 2002 the Holy See and Morocco ratified the convention, bringing its membership to 147 states.⁶ As of 1 January 2003, 18 states were signatories to the BTWC, while 31 countries had not signed the convention.⁷ In 2002 South Korea withdrew its reservation to the 1925 Geneva Protocol with regard to biological weapons (BW).⁸

The Fifth Review Conference of the States Parties to the BTWC

The Fifth Review Conference of the States Parties to the BTWC reconvened in plenary session on 11 November 2002, almost a year after its abrupt suspension on 7 December 2001. It had been suspended following a proposal by the

⁴ See also chapters 1 and 2 in this volume.

⁵ See also chapter 1 in this volume.

⁶ List of States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, BTWC Review Conference document BWC/CONF.V/INF.4, 25 Oct. 2002. The document lists 146 parties, excluding Taiwan, which ratified the BTWC in 1973 but is not a UN member state. There were no additional ratifications or accessions to the BTWC between 25 Oct. and 31 Dec. 2002.

⁷ See note 1.

⁸ South Korea had reserved the right not to observe the prohibitions contained in the Geneva Protocol if an enemy state or its allies were not party to the protocol. United Nations, Department of Disarmament Affairs, 'Biological weapons conference reaches agreement on future work', 15 Nov. 2002, URL <<http://www.unog.ch/news2/documents/newsen/dc0241e.htm>>. As a party to the CWC, South Korea is prohibited from using chemical weapons.

USA to end the mandate of the Ad Hoc Group (AHG) under which the BTWC parties had been negotiating a protocol to strengthen compliance with the treaty. In August 2001 the USA had also rejected the draft protocol largely because it claimed that the protocol did not ensure compliance, risked revealing confidential business information and sensitive information regarding bio-defence activities and might weaken national export controls.⁹ The US proposal to end the AHG negotiation mandate in December 2001 was unexpected and was met with shock and anger by most BTWC parties. The review conference was adjourned partly in an attempt to keep open the option of continued AHG negotiations.¹⁰

In April 2002 the UK released a Green Paper that reviewed the BW threat and related British policies. It identified a range of potential measures to strengthen the BTWC including: development of national implementing legislation, including criminalization of activities prohibited by the BTWC; implementation of codes of conduct and disease surveillance activities; and adoption of revised and strengthened confidence-building measures.¹¹ Two other proposals were made to strengthen treaty compliance: to negotiate an international agreement, and to expand and revise existing mechanisms which would enable the UN Secretary-General to investigate suspected BTWC violations.¹² The Green Paper noted that such an international agreement would not easily be negotiated unless it included scientific and technological assistance provisions. It also suggested that annual review meetings be held by national technical experts 'tasked with limited and focussed mandates'.¹³

A September 2002 report by the US General Accounting Office provided a detailed comparison of the British proposals with those submitted by the USA to the 2001 session of the Fifth Review Conference. The principal difference between the US proposals for strengthening the treaty and those of the UK and others was whether they should be mandated in the form of a treaty or voluntarily implemented on a national basis. The report also questioned the assertion made by the US State Department at the 2001 review conference that

⁹ Zanders, J. P., Hart, J. and Kuhlau, F., 'Chemical and biological weapon developments and arms control', *SIPRI Yearbook 2002: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2002), pp. 667–78; and Feakes, D. and Littlewood, J., 'Hope and ambition turn to dismay and neglect: the Biological and Toxin Weapons Convention in 2001', *Medicine, Conflict and Survival*, vol. 18 (2002), pp. 161–74.

¹⁰ The AHG mandate was approved by consensus at the Special Conference of the BTWC parties in 1994 and can only be terminated by consensus.

¹¹ British Foreign and Commonwealth Office, 'Strengthening the Biological and Toxin Weapons Convention: countering the threat from biological weapons', Apr. 2002, URL <<http://www.fco.gov.uk/Files/kfile/btwc290402.pdf>>.

¹² Toxins are covered by both the BTWC and the CWC. If the alleged use fell under the jurisdiction of the CWC, legal decisions, including a possible amendment to the CWC, would probably be required to give the Secretary-General clear legal authority to initiate such an investigation. In the early 1980s to the early 1990s the Secretary-General initiated processes for investigating allegations of CBW use in Africa, Armenia, Iran, Iraq and South-East Asia within the UN framework. British Foreign and Commonwealth Office (note 11), p. 14.

¹³ British Foreign and Commonwealth Office (note 11), p. 17.

some procedures in the draft protocol could have been used to override national export control decisions.¹⁴

On 2 September 2002 a set of US talking points for the resumed session intended for distribution to members of the Western Group was widely disseminated outside the group.¹⁵ The non-paper expressed the US preference for the shortest possible resumed session and stated that the outcome of the review conference should be limited to agreeing that no further meetings of the BTWC parties should be held until the Sixth Review Conference, in 2006. If this condition were met, the USA would agree not to ‘name names’ of countries that it believed or suspected to be treaty violators and would make no explicit reference to its proposal to end the AHG’s mandate.¹⁶ Furthermore, the talking points stated that if the Fifth Review Conference were not ‘very short’¹⁷ the USA would again seek to terminate the AHG mandate. However, when the review conference resumed it was evident that the USA had changed its position against holding annual meetings before the Sixth Review Conference and on attempting to revoke the AHG mandate.

In the interval between the two sessions of the review conference, AHG chairman and Fifth Review Conference president Ambassador Tibor Tóth of Hungary had conducted extensive consultations with the BTWC parties in an attempt to broker agreement on key issues—especially on a process to complement the holding of review conferences. At the start of the resumed session of the Fifth Review Conference Tóth noted the unusual and difficult circumstances in which the conference found itself and outlined a plan of work. Tóth proposed annual meetings and stated that he believed that the resumed session should focus on reaching agreement on this limited measure, rather than on revisiting perceived past disappointments.

The proposal, widely regarded as being crafted to secure US acquiescence, was adopted by consensus. It called for the parties to hold three annual meetings before the Sixth Review Conference, which is to be held no later than 2006.¹⁸ Each meeting of the parties is to be preceded by a two-week meeting of national experts, who will prepare factual background materials to assist the work of the annual meetings. Decisions in the expert group and annual meetings are to be made by consensus. The mandate of the annual meetings is ‘to discuss, and promote common understanding and effective action’ on:

i. the adoption of necessary national measures to implement the prohibitions set forth in the Convention, including the enactment of penal legislation [2003];

¹⁴ US General Accounting Office (GAO), *Arms Control: Efforts to Strengthen the Biological Weapons Convention*, GAO-02-1038 (US General Accounting Office: Washington, DC, Sep. 2002), p. 21.

¹⁵ USA, ‘U.S. Biological Weapons Convention talking points’, 2 Sep. 2002, circulated via the SIPRI CBW discussion forum.

¹⁶ USA (note 15).

¹⁷ The non-paper defined a ‘very short RevCon’ as ‘one with the sole purpose and outcome of agreeing to hold a RevCon in 2006’. USA (note 15).

¹⁸ Ruppe, D., Global Security Newswire, ‘BWC I, Review Conference reconvenes: Toth introduces proposal’, 11 Nov. 2002, URL <http://www.nti.org/d_newswire/issues/2002/11/11/5p.html>; and Arms Control Association, ‘Arms control experts call bio-weapons conference chair’s proposal “useful but insufficient”’, 8 Nov. 2002, URL <<http://www.armscontrol.org/pressroom/2002/bwc2nov.asp>>.

- ii. national mechanisms to establish and maintain the security and oversight of pathogenic microorganisms and toxins [2003];
- iii. enhancing international capabilities for responding to, investigating and mitigating the effects of cases of alleged use of biological or toxin weapons or suspicious outbreaks of disease [2004];
- iv. strengthening and broadening national and international institutional efforts and existing mechanisms for the surveillance, detection, diagnosis and combating of infectious diseases affecting humans, animals and plants [2004]; and
- v. the content, promulgation, and adoption of codes of conduct for scientists [2005].¹⁹

Most discussions at the review conference took place in the regional group caucuses.²⁰ Members of the Western Group refused to negotiate any changes to the proposal; the bulk of the president's efforts were therefore devoted to securing the agreement of the Non-Aligned Movement (NAM)²¹ and Other States Group. The manner in which the proposal was placed before the NAM (i.e., to either accept or reject it as written) generated resentment both within the group and among other parties.²² Several members of NAM, including India, Pakistan and Iran, urged that specific provisions on cooperation and technological assistance be included in the proposal.²³

It was understood that the NAM Group's acceptance was contingent on its being permitted to make a formal statement at the closing session of the conference so that it could register its reservations and concerns. The NAM Group coordinator (South Africa) took the floor following the group's acceptance of the proposal on 14 November to express its disappointment in the limited nature of the proposal and the failure of both the AHG and the review conference to agree on more substantial measures to strengthen the BTWC. The NAM coordinator also noted that the primary focus of the group would be on the agreement of such measures through multilateral, non-discriminatory, legally binding provisions and that this would be the only effective way to prevent biological warfare in the long term.²⁴ The Western Group issued a statement welcoming the new plan of action as a qualitatively different outcome to

¹⁹ UN Department of Disarmament Affairs, Final Document of the Fifth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) Weapons and on Their Destruction, BTWC Review Conference document BWC/CONF.V/17, Nov. 2002, pp. 3–4, available at <<http://disarmament.un.org/wmd/bwc/pdf/bwccnfv17.PDF>>.

²⁰ Ruppe, D., Global Security Newswire, 'BWC: states dispute plan for future meetings', 13 Nov. 2002, URL <http://www.nti.org/d_newswire/issues/2002/11/13/11p.html>.

²¹ The members of the NAM are listed in the glossary in this volume.

²² Ruppe (note 20).

²³ 'Nations agree talks to try to boost germ war ban', *New York Times* (Internet edn), 14 Nov. 2002, URL <<http://www.nytimes.com/reuters/news/news-arms-biological.html>>. A number of countries, including NAM Group members, call for the abolishment of the Australia Group (AG) and other export control mechanisms in favour of the import/export restrictions and related commitments contained in multilateral agreements such as the CWC or the BTWC. The nature and purpose of the AG go to the heart of a broader international political debate on how national export controls could or should be reconciled with commitments undertaken within multilateral arms control and disarmament treaty regimes designed to promote international cooperation on and exchange of information, technology and materials (some of which are dual-use) for peaceful purposes. See also chapter 18 in this volume.

²⁴ UN Department of Disarmament Affairs (note 8).

that of previous review conferences. Both statements became official documents at the request of the NAM Group and the Western Group.²⁵

The final session of the Fifth Review Conference also approved the budget proposal for the follow-up work and the Final Document of the Conference.²⁶ The first expert group meeting is expected to be held in August–September 2003, and the first annual meeting of the BTWC parties is planned for November 2003. The review conference decided that the first annual meeting should be chaired by a representative of the Eastern Group; Tóth was elected to this position by acclamation and began his work immediately. The early conclusion of the formal part of the Fifth Review Conference provided an opportunity for additional consultations, and Tóth held 36 bilateral meetings in the week after the review conference to discuss organizational and procedural matters related to the expert group meetings and annual meetings of the BTWC parties.²⁷

Although the parties will continue to meet periodically to consider both the political and technical aspects of BTWC implementation between review conferences, it remains to be seen how this process will differ from or be similar to the work of the previous AHG. In particular, it is unclear whether the BTWC parties will undertake the necessary preparations and be sufficiently flexible and cooperative to achieve useful outcomes at annual meetings. However, the newly agreed framework providing for annual meetings allows the parties to undertake specific measures within a multilateral framework as political and technical circumstances warrant. Such meetings will, for example, provide a mechanism to allow the treaty regime to respond more quickly and effectively to changing scientific and technological challenges than would be possible if the parties were to meet in regular session at review conferences only.

III. Chemical weapon disarmament

The Seventh Conference of the States Parties, which met on 7–11 October 2002, addressed a number of organizational problems. Action was taken to

²⁵ UN Department of Disarmament Affairs, Statement on behalf of the Non-Aligned Movement and Other States to the Fifth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, BTWC Review Conference document BWC/CONF.V/15, 14 Nov. 2002, URL <http://www.brad.ac.uk/acad/sbtwc/revconf/CONF_V_15.htm>; and UN Department of Disarmament Affairs, Statement on behalf of the Western European and Other Group of States to the Fifth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, BTWC Review Conference document BWC/CONF.V/16, 14 Nov. 2002.

²⁶ UN Department of Disarmament Affairs, Estimated costs of meetings in 2003, 2004 and 2005 of the states parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, BTWC Review Conference document BWC/CONF.V/14, Geneva, 13 Nov. 2002; and BTWC Review Conference document BWC/CONF.V/17 (note 19).

²⁷ Pearson, G., 'Report from Geneva—Friday, 22 November 2002', Department of Peace Studies, Bradford University, 22 Nov. 2002, URL <http://www.brad.ac.uk/acad/sbtwc/prgenova/genrep22%20Nov02_2.htm>.

ease the OPCW's financial situation for 2003 thanks, in part, to payment of past due accounts by some parties and voluntary contributions to the 2003 budget, including one of \$2 million from the USA.²⁸ As of 9 January 2003, 148 states had ratified or acceded to the CWC and a further 26 states had signed it,²⁹ while 20 countries had neither signed nor ratified the CWC.³⁰

The Special Session of the Conference of the States Parties to the CWC

In early 2002 it became publicly known that the USA and a number of other states sought the resignation of OPCW Director-General José M. Bustani. After failing to persuade him to step down during the 28th session of the Executive Council (EC), which ended on 22 March, the USA informed the other EC members that it had requested a special session of the CSP to consider the matter.³¹ On 21–24 April the first Special Session of the CSP was convened to consider Bustani's tenure and 'any further action regarding the Technical Secretariat'. The motion to remove Bustani required at least a two-thirds majority vote to pass; the CSP decided on 22 April to end Bustani's tenure 'effective immediately'³² by a vote of 48 states in favour, 7 opposed and 43 abstentions.³³ On 25 July the CSP reconvened and appointed, by acclamation, Ambassador Rogelio Pfirter of Argentina as the new director-general.³⁴ The USA welcomed his appointment.³⁵

The process leading to Bustani's removal caused concern. Of particular note was the apparent willingness of the USA to refuse to pay its assessed contribution and suspend its participation in the CWC if Bustani was not replaced. Concern was also expressed about the possible long-term implications of a criticism—contained in a US non-paper listing reasons why Bustani should be removed—that Bustani was 'downplaying' the OPCW's non-proliferation and

²⁸ On the OPCW's financial status and budgetary difficulties see Audited financial statements of the Organisation for the Prohibition of Chemical Weapons and the provident fund of the Organisation for the Prohibition of Chemical Weapons for the period ended 31 December 2001, OPCW document EC-29/DG.8, C-7/DG.1, 14 June 2002; and Zanders, Hart and Kuhlau (note 9), pp. 683–85.

²⁹ Saint Vincent and the Grenadines and Samoa became parties in 2002; Thailand became a party on 9 Jan. 2003.

³⁰ The states which have not signed or ratified the CWC are Andorra, Angola, Antigua and Barbuda, Barbados, Belize, Egypt, Iraq, North Korea, Lebanon, Libya, Niue, Palau, Sao Tome and Principe, Solomon Islands, Somalia, Syria, Timor-Leste (formerly East Timor), Tonga, Tuvalu and Vanuatu.

³¹ 'News chronology', *CBW Conventions Bulletin*, no. 56 (June 2002), p. 35. In accordance with the OPCW rules of procedure, a special session may be convened at the request of 1 or more parties and provided the request is supported by at least a third of the OPCW's membership. Note by the Director-General, provisional agenda of the First Session of the Conference of the States Parties, OPCW document C-SS-1/1, 3 Apr. 2002, para. 2.

³² Decision under item 3 of the agenda of the First Special Session of the Conference of the States Parties, OPCW document C-SS-1/DEC.1, 22 Apr. 2002. For a voting record see US Department of State, 'Removal of OPCW Technical Secretariat Director-General Jose Bustani', URL <<http://www.state.gov/t/ac/cwc/fs/9631.htm>>.

³³ The 7 opposed states were Belarus, Brazil, China, Cuba, Iran, Mexico and Russia.

³⁴ OPCW, 'OPCW Special Session appoints Director-General', Press Release no. 51, 25 July 2002.

³⁵ 'U.S. welcomes new head of chemical weapons organization', *Washington File* (US Department of State, International Information Program: Washington, DC, 25 July 2002).

verification roles.³⁶ Some states perceived this as a criticism of Bustani's efforts to give greater emphasis to the OPCW's international cooperation and assistance programmes.³⁷

The decision to remove Bustani became increasingly politicized when Bustani indicated in early 2002 that he would not resign because several states suggested that he should. He took the view that the CSP should determine his future because it had appointed him. (The EC and the CSP are the OPCW's policy-making bodies; the director-general oversees the secretariat's implementation of the policies.) The dispute was partly a reflection of disagreement over where OPCW policy making ends and where CWC implementation begins. Bustani was blamed by some for his handling of internal administrative and personnel matters, including the OPCW's 2000–2002 financial crisis. There was also disagreement over whether the director-general was authorized to make certain types of policy statements (e.g., on the desirability of Iraq's possible accession to the CWC),³⁸ and whether he had properly consulted with the parties on specific matters, such as the OPCW's 2001 anti-terrorism initiative.³⁹ It is unclear whether any specific action (or inaction) precipitated the effort to remove Bustani and why the effort was undertaken when it was.⁴⁰

The Seventh Conference of the States Parties to the CWC

A range of interconnected CWC issues relate to the cost, scope and intrusiveness of OPCW activities necessary for effective treaty implementation. The main areas considered by the Seventh CSP were: the importance of the timely destruction of CW stockpiles, particularly in Russia;⁴¹ remedying structural problems that contributed to the organization's recent financial crisis;⁴² agreeing the programme and budget for 2003, including the allocation of inspection

³⁶ USA, 'Preserving the Chemical Weapons Convention: the need for a new OPCW Director-General', US non-paper, unclassified, unpublished, 6 Mar. 2002.

³⁷ 'US diplomatic offensive removes OPCW Director-General', *Disarmament Diplomacy*, no. 63 (May/June 2002), pp. 28–33.

³⁸ For the first time, Iraq sent an observer to the Seventh CSP.

³⁹ On the allegations against Bustani and his responses see Note by the Director-General, information relevant to item 3 of the provisional agenda of the First Special Session of the Conference of the States Parties, OPCW document C-SS-1/DG.1, 17 Apr. 2002; Statement by the Director-General at the Special Session of the Conference of the States Parties, OPCW document C-SS-1/DG.7, 21 Apr. 2002; Bustani, J., 'Statement by the Director-General at the Special Session of the Conference of the States Parties', 21 Apr. 2002; 'Responses to the allegations against the Director-General of the OPCW', Paper circulated via the SIPRI CBW discussion forum; "'Highlights" of interview with OPCW General Director José Mauricio Bustani by Denise Chrispim Marin', *O Estado de S. Paulo* (São Paulo), 27 Mar. 2002, in 'Brazil: Bustani interviewed on US efforts to remove him from post', Foreign Broadcast Information Service, *Daily Report—The Americas (FBIS-LAT)*, FBIS-LAT-2002-0327, 28 Mar. 2002; 'Preserving the Chemical Weapons Convention . . .' (note 36); and Bradshaw, B., Parliamentary Under-Secretary of State, Foreign and Commonwealth Office, House of Commons Foreign Affairs Committee hearing, 23 Apr. 2002, circulated via the SIPRI CBW discussion forum.

⁴⁰ The Fifth CSP, held in May 2000, had unanimously re-elected Bustani to a second term.

⁴¹ The CWC requires that destruction of CW stockpiles be completed no later than 29 Apr. 2007. Extensions of up to 5 years (i.e., until 29 Apr. 2012) are possible if approved by the OPCW. Russia and the USA are unlikely to be able to destroy their stockpiles by either date. For CWC provisions on 'order of destruction' of CW and requests for permission for extensions on destruction deadlines see CWC, Verification Annex, Part IV(A), paras 15–28.

⁴² Zanders, Hart and Kuhlau (note 9), pp. 683–85.

resources for the various types of chemical industry facilities and plant sites;⁴³ and determining the degree to and manner in which technological development and cooperation activities, which are implemented by the OPCW's International Cooperation and Assistance (ICA) Division, should be supported.

While all parties view the timely destruction of CW stockpiles and former CW production capabilities as a core activity, groups of states perceive other activities as having varying degrees of importance. For example, developed and developing countries hold different views on the principle of the equitable geographic distribution of inspection resources directed towards the chemical industry and its implementation. The developing countries, in particular, also place great importance on the CWC's technological cooperation and assistance provisions. Each of the activities has significant budgetary and other resource implications; establishing an acceptable balance between them was the most difficult task faced by the CSP.

Among the decisions taken by the CSP in 2002 were those on: procedures for updating the list of approved equipment;⁴⁴ requests for approval to use nine former CW production facilities for non-prohibited purposes;⁴⁵ approval of a request by South Korea to extend an intermediate CW destruction deadline;⁴⁶

⁴³ A distinction is made between the terms 'facility' and 'plant' (or 'plant site'). 'Facility' always refers to Schedule 1 facilities, usually laboratories, while 'plant' refers to sites that produce, process or consume above certain quantities of Schedule 2 or Schedule 3 chemicals or sites that produce 'by synthesis' certain discrete organic chemicals that may contain the elements phosphorus, sulphur or fluorine (DOC/PSFs) above certain thresholds. See the discussion of schedules below. The views of the parties differed on the distribution and number of industry inspections that should be conducted in 2003, including according to type of facility or plant site.

⁴⁴ OPCW, Decision, procedures for updating the list of approved equipment, OPCW document C-7/DEC.20, 11 Oct. 2002. Inspection equipment must be properly maintained and periodically serviced and replaced to help ensure the effectiveness of inspections.

⁴⁵ All of the following OPCW decisions were dated 10 Oct. 2002: Decision, request by the Russian Federation for approval to use chemical weapons production facility (filling of mustard gas and lewisite mixture into munitions) at OJSC 'Khimprom', Volgograd for purposes not prohibited under the Convention, OPCW document C-7/DEC.5; Decision, request by the Russian Federation for approval to use a chemical weapons production facility (loading of chemical sub-munitions into munitions) at OJSC 'Khimprom', Novocheboksarsk for purposes not prohibited under the Convention, OPCW document C-7/DEC.6; Decision, request by the Russian Federation for approval to use a chemical weapons production facility (aminomercapton production) at OJSC 'Khimprom', Novocheboksarsk, for purposes not prohibited under the Convention, OPCW decision C-7/DEC.7; Decision, request by the Russian Federation for approval to use a chemical weapons production facility (chloroether production) at OJSC 'Khimprom', Novocheboksarsk, for purposes not prohibited under the Convention, OPCW document C-7/DEC.8; Decision, request by the Russian Federation for approval to use a chemical weapons production facility (sarin production) at OJSC 'Khimprom', Volgograd, for purposes not prohibited under the Convention, OPCW document C-7/DEC.9; Decision, request by the Russian Federation for approval to use a chemical weapons production facility (production of VX-substance and filling it into munitions), stage II: conversion of part of the auxiliary buildings 352 and 353, and of the ventilation stack 366B) at OJSC 'Khimprom', Novocheboksarsk for purposes not prohibited under the Convention, OPCW document C-7/DEC.10; Decision, request by the Russian Federation for approval to use a chemical weapons production facility (filling munitions with sarin, soman, and viscous soman, phase II: conversion of buildings 600, 603, 605, 605a) at OJSC 'Khimprom', Volgograd for purposes not prohibited under the Convention, OPCW document C-7/DEC.11; Decision, request by the Russian Federation for approval to use a chemical weapons production facility (lewisite production, second train) at OJSC 'Sibur-Neftekhim', 'Kaprolaktam' plant, Dzerzhinsk for purposes not prohibited under the Convention, OPCW document C-7/DEC.12; and Decision, request by the Russian Federation for approval to use a chemical weapons production facility (soman production) at OJSC 'Khimprom', Volgograd, for purposes not prohibited under the Convention, OPCW document C-7/DEC.13.

⁴⁶ OPCW, Decision, request by a state party to grant an extension of its obligation to meet the intermediate phase 2 deadline for destruction of Category 1 chemical weapons stockpiles, OPCW docu-

and authorization to withhold distribution of any cash surplus from 2001 pending further consideration of this matter at the Eighth CSP in 2003.⁴⁷ The OPCW's budget for 2003 is €68 562 966 (*c.* \$74 658 072), an approximately 9.9 per cent increase over 2002. The budget for the ICA programmes was increased by 12.4 per cent over 2002.⁴⁸ The increase in the overall budget, although significant, was insufficient to enable the secretariat to fund all of its approved staff posts, and a number of posts will continue to remain vacant through 2003.

The CSP accepted 'in principle' a request by Russia for an extension of the intermediate and final deadlines for destruction of its Category 1 CW.⁴⁹ The approval is contingent on a number of conditions reflecting the concern of the parties about the continued delay and uncertainty of the actual time frame for the destruction of Russia's CW stockpile.⁵⁰ The CSP also took a decision to improve implementation of CWC requirements on the declaration of the production, processing and consumption of Schedule 2 chemicals and on the transfer of Schedule 2 and 3 chemicals, which includes any activity by natural and legal persons transferring a declarable chemical between the territory of a state party and the territory of other states, including states not party to the CWC.⁵¹ The CWC requires that trade in certain chemicals be declared to the OPCW.⁵² These requirements are an essential part of its activities to provide a measure of confidence that significant quantities of Schedule 2 and Schedule 3 chemicals are not diverted for CW purposes and, thereby, to contribute to verification of the non-production of CW. Since the CWC's entry into force, however, less than half of the declared imports and exports of declarable chemicals have actually been matched. The mismatch is typically off by a factor of

ment C-7/DEC.4, 10 Oct. 2002. For treaty definitions of CW categories, destruction timelines and modification of intermediate destruction deadlines see CWC, Verification Annex, Part IV(A), paras 15–23. The definition of CW 'categories', which is partly based on the schedule in which a chemical is listed, is given in CWC, Verification Annex, Part IV(A), para. 16.

⁴⁷ OPCW, Decision, withholding the distribution of the prospective cash surplus for 2001, OPCW document C-7/DEC.17, 11 Oct. 2002.

⁴⁸ OPCW, 'Seventh Session of the Conference of the States Parties to the Chemical Weapons Convention concludes', Press Release 65/2002, 15 Oct. 2002.

⁴⁹ OPCW, Decision, request of the Russian Federation for an extension of the intermediate and final deadlines for the destruction of its Category 1 chemical weapons, OPCW document C-7/DEC.19, 11 Oct. 2002. Category 1 CW are defined as 'chemical weapons on the basis of Schedule 1 chemicals and their parts and components'. CWC, Verification Annex, Part IV(A), para. 16.

⁵⁰ The conditions include: periodic provision by Russia to the OPCW of information on the implementation of its CW destruction programme; periodic on-site visits to destruction facilities by experts from parties that are members of the OPCW Executive Council; the provision of periodic reports by the Director-General to the EC on the status of Russia's destruction programme; and Russia's acceptance of 31 Jan. 2003 as a 'benchmark target' date to start construction of a destruction facility at Kambarka and 1 Dec. 2003 as a benchmark target date to complete construction of the destruction facility and begin destruction operations.

⁵¹ OPCW, Decision, guidelines regarding declarations of aggregate national data for Schedule 2 chemical production, processing, consumption, import and export and Schedule 3 import and export, OPCW document C-7/DEC.14, 10 Oct. 2002. The CWC's Annex on Chemicals consists of 3 'schedules'. Schedule 1 chemicals consist of chemicals and their precursors judged to have few, if any, peaceful applications. Chemicals listed in schedules 2 and 3 have wider peaceful, including commercial, applications.

⁵² CWC, Verification Annex, part VII, paras 31–32, and part VIII, paras 26–27.

between 10 and 100.⁵³ This has been due in large part to the fact that the parties have employed different methods for collecting and declaring such information. The CSP's decision is partly designed to harmonize and streamline the declaration and processing of such information.

Destruction of chemical weapons

The declared possessors of CW are India, South Korea, Russia and the USA.⁵⁴ As of 28 February 2003, of 69 868.8 tonnes of CW agent declared, a total of 7 197.6 tonnes had been verifiably destroyed, and of 8 624 584 munitions and containers declared, 1 865 584 had been destroyed.⁵⁵ However, publicly available information on the destruction of the Indian and South Korean stockpiles is limited.

US CW destruction

As of 15 December 2002, 25.6 per cent of the USA's 31 279.7-tonne CW stockpile, as declared to the OPCW, had been destroyed.⁵⁶ The allocation for chemical demilitarization in the USA for fiscal year (FY) 2002 was \$1.105 billion.⁵⁷ The US CW are stockpiled at eight locations.⁵⁸ In 2002 destruction operations were carried out only at Tooele, Utah.⁵⁹ Construction of CW destruction facilities at three other sites was completed or near completion.⁶⁰ However, destruction operations did not begin in 2002, largely as a consequence of outstanding issues related to obtaining state and local legal permits for operating the facilities and resolution of lawsuits brought by opponents of incineration.⁶¹ A US National Academy of Sciences report char-

⁵³ Hart, J., *Chemical Industry Inspections Under the Chemical Weapons Convention*, Verification Matters, VERTIC (Verification, Research, Training and Information Centre), Research Report no. 1 (VERTIC: London, 2001) p. 21.

⁵⁴ As of 21 Feb. 2002, 61 CW production facilities had been declared by 11 parties: Bosnia and Herzegovina, China, France, India, Iran, Japan, South Korea, Russia, the UK, the USA and the former Yugoslavia (now Serbia and Montenegro). The CWC defines the facilities as any that produced CW at any time since 1 Jan. 1946. CWC, Article II, para. 8.

⁵⁵ OPCW official, Private communication with J. Hart, Mar. 2003.

⁵⁶ US Army Program Manager for Chemical Demilitarization, 'National chemical stockpile, distribution by storage location', Briefing slide, Jan. 2003. Types and quantities of the US CW stockpile are listed in Zanders, J. P., Eckstein, S. and Hart, J., 'Chemical and biological weapon developments', *SIPRI Yearbook 1997: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1997), pp. 449–51. For information on the US destruction programme see Zanders, Hart and Kuhlau (note 9), pp. 686–88; and Zanders, J. P. and Hart, J., 'Chemical and biological weapon developments and arms control', *SIPRI Yearbook 1998: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1998), pp. 461–63.

⁵⁷ Bowman, S. R., *Chemical Weapons Convention: Issues for Congress* (Congressional Research Service, Library of Congress: Washington, DC, 8 Jan. 2002), p. CRS-1.

⁵⁸ US CW are stockpiled at Aberdeen Proving Ground, Md.; Anniston Army Depot, Ala.; Lexington-Blue Grass, Ky.; Newport Army Ammunition Plant, Ind.; Pine Bluff Arsenal, Ark.; Pueblo Depot Activity, Colo.; Tooele Army Depot, Utah; and Umatilla Depot Activity, Ore. A former destruction facility at Johnston Atoll Depot, located in the South Pacific, is being dismantled.

⁵⁹ As of 15 Dec. 2002, 7567 agent tons (US tons) of the original 13 617 agent tons remained. US Army Program Manager for Chemical Demilitarization (note 56).

⁶⁰ The sites were Aberdeen, Anniston and Umatilla. Bowman (note 57).

⁶¹ Creamer, M., 'Governor sues to halt incineration, includes trial burns', Anniston Star.com, URL <<http://www.annistonstar.com/news/2002/as-calhoun-0215-mcreamer-2b14w3652.htm>>.

acterized incineration as the most technologically advanced destruction technology and indicated that the risks posed by storage probably outweigh those associated with using current incineration-based technology.⁶² Facilities based on the use of other technologies are currently under construction at two bulk chemical agent storage sites: Newport Army Ammunition Plant, Indiana, and Aberdeen Proving Ground, Maryland. The Johnston Atoll Chemical Agent Disposal System destruction facility, located south-west of Hawaii, continued to be dismantled.

Russian CW destruction

The declared Russian CW stockpile consists of approximately 40 000 agent tonnes and is stored at seven locations.⁶³ From the CWC's entry into force for Russia on 5 December 1997 to December 2002, Russia had conducted only limited destruction operations, essentially confined to Category 2 and 3 chemical weapons (i.e., weapons containing chemicals that are not listed in Schedule 1 and their parts and components, certain unfilled munitions and devices, and equipment).⁶⁴ On 19 December 2002 Russia began large-scale destruction operations at Gorny, where sulphur mustard, lewisite and mustard–lewisite mixtures are stored in bulk containers.⁶⁵ This marked the formal beginning of the destruction of Category 1 CW in Russia. The design and site preparation of the destruction facility at Shchuchye are ready, but construction of the facility was stalled in 2002 due to lack of funding on the part of both Russia and the USA.

The level of funding, as well as the extent to which foreign destruction assistance will or should facilitate destruction operations, continued to be a major factor affecting CW destruction in Russia, which is currently more than four years behind schedule.⁶⁶ For several years, it has been agreed in principle that the USA would fund the construction of the pilot destruction facility at Shchuchye. The USA provides CW destruction assistance to Russia within the framework of the 1991 Nunn–Lugar Cooperative Threat Reduction (CTR) programme and the 2002 Group of Eight (G8) Global Partnership Against the

⁶² National Research Council, *Evaluation of Chemical Events at Army Chemical Agent Disposal Facilities* (National Academies Press: Washington, DC, 2002), available at URL <<http://books.nap.edu/books/0309086299/html/index.html>>.

⁶³ The Russian CW storage locations are: Kambarka, Udmurtia Republic; Gorny, Saratov *oblast*; Kizner, Udmurtia Republic; Maradikovskiy, Kirov *oblast*; Pochep, Bryansk *oblast*; Leonidovka, Penza *oblast*; and Shchuchye, Kurgan *oblast*. For background on Russian CW destruction see Hart, J. and Miller, C. D. (eds), *Chemical Weapon Destruction in Russia: Political, Legal and Technical Aspects*, SIPRI Chemical & Biological Warfare Studies, no. 17 (Oxford University Press: Oxford, 1998). Information on the status of CW destruction in Russia, including foreign assistance, is provided by the Russian Munitions Agency, the body responsible for overseeing CW destruction in Russia and Russia's National Authority to the OPCW, at URL <<http://www.munition.gov.ru>>.

⁶⁴ On the destruction of category 2 and 3 CW in Russia, see Zanders, Hart and Kuhlau (note 9), p. 689.

⁶⁵ ITAR-TASS (Moscow), 17 Dec. 2002, in 'Russia begins elimination of chemical weapons stockpile', Foreign Broadcast Information Service, *Daily Report—Central Eurasia (FBIS-SOV)*, FBIS-SOV-2002-1217, 19 Dec. 2002. Germany has provided the bulk of external assistance for the destruction of the Gorny CW stockpile.

⁶⁶ On CW destruction assistance to Russia, including a list of donor countries, see Zanders, Hart and Kuhlau (note 9), pp. 691–93.

Spread of Weapons and Materials of Mass Destruction.⁶⁷ The US Congress allocated \$35 million for Shchuchye in 2002.⁶⁸ However, the money remained largely unspent because Russia did not fulfil congressionally mandated conditions, including the conditions that it should provide a more detailed inventory of its CW stockpile; allow short-notice inspections by the USA on the basis of the 1990 Soviet–US Bilateral Destruction Agreement (which was never ratified by either side); and provide greater financial transparency as regards the funding of its destruction programme.⁶⁹ On 10 January 2003, however, President George W. Bush signed a waiver releasing approximately \$450 million in CTR funding for nuclear, biological and chemical (NBC) disarmament projects, including funding for the construction of the Shchuchye destruction facility.⁷⁰ The estimated total US funding for chemical destruction assistance to Russia in FY 2003 is \$133.6 million.⁷¹ Other countries also provide destruction assistance to Russia.⁷² In 2002 a number of countries, including Canada⁷³ and Switzerland,⁷⁴ made new commitments worth several million dollars.

⁶⁷ US Department of State, ‘G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction’, Alan P. Larson, Under Secretary for Economic, Business and Agricultural Affairs, Testimony Before the House International Relations Committee, Washington, DC, 25 July 2002, URL <<http://www.state.gov/e/rls/rm/2002/12190.htm>>. See also chapter 14 in this volume.

⁶⁸ Interfax (Moscow), 4 Dec. 2002, in ‘Official says US terms for resuming Russian chemical arms financing unacceptable’, FBIS-SOV-2002-1204, 5 Dec. 2002.

⁶⁹ The USA and the USSR concluded two agreements on chemical weapons: the 1989 Memorandum of Understanding (MOU) and the 1990 Soviet–US Agreement on Destruction and Non-Production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons, which Russia argues has been superseded by the CWC. It is reproduced in *SIPRI Yearbook 1991: World Armaments and Disarmament* (Oxford University Press: Oxford, 1991), pp. 536–39. The USA would like to obtain additional information about the Soviet declarations made under the MOU and to implement the Bilateral Destruction Agreement, an action which is permissible under the CWC. CWC, Article IV, para. 13 and Article V, para. 16. The congressionally mandated conditions placed on CTR funding for chemical destruction assistance include a provision that infrastructure improvements unrelated to physical security not be funded and that US contractors receive contract awards. In turn, they may subcontract work to Russian entities. Other points of disagreement have related to financial transparency and whether and how any of the funds provided should be taxed. With respect to releasing funding for Shchuchye, the DOD must certify to Congress that Russia agrees to spend \$25 million each year on the construction and operation of the Shchuchye CW destruction facility, that Russia will use the CW destruction facility to destroy organophosphorus nerve agents located at 4 other stockpiles, that the USA has secured multi-year commitments from other countries to provide destruction assistance and that Russia will destroy CW production facilities located at Novocheboksarsk and Volgograd. Bowman (note 57), p. CRS-15; and Interfax (note 68).

⁷⁰ Surzhansky, A., ITAR-TASS (Moscow), 14 Jan. 2003, in ‘US President authorizes financing of Russian disarmament program’, FBIS-SOV-2003-01114, 15 Jan. 2002.

⁷¹ US Department of Defense, Defense budget materials FY 2003 budget, ‘Former Soviet Union (FSU) threat reduction’, Information sheet on CTR funding, 2002, URL <http://www.dod.mil/comptroller/fy2003budget/budget_justification/pdfs/operation/overview/13_FSU_Threat_Reduction.pdf>.

⁷² The countries include Canada, Finland, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland and the UK. At least part of the European assistance is provided within the EU framework.

⁷³ In Nov. it was announced that Canada would provide Russia with c. \$3.2 million worth of assistance. The funding is being provided within the framework of the G8’s Global Partnership Against the Spread of Weapons and Materials of Mass Destruction. Yurkin, A., Untitled article, ITAR-TASS (Moscow), 26 Nov. 2002, in ‘Canada helps Russia fund chemical weapons destruction’, FBIS-SOV-2002-1126, 27 Nov. 2002.

⁷⁴ ‘News chronology’, *CBW Conventions Bulletin*, no. 58 (Dec. 2002), p. 35.

Abandoned and old chemical weapons

As of 1 January 2003, three countries had declared that there are abandoned CW on their territories, and nine countries had declared that they possess old chemical weapons.⁷⁵

China and *Japan* continued their discussions on the destruction technologies to be employed to eliminate CW abandoned in China by Japan in the 1930s and 1940s and the number and location of destruction facilities.⁷⁶ They also carried out joint field activities, including partial excavation of burial sites and implementation of safety measures at known CW locations.⁷⁷ There is still no official agreement between the two countries on which destruction technologies will be used, although a decision is expected to be made in 2003.⁷⁸

On 23–25 January 2002, an OPCW team visited San José Island in *Panama*, where a number of recovered munitions were examined.⁷⁹ They included three intact An-M79 1000-pound bombs, a type and design known to have been used for filling with chemical agents and therefore possibly originally filled with an unidentified CW agent. The island was used by *the USA and its allies* for CW field testing during World War II. Although Panama has declared to the OPCW that it has abandoned CW on its territory, the identity of the abandoning state(s) has not been officially determined. Contacts between Panama and the USA on possible US treaty responsibilities continued.⁸⁰

A private study published by the Ministry of Defence of *Australia* surveyed past CW dumping by the Australian military and the US Army off the Australian coast, reportedly totalling some 14 634 tons⁸¹ dating from World War II and its aftermath.⁸² The report recommends greater public dissemination of information on dumping sites in order to prevent casualties from the accidental recovery of CW by fishing boats.

In *the USA* it is estimated that the clean-up operations of buried World War I-era CW at Spring Valley, in the north-west section of Washington, DC, will continue until at least mid-2007 and cost a further \$71.7 million.⁸³ The

⁷⁵ The countries that have declared old CW to the OPCW are Belgium, Canada, France, Germany, Italy, Japan, Slovenia, the UK and the USA. The countries that have declared abandoned CW to the OPCW are China, Italy and Panama. 'Old chemical weapons' are defined as CW produced before 1925 or CW produced between 1925 and 1946 that have deteriorated to such an extent that they can no longer be used as originally designed. CWC, Article II, para. 5. 'Abandoned chemical weapons' are defined as CW that have been abandoned by a state after 1 Jan. 1925 on the territory of another state without the permission of the latter. CWC, Article II, para. 6.

⁷⁶ Tregonning, F., 'Emerging from a trial by fire? The seventh session of the conference of the states parties', *Disarmament Diplomacy* no. 67 (Oct./Nov. 2002), p. 14.

⁷⁷ 'News chronology' (note 74), p. 33; and Baker, G., 'Experts begin chemical weapons dig', *Washington Post* (Internet edn), 5 Sep. 2002, URL <<http://www.washingtonpost.com>>.

⁷⁸ 'Statement by H. E. Mr. Hiroharu Koike, Ambassador of Japan to the Seventh Conference of the States Parties of the Organization for the Prohibition of Chemical Weapons', statement to the Seventh CSP, The Hague, Netherlands, 7 Oct. 2002.

⁷⁹ Panamanian Government official, Private communication with J. Hart, 6 Mar. 2002.

⁸⁰ Zanders, Hart and Kuhlau (note 9), p. 695.

⁸¹ The type of ton is not specified (i.e., long ton, short ton or metric tonne).

⁸² Plunkett, G., *Chemical Warfare Agent (CWA) Sea Dumping off Australia* (Australian Ministry of Defence: no city, 2002), available at URL <<http://www.hydro.gov.au/n2m/dumping/cwa/cwa.htm>>.

⁸³ Wood, D. G., *Environmental Contamination: Uncertainties Continue to Affect the Progress of the Spring Valley Cleanup*, Testimony before the Subcommittee on the District of Columbia, Committee on

exact extent of the work required and the possible future environmental and health effects are not known. Apparently on the basis of recently uncovered archival information, the area subject to assessment has been expanded to include nearby suburban areas in Maryland and Virginia.⁸⁴

Preparations for the First Review Conference of the CWC

The first CWC Review Conference, scheduled to convene on 28 April 2003, will 'take into account any relevant scientific and technological developments', as well as other matters that are judged to require the attention of the conference.⁸⁵ An OPCW open-ended working group on the First Review Conference, established in 2001, developed procedural rules for the conference and collected and produced supporting documentation.⁸⁶ The participants discussed agenda items in consultation with national governments, and independent institutes and analysts produced a number of background papers.⁸⁷

IV. Use of chemical and biological agents for law enforcement and non-lethal weapon purposes

The potential for applying technological and scientific results to produce materials, technologies and equipment to hinder, disable or incapacitate people for law enforcement or military purposes as well as to disable, destroy or damage infrastructure or equipment continues to grow.⁸⁸ A number of programmes involve the development of 'non-lethal' or 'less-than-lethal' chemical and biological substances for use in a range of situations that may not correspond with

Government Reform, House of Representatives, GAO-02-836T (US General Accounting Office: Washington, DC, 26 June 2002).

⁸⁴ Vogel, S., 'Arsenic inquiry expands to Md., N. Va.', *Washington Post* (Internet edn), 27 Apr. 2002, p. A01, URL <<http://www.washingtonpost.com>>; and Vogel, S., 'Carderock area eyed as WWI chemical test site', *Washington Post* (Internet edn), 21 Mar. 2002, p. B03, URL <<http://www.washingtonpost.com>>.

⁸⁵ CWC, Article VIII, para. 22.

⁸⁶ OPCW, 'Note by the Secretariat, attendance by non-governmental organizations at the First Review Conference', OPCW document WGRC-1/S/1, 28 Feb. 2002.

⁸⁷ Hart, J. *et al.*, 'Maintaining the effectiveness of the Chemical Weapons Convention', SIPRI Policy Paper, Oct. 2002, URL <http://projects.sipri.se/cbw/research/cwc_policypaper2.pdf>; International Union of Pure and Applied Chemistry (IUPAC), *Impact of Scientific Developments on the Chemical Weapons Convention*, Report by the International Union of Pure and Applied Chemistry to the Organization for [the] Prohibition of Chemical Weapons and its States Parties (IUPAC: Research Triangle Park, N.C., 2002); 'Impact of scientific developments on the Chemical Weapons Convention', Proceedings of IUPAC Workshop, Bergen, Norway, 30 June–3 July 2002, *Pure and Applied Chemistry*, vol. 74, no. 12 (12 Dec. 2002); Kenyon, I. R., 'The Chemical Weapons Convention and OPCW: the challenge of the 21st century', *CBW Conventions Bulletin*, no. 56 (June 2002), pp. 1–2; Perry Robinson, J., 'What should be the scope of the CWC?', *CBW Conventions Bulletin*, no. 55 (Mar. 2002), pp. 1–4; and Verification Research, Training and Information Centre (VERTIC), *Getting Verification Right: Proposals for Enhancing Implementation of the Chemical Weapons Convention* (VERTIC: London, 2002). An international appeal in support of the CWC was also launched. It is available at URL <<http://www.cwc-support.org/>>.

⁸⁸ Kokoski, R., 'Non-lethal weapons: a case study of new technology developments', *SIPRI Yearbook 1994* (Oxford University Press: Oxford, 1994), pp. 367–86; Dando, M., *A New Form of Warfare: The Rise of Non-Lethal Weapons* (Brassey's: London, 1996); and Jones, T. L., *Specialty Police Munitions* (Paladin Press: Boulder, Colo., 2000).

the traditional understanding of domestic riot control or warfare between states, including peacekeeping and anti-terrorism operations.⁸⁹ There is concern that even 'non-lethal weapons' can cause death through deliberate or inadvertent misuse,⁹⁰ and non-lethal weapons could be used to augment lethal weapon capabilities. In addition, non-lethal weapon programmes and related activities may contribute to blurring distinctions between prohibited and non-prohibited activities under the BTWC and the CWC which, in turn, could undermine treaty norms against CBW generally.⁹¹

In principle, the use of non-lethal technologies and equipment offers the potential to limit casualties and deaths among both those employing the technologies and equipment (e.g., peacekeeping personnel) and among those against whom they are used (e.g., rioters). The technologies and equipment vary greatly, both in terms of their state of development and the operational requirements for their optimal, safe and effective use. Non-lethal weapons may be based on a wide variety of physical principles and modes of application, including chemical or biological action. In order to consider the legal implications of their development and use the technologies and equipment need to be differentiated according to type and purpose.

In 2002 questions were raised as to whether certain activities and programmes might violate BTWC and CWC provisions or whether they are permissible activities conducted for 'law enforcement' purposes. This uncertainty was highlighted by Russia's use, in October 2002, of an aerosolized opiate derivative against approximately 50 Chechens, who had taken 750–800 hostages at the Dubrovka Theatrical Centre in Moscow.

Use of chemicals for law enforcement purposes

The Moscow incident began on 23 October and ended 56 hours later in the early morning hours of 26 October, when Russian special forces pumped what was initially described as 'sleeping' gas into the theatre about 30 minutes before their assault. The assault lasted about 15 minutes.⁹² The operation reportedly resulted in the deaths of 129 of the hostages. Two hostages were shot dead by the Chechens, while the others apparently died as a consequence of exposure to the chemical used.⁹³ Russian special forces killed all the hostage takers, some of whom were shot while incapacitated.⁹⁴

⁸⁹ Zanders and Hart (note 56), pp. 467–69. Such situations are sometimes called 'operations other than war' (OOTW).

⁹⁰ The misuse of any chemical may result in death. The threshold for allowable lethality, under proper use, of non-lethal weapons is generally no greater than 3%. If lethality exceeds this threshold, under proper use, the substance is generally not considered 'non-lethal'.

⁹¹ Wheelis, M., 'Biotechnology and chemical weapons control', *Pure and Applied Chemistry*, vol. 74, no. 12 (12 Dec. 2002), pp. 2247–51.

⁹² Khokhlov, A., 'Ofitser gruppy "Alfa": "My ne zatsepili ni odnogo zalozhnika"' [Alpha group officer: 'We did not clip a single hostage'], *Izvestiya* (Internet edn), 28 Oct. 2002, URL <<http://www.izvestia.ru>>.

⁹³ All the hostage takers were shot: some reportedly resisted, and some had been disabled by the gas.

⁹⁴ The operational doctrines of special forces generally specify conditions under which hostage takers are not to be taken prisoner because doing so may cause the mission to fail and/or result in deaths among

Russian authorities initially refused to disclose the identity of the chemical, even to medical staff, who were reportedly informed minutes before it was employed that an unnamed gas would be used.⁹⁵ They were instructed to administer naloxone, a drug used to treat opiate victims.

In response to a request for clarification by the OPCW on the type of chemical used, the Russian Minister of Health stated that it was an aerosolized opiate based on fentanyl.⁹⁶ Toxicological analyses of samples taken from non-Russian hostages, who had returned home, suggested that at least one other compound was present.⁹⁷ The chemical was subsequently described as an aerosolized form of carfentanil or etorphine, drugs normally used to sedate big game animals.⁹⁸ Perhaps referring to the chemical's therapeutic index (also known as the relative safety index),⁹⁹ a Federal Security Service spokesman said that there had been 'consensus among the experts we consulted that this drug could not have caused death'.¹⁰⁰

Relationship to the CWC

In determining whether the action of the Russian forces at the theatre was permissible under the CWC, it is necessary to consider how the convention treats toxic chemicals and their precursors, including its definition of a 'chemical weapon' and the permitted uses of chemicals for 'law enforcement' purposes.¹⁰¹ The CWC defines a chemical weapon as:

the hostages or special forces. The circumstances, including the time frame, surrounding the deaths of the Chechen hostage takers are unclear.

⁹⁵ The evacuation was criticized for being poorly planned and executed, thereby contributing to unnecessary deaths. The hostages, groggy or unconscious, were carried out to waiting ambulances, a process that took up to 1.5 hour to complete. An unknown number of victims died because medical staff were unable to immediately diagnose the symptoms or give the prescribed medical treatment and because relevant medicinal stocks were not on hand. Some of the deaths may have been partly due to the weakened condition of the hostages, who had eaten little, if anything, during the siege and been under stress. A number of the hostages vomited and apparently choked to death while unconscious. Bateneva, T., 'Lyudi gibli ne ot gaza, a ot stressa' [People died not from gas, but from stress], *Izvestiya* (Internet edn), 28 Oct. 2002, URL <<http://www.izvestia.ru/>>; and Borisova, Y., 'The gas saved them, the gas killed them', *Moscow Times.com*, 28 Oct. 2002, p. 3, URL <<http://www.themoscowtimes.com/>>.

⁹⁶ Ember, L., 'Opiate ends hostage crisis', *Chemical & Engineering News*, vol. 80, no. 44 (4 Nov. 2002), p. 6.

⁹⁷ Enserink, M. and Stone, R., 'Questions swirl over knockout gas used in hostage crisis', *Science*, vol. 298, no. 5596 (8 Nov. 2002), pp. 1150–51. Samples taken from the bodies and clothing of Western hostages were reportedly tested in Germany and the UK. 'BBC Radio 4 interview with UK Foreign Secretary Jack Straw', 30 Oct. 2002, URL <<http://www.fco.gov.uk/>>; and Ingram, J., 'Health minister says gas was opiate', *Moscow Times.com*, 31 Oct. 2002, p. 1, URL <<http://www.themoscowtimes.com/>>.

⁹⁸ Brown, D. and Baker, P., 'Moscow gas likely a potent narcotic drug normally used to subdue big game', *Washington Post* (Internet edn), 9 Nov. 2002, p. A12, URL <<http://www.washingtonpost.com/>>; and Enserink and Stone (note 97).

⁹⁹ The therapeutic index is the ratio of the agent's lethal dose to its effective dose.

¹⁰⁰ Brown and Baker (note 98). Carfentanil, which is some 100 times more potent than fentanyl, has a therapeutic index of 10 000 in rats. Chemical and Biological Weapons Nonproliferation Program, Monterey Institute of International Studies' Center for Nonproliferation Studies, 'The Moscow theater hostage crisis: incapacitants and chemical warfare', Monterey Institute Fact Sheet, 4 Nov. 2002, URL <<http://www.cns.miis.edu/>>.

¹⁰¹ "'Law enforcement" and the CWC', *CBW Conventions Bulletin* (note 74), pp. 1–2.

the following, together or separately: (a) Toxic chemicals and their precursors, except where intended for purposes not prohibited under this Convention, as long as the types and quantities are consistent with such purposes; (b) Munitions and devices, specifically designed to cause death or other harm through the toxic properties of those toxic chemicals specified in subparagraph (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 munitions and devices specified in subparagraph (b).¹⁰²

The definition includes a ‘general purpose criterion’ (GPC), which bans the production, retention or use of all toxic chemicals except for non-prohibited purposes.¹⁰³ However, the CWC does not define ‘law enforcement’ except for riot control agents (RCAs).¹⁰⁴ With the exception of RCAs, the CWC also does not specify whether the chemicals used for law enforcement purposes are permitted to have short-term or long-term effects or whether they may be ‘lethal’. In practice, however, it is understood that the use of toxic chemicals for law enforcement purposes may include their use for judicial executions. The opinion was widely held among the negotiators of the CWC that it would be difficult, if not impossible, to define law enforcement purposes. This was apparently partly due to concerns that the convention not restrict or ban the use of toxic chemicals for judicial executions and partly because of the difficulties in defining and categorizing policing operations.

The principal CWC provisions regarding chemicals that may be used for law enforcement purposes are: (a) that the ‘types and quantities are consistent with such purposes’,¹⁰⁵ (b) that such chemicals are not to be used in a manner ‘dependent on the toxic properties of chemicals as a method of warfare’,¹⁰⁶ and (c) that such chemicals do not appear on Schedule 1 of the CWC Annex on Chemicals.¹⁰⁷ There is no requirement for the CWC parties to declare chemicals for law enforcement purposes unless they are classified as RCA for ‘domestic riot control’. In such cases, the parties must declare to the OPCW

¹⁰² CWC, Article II, para. 1.

¹⁰³ CWC, Article II, para. 1(a).

¹⁰⁴ CWC, Article II, para. 9(d) lists as purposes not prohibited by the CWC: ‘Law enforcement including domestic riot control purposes’. RCAs must be a chemical that ‘can produce rapidly in humans sensory irritation or disabling physical effects which disappear within a short time following termination of exposure’. RCAs may not be chemicals listed in the CWC Annex on Chemicals. CWC, Article II, para. 7.

¹⁰⁵ Note 103.

¹⁰⁶ CWC, Article II, para. 9(c). The text is from the definition of ‘purposes not prohibited’. It has been argued that para. 9(c) applies to the use of conventional munitions only. Otherwise, nearly any munition could be termed ‘CW’, including TNT, smoke munitions and napalm. All are dependent on chemical reactions and are, to varying degrees, toxic. In order to take these factors into account (dependence of conventional munitions on chemical reactions and varying levels of associated toxicity), para. 9(c) specifies that the weapon must be ‘dependent on the toxic properties of chemicals’ in order for it to fall under CWC prohibitions. Emphasis added.

¹⁰⁷ CWC, Part VI of the Verification Annex, para. 2. This paragraph lists permitted purposes for Schedule 1 chemicals. Law enforcement is not included in the list. Schedule 1 contains chemicals and their precursors deemed to pose the highest risk to the object and purpose of the convention. Most Schedule 1 chemicals have been used or are suitable for use as chemical weapons (or are direct precursors of such chemicals) and have few peaceful purposes relative to chemicals listed in Schedule 2 and Schedule 3.

the names and structural formulae of the chemicals, but not their quantities or location.¹⁰⁸

The use of a chemical in the Moscow theatre was for law enforcement purposes and was not, strictly speaking, a CWC violation. There is concern in some quarters that, as a result of the relatively high number of, albeit unintentional, deaths the convention's basic prohibition against CW may have been undermined—irrespective of the user's purpose or intention. The use of a chemical in the Moscow theatre also raises questions similar to those raised by non-lethal weapon programmes, mainly relating to how convention provisions can or should be interpreted and implemented.

Use of chemical and biological agents as non-lethal weapons

The USA and a number of other countries are pursuing non-lethal weapon projects.¹⁰⁹ The Department of Defense (DOD) has defined non-lethal weapons as 'weapons that are explicitly designed and primarily employed so as to incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment'.¹¹⁰ These weapons have also been characterized as systems that 'when properly applied, can stop the undesirable action of an individual and induce compliance by means that have a low probability of producing lethal effects'.¹¹¹ US non-lethal weapon activities are currently coordinated by the DOD Joint Non-Lethal Weapons Program (JNLWP), which is overseen by the US Marine Corps.¹¹² Its activities are broadly designed 'to minimize fatalities, while expanding the range of options to commanders'.¹¹³

The Department of Justice is involved in the development and acquisition of non-lethal weapons for local, regional and federal law enforcement purposes.¹¹⁴ The capabilities being sought in the chemical and biological field include anti-traction materials (for use against vehicles), calmatives,¹¹⁵ depolymerizers and malodorants.¹¹⁶ The solution to a number of associated technical challenges can be applied to both offensive and defensive BW or CW pro-

¹⁰⁸ CWC, Article III, para. 1(e).

¹⁰⁹ Select JNLWP documents are available at 'US "non lethal" chemical and biochemical weapons research: a collection of documents detailing a dangerous program', URL <<http://www.sunshine-project.org/>>.

¹¹⁰ US Department of Defense, Directive subject: policy for non-lethal weapons, DODD 3000.3, Washington, DC, 9 July 1996, p. 2, quoted in National Research Council, *An Assessment of Non-Lethal Weapons Science and Technology* (draft) (National Academies Press: Washington, DC, 2002), p. 1-1.

¹¹¹ Jones, T. L., *Specialty Police Munitions* (Paladin Press: Boulder, Colo., 2000), p. 1.

¹¹² The JNLWP's Internet site is URL <<http://www.jnlwd.usmc.mil/>>.

¹¹³ 'Legal review of oleoresin capsicum (OC) pepper spray', Memo by US Deputy Assistant Judge Advocate General (International and Operational Law Division) to Commander, US Marine Corps System Command, Ser 103/353, 19 May 1998, p. 7, available at URL <<http://www.sunshine-project.org/>>.

¹¹⁴ On the Justice Technology Information Network see URL <<http://www.nlectc.org/>>.

¹¹⁵ Lakoski, J. M., Murray, W. B. and Kenny, J. M., *The Advantages and Limitations of Calmatives for Use as a Non-Lethal Technique* (Pennsylvania State University: State College, Pa., 3 Oct. 2000), available at URL <<http://www.sunshine-project.org/>>.

¹¹⁶ Science Applications International Corporation (SAIC), *Less-Than-Lethal Systems: Situational Control by Olfactory Stimuli* (SAIC: San Diego, Calif., June 1998), White Paper submitted to Joint Non-Lethal Directorate, available at URL <<http://www.sunshine-project.org/>>.

grammes—including the development of new and more effective micro-encapsulation techniques and frangible munition casings capable of delivering relatively fragile chemical and biological substances reliably and safely. Policy and legal reviews have been carried out in parallel, and areas where legal interpretations differ have been identified.¹¹⁷ Views differ on which areas, if any, violate international treaties or national laws.

One project that has been pointed to as possibly violating the CWC is the effort to develop the Overhead Liquid Dispersion System. It consists of a specially designed fuse, dispersal and launch system to disperse a non-lethal liquid—such as a malodorant, tear gas or marking agent—from a distance of approximately 100–135 metres, giving a maximum dispersion pattern with optimal droplet size and minimal debris size and mass.¹¹⁸ Military forces may be able to use the system when confronted by agitated crowds in order to avoid the use of lethal force.

CWC implementation

Since the CWC entered into force, relatively little attention has been given to the use of chemicals for law enforcement. The major related issue has been how adamsite, an unscheduled chemical that has been stockpiled for use as both a CW and an RCA, should be declared.¹¹⁹ Some parties have declared it as an RCA, while other parties have declared it as a CW. Non-scheduled toxic chemicals held for non-RCA, law enforcement purposes do not have to be declared, and no voluntary declarations of this nature appear to have been made to the OPCW. (Only some of the information contained in the declarations to the OPCW is publicly available.) In addition, the CWC does not clearly specify that an RCA can only be used for domestic riot control purposes. In principle, an RCA may be stockpiled for other purposes and therefore not be declared.

Under the CWC unfilled delivery systems which are not specifically designed to be used to deliver a CW are not considered to be a chemical weapon and therefore do not have to be declared. Thus any munition or device that is to be used either as part of a CW or as part of a conventional weapon (e.g., an unfilled mortar shell capable of carrying both chemical and conventional high-explosive fill) is not banned under the CWC. In addition, the CWC has been implemented using the criterion that, if there is no evidence clearly indicating that an empty item's original purpose was for use as a CW, it is not considered as a chemical weapon.¹²⁰

¹¹⁷ 'Legal review of oleoresin capsicum (OC) pepper spray' (note 113).

¹¹⁸ PRIMEX Aerospace Company, *Overhead Liquid Dispersion System (OLDS), Non-Lethal Demonstration Program, Final Report* (PRIMEX Aerospace Company: Redmond, Wash., 19 Apr. 2000), Report no. DAAE30-99-C-1072, p. 6, available at URL <<http://www.sunshine-project.org/>>.

¹¹⁹ The agent is ill-suited for either purpose: it is too toxic for use as an RCA and not sufficiently toxic for use as a CW.

¹²⁰ OPCW official, Private communication with J. Hart, Jan. 2003. This interpretation is not shared by everyone involved in implementing the CWC.

Implications

Differences exist in the understanding of how convention provisions should be implemented in theory and how they are or should be applied in practice. In general, a treaty may be interpreted 'to the letter' or in accordance with the parties' understanding of its broader purposes (i.e., the 'spirit' of the treaty). Those who favour interpreting CWC provisions to the letter often try to interpret convention language literally to the extent that the rationale behind the provision may be forgotten or ignored. Those who interpret the provisions of the CWC more in accordance with their conception of its spirit will probably emphasize the importance of the intention of the negotiators who drafted the provisions and may refer to the CWC's basic prohibitions against CW (Article I) in order to clarify possible ambiguities in other areas of the convention text.

These two approaches have implications in terms of whether the convention should be implemented on the basis of explicit policy decisions or become codified as a result of implementation practice.¹²¹ If there is an absence of clear policy guidance in OPCW decisions, there is a risk that the GPC's effectiveness may be undermined as a result of implementation practice that is based on a narrow or 'reductionist' interpretation of convention provisions.

Parties may possess undeclared toxic chemicals for law enforcement purposes that meet the definition of an RCA but which are not intended for domestic riot control. Chemicals designated for law enforcement purposes, including RCAs, may not be used as a 'method of warfare'.¹²² Concern could be caused by a situation in which CWC parties develop and stockpile toxic chemicals and formulate doctrines for their use by military or police personnel yet do not declare the chemicals because that they are for law enforcement purposes. A state may therefore be able to stockpile toxic chemicals that are not listed in Schedule 1 and associated delivery systems which could be used for prohibited purposes immediately or shortly after a decision to withdraw from the CWC.

¹²¹ The 2 approaches are illustrated by the question of whether large quantities of toxic chemicals, filled into munitions for law enforcement purposes, meet the 'types and quantities for peaceful purposes' criterion contained in the CWC definition of a CW. CWC, Article II, para. 1(a). Those who interpret the CWC in accordance with their understanding of its 'spirit' tend to argue that the burden of proof for demonstrating that the GPC is being met lies with the state party (i.e., that it is unlikely that a party could convincingly demonstrate or prove that large numbers of 122-mm artillery shells filled with tear gas meet the 'types and quantities for peaceful purposes' criterion). If one accepts that peacekeeping operations are a form of law enforcement and thus may involve the use of filled munitions which may be fired using mortars or even artillery, then the type of munition into which the toxic chemical is loaded may be irrelevant. If so, *intent* and *misuse* of toxic chemicals become the key issues in determining whether the munition, the toxic chemical and the manner in which they are used are permissible under the CWC. Those who take this approach argue that, with the former approach, there is a danger that meaning may improperly be read into convention provisions which, in turn, may increase the possibility for confusion and open-ended discussions on parties' specific responsibilities and implementation requirements at the operational level. There is thus significant scope for disagreement on convention implementation based, in part, on differences in legal interpretation and in underlying philosophical and methodological assumptions by those involved.

¹²² The CWC bans the use of RCAs as 'a method of warfare'. CWC, Article I, para. 5. 'Method of warfare' does not necessarily exclude the possibility that the chemicals may be used for 'military purposes'. The latter term can be understood to include 'peacekeeping' or 'peace enforcement' operations.

Many scenarios are possible that involve the use of non-lethal weapons generally and those covered by the BTWC and the CWC specifically. In the context of the CWC, the two principal considerations in determining the legality of using chemical or biological substances for law enforcement are purpose and whether those employing the substances have the legal mandate or authority to use them for such a purpose. Other legal instruments may apply when considering, for example, whether and the extent to which the intention of not causing harm absolves the user of legal responsibility for deaths that may occur. This may also be true as regards enhancing the ability of law enforcement personnel to kill with other weapons (e.g., firearms) and the circumstances under which peace enforcement or anti-terrorist operations can or should be considered as 'law enforcement'.

V. Disarmament of Iraq

After the 1991 Persian Gulf War UN Security Council Resolution 687 established UNSCOM to oversee the elimination of Iraq's CBW and ballistic missiles with a range of more than 150 km.¹²³ The International Atomic Energy Agency (IAEA) was mandated to verify nuclear disarmament in Iraq. In December 1998 UNSCOM was forced to withdraw its inspectors, leaving unanswered questions about Iraq's weapon holdings and capabilities. The unresolved issues were partly due to persistent Iraqi obstruction and partly to rapidly widening differences in the Security Council over sanctions against Iraq and future disarmament measures.¹²⁴ In December 1999 UNSCOM was replaced by UNMOVIC, which was established by UN Security Council Resolution 1284.¹²⁵

In 2002 the USA, by threatening military action against Iraq, pressured the UN to enforce UN Security Council resolutions.¹²⁶ To support the call for further action to resolve the question of Iraq's compliance with the relevant resolutions, several official and semi-official assessments of its NBC and missile capabilities and programmes were published.¹²⁷ Following widespread international efforts to secure Iraq's acceptance of international weapon inspectors, in September the Iraqi Government agreed to allow their return

¹²³ UN Security Council Resolution 687, 3 Apr. 1991.

¹²⁴ Wahlberg, M., Leitenberg, M. and Zanders, J. P., 'The future of chemical and biological weapons disarmament in Iraq: from UNSCOM to UNMOVIC', *SIPRI Yearbook 2000: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2000), pp. 570–74.

¹²⁵ UN Security Council Resolution 1284, 17 Dec. 1999. See also chapter 1 in this volume.

¹²⁶ White House 'President's remarks at the United Nations General Assembly', Press Release, 12 Sep. 2002, URL <<http://www.whitehouse.gov/news/releases/2002/09/20020912-1.html>>; and White House, 'President Bush outlines Iraqi threat', Press Release, 7 Oct. 2002, URL <<http://www.whitehouse.gov/news/releases/2002/10/2002/10007-8.html>>.

¹²⁷ International Institute for Strategic Studies (IISS), *Iraq's Weapons of Mass Destruction: a Net Assessment* (IISS: London, 9 Sep. 2002); 'President's remarks at the United Nations General Assembly' (note 126); British Government, *Iraq's Weapons of Mass Destruction: the Assessment of the British Government* (Stationery Office Limited: London, 24 Sep. 2002), available at URL <<http://www.official-documents.co.uk/document/reps/iraq/iraqdossier.pdf>>; and US Central Intelligence Agency, *Iraq's Weapons of Mass Destruction Programs*, URL <http://www.cia.gov/cia/publications/iraq_wmd/Iraq_Oct_2002.htm>.

without conditions.¹²⁸ On 8 November the UN Security Council unanimously adopted Resolution 1441, which reaffirmed Iraq's obligation to comply with Security Council resolutions and provided for the reintroduction of international inspectors into Iraq.¹²⁹

UNMOVIC was granted full access to all the sites that it had asked to inspect. However, a distinction was made by UNMOVIC Executive Chairman Hans Blix between Iraqi compliance on 'substance' and 'process'. For example, the USA, the UK and other states complained that Iraqi scientists and technical experts were not sufficiently cooperative or forthcoming with information. The inspections were unique in that they were carried out against a background of blunt public statements by the USA and the UK in which they threatened military action against Iraq if it did not fully cooperate with the UNMOVIC inspectors. This was accompanied by a military build-up in the region by the USA and some of its allies.

The UNMOVIC mandate under Resolution 1441

UN Security Council Resolution 1441 deplored the fact that Iraq had not provided 'an accurate, full, final, and complete disclosure' of 'all aspects' of its NBC and missile programmes as required by Security Council Resolution 687. It stated that Iraq had been and remained in 'material breach' of its UN obligations and had failed to 'cooperate fully and unconditionally' with international weapon inspectors.¹³⁰ It also stated that Iraq had 'repeatedly obstructed immediate, unconditional, and unrestricted access' to sites designated by UNSCOM and the IAEA. Resolution 1441 specified the rights and privileges of the IAEA and UNMOVIC, including the right of inspectors to 'freeze' access to sites and to remove equipment, materials or documents without being searched by Iraqi authorities. These specifications expanded or clarified the rights and powers afforded to inspectors and effectively eliminated the restrictions contained in the 1998 Memorandum of Understanding (MOU) between the UN and Iraq, which limited inspector access at the so-called presidential sites.¹³¹ Resolution 1441 afforded Iraq a 'final opportunity' to comply with its disarmament obligations. It stated that interference by Iraq with inspection activities or failure to comply with disarmament obligations were to be reported immediately to the UN Security Council. The resolution recalled past Security Council warnings that Iraq's failure to comply would result in 'serious consequences'—understood to include military action.¹³²

¹²⁸ Letter dated 16 September 2002 from the Secretary-General addressed to the President of the Security Council, UN document S/2002/1034, 17 Sep. 2002, URL <<http://www.un.org/Depts/unmovic/chronology/1034.pdf>>.

¹²⁹ UN Security Council Resolution 1441, 8 Nov. 2002, para. 13.

¹³⁰ The elements that would constitute a material breach (false statements and failure to comply), together or separately (depending on interpretation) provide the basis for determining whether 'serious consequences' will take place.

¹³¹ Memorandum of Understanding between the United Nations and the Republic of Iraq, 23 Feb. 1998, URL <<http://www.un.org/NewLinks/uniraq.htm>>.

¹³² Some Security Council members held the view that military action was only one of a number of the possible 'serious consequences'.

UN Security Council resolutions 687, 1284 and 1441 fall under Chapter VII of the UN Charter, which allows the use of military intervention to maintain or restore international peace and security.¹³³ Resolution 1441's robust language and unanimous adoption by the Security Council gave UNMOVIC a stronger and more extensive mandate than Resolution 1284 had done. In order to comply with Resolution 1441 Iraq was required to submit a 'currently accurate, full, and complete declaration of all aspects' of its weapon and missile programmes within 30 days (paragraph 3). The resolution provided UNMOVIC with strong political support and limited the opportunities for Iraq to negotiate terms of access or otherwise hinder inspections. UNMOVIC had to re-establish a baseline of information. This was achieved primarily by systematically re-inspecting sites that had previously been inspected by UNSCOM. UNMOVIC also had to address outstanding questions from the period when UNSCOM inspectors left Iraq in late 1998. Some additional information was provided by Iraq. However, questions remained about Iraq's compliance.

UNMOVIC was given the same formal powers and responsibilities as UNSCOM had been given in Resolution 1284 (paragraph 1). Both UNSCOM and UNMOVIC were mandated to carry out ongoing monitoring and verification (OMV) of Iraq as stipulated in Resolution 687 and subsequently detailed in Resolution 715.¹³⁴ In Resolution 1284 the inspection, disposal and long-term monitoring phase are integrated in an OMV system, which was also put in place under Resolution 1441.¹³⁵ Resolution 1441 restored the principle of full, unconditional access to any and all sites, which had been undermined by, among other things, the 1998 MOU.¹³⁶ The MOU modalities were retained in Resolution 1284. Resolution 1441 also gave UNMOVIC the authority to 'freeze' sites and block movement to and from inspected areas (paragraphs 5 and 7). This provision was included in order to avoid the experience of the IAEA and UNSCOM in which inspectors were sometimes prevented from entering a site or were not given the requested access.¹³⁷

Another important expansion of authority in Resolution 1441 was a provision allowing UNMOVIC to interview Iraqi scientists, both in Iraq and abroad, and offer asylum to them and their families in exchange for information (paragraph 5). Iraq was obligated to provide a list of scientists associated with prohibited weapon programmes (paragraph 7). Although a partial list was provided, the authority to conduct interviews abroad was not exercised, despite pressure from the USA and other states to do so. The reasons given included the reluctance of UNMOVIC to carry out such measures before prac-

¹³³ UN, Charter of the UN, 'Chapter VII, Action with respect to threats to peace, breaches of peace, and acts of aggression', URL <<http://www.un.org/Overview/Charter/chapter7.html>>.

¹³⁴ See also UN Security Council Resolution 715, 11 Oct. 1991, adopted as requested in UN Security Council Resolution 687 to develop plans for ongoing monitoring and verification.

¹³⁵ Cortright, D. *et al.*, Sanctions and Security Project of the Fourth Freedom Forum, Joan B. Kroc Institute for International Peace Studies and University of Notre Dame, 'UN weapons inspections in Iraq: a progress report', 23 Jan. 2003, URL <http://www.nd.edu/~krocinst/research/inspections_report.pdf>. For information on OMV see Wahlberg, Leitenberg and Zanders (note 124), pp. 560–75.

¹³⁶ Memorandum of Understanding (note 131).

¹³⁷ 'Flashback: inspecting Iraq', BBC News Online, 18 Nov. 2002, URL <http://news.bbc.co.uk/2/hi/middle_east/2489153.stm>.

tical arrangements had been implemented. In addition, individuals could not be forced to travel abroad or to defect.¹³⁸ Although an agreement was reached with Iraqi authorities to allow and encourage UNMOVIC and the IAEA to conduct private interviews in Iraq with key scientists and technical experts,¹³⁹ most of them refused to speak without an Iraqi official present.¹⁴⁰

In order to address past Iraqi allegations of espionage by UNSCOM inspectors, Resolution 1441 addressed intelligence sharing and information flow (paragraph 10). Individual governments could provide information to UNMOVIC, but it could not be communicated back to governments.¹⁴¹ Unlike UNSCOM staff, UNMOVIC personnel are UN employees and as such may not represent the interests of individual governments.¹⁴² Security Council resolutions 1284 (paragraph 10) and 1441 (paragraph 10) requested states to cooperate with and fully support the implementation of the mandate by providing relevant information (e.g., intelligence). In practice, not all states with intelligence capabilities were completely forthcoming with information. For example, while the USA provided some intelligence information to UNMOVIC, it apparently withheld other sensitive data despite requests by the IAEA and UNMOVIC for additional, relevant information in order to better evaluate US assertions regarding Iraq's weapon programmes.¹⁴³ There were also different expectations by states, UNMOVIC and the IAEA concerning the types of intelligence data that should be provided and how to act on such data.

The reporting processes under resolutions 1284 and 1441 are parallel, with separate timetables for the submission of formal reports. Reports under Resolution 1284 are submitted to the Security Council via the Secretary-General's office (paragraph 12). Resolution 1441 required UNMOVIC to report directly to the Security Council, eliminating the opportunity for Iraq to negotiate compromises with departments or individuals outside the Security Council (paragraphs 10 and 11).¹⁴⁴

The inspectors were put under intense time pressure by several members of the UN Security Council to verify Iraq's statements regarding its weapon capabilities. It was unclear how much time might be required to uncover evidence of the status of Iraq's CBW programmes. The situation was complicated by the fact that four years had elapsed since the previous inspections; the evidence being sought might no longer exist. UNMOVIC would need to combine

¹³⁸ UN Headquarters, Press Briefing; Hans Blix, Executive Chairman of UNMOVIC and Mohamed ElBaradei, Director General of IAEA (unofficial transcript), 9 Jan. 2003, URL <<http://www.iaea.or.at/worldatom/Press/Focus/laeaIraq/>>.

¹³⁹ UN News Centre, 'Agreed statement following two days of talks between UNMOVIC/IAEA delegation and the Iraqi delegation in Baghdad', 20 Jan. 2003, URL <<http://www.un.org/apps/news/infocusnewsiraq.asp?NewsID=341&sID=8>>.

¹⁴⁰ UN Security Council, 'An update on inspection', statement by Executive Chairman of UNMOVIC, Hans Blix, 27 Jan. 2003, URL <<http://www.un.org/Depts/unmovic/Bx27.htm>>.

¹⁴¹ UNMOVIC official, Private communication with F. Kuhlau, Jan. 2003.

¹⁴² UNMOVIC, 'UNMOVIC basic facts', URL <<http://www.un.org/Depts/unmovic/>>.

¹⁴³ US Department of State, 'US gives UN inspectors evidence of Iraqi weapons programs: State's Reeker says US is sharing intelligence with UNMOVIC', 31 Dec. 2002, URL <<http://usinfo.state.gov/regional/nea/iraq/text/1231un.htm>>.

¹⁴⁴ UNMOVIC official (note 141); and Wahlberg, Leitenberg and Zanders (note 124), p. 569.

old and new data in order to obtain a comprehensive overview of the status of Iraq's compliance.¹⁴⁵

Inspections conducted under Resolution 1441

The first inspection under Resolution 1441 was conducted on 27 November 2002;¹⁴⁶ as of 27 January 2003, 97 UNMOVIC inspectors had carried out approximately 300 inspections at more than 230 sites.¹⁴⁷ Initially, UNMOVIC focused its inspections on sites formerly inspected by UNSCOM, and it experienced operational difficulties in moving equipment and personnel into the field. UNMOVIC had to allocate a large number of personnel in a short period of time to cover several Iraqi sites simultaneously, and numerous contracts for equipment and services had to be signed.¹⁴⁸ In addition, UNMOVIC had not stockpiled large amounts of equipment because it was not known when or if inspectors would return to Iraq. These factors contributed to the logistical and operational difficulties in the initial phase of UNMOVIC operations.¹⁴⁹ Mobility was hindered and aerial inspections and monitoring could not be conducted until January 2003, when UN member states provided helicopters for the use of UNMOVIC.¹⁵⁰

Cooperation and confidence building

Iraq cooperated in terms of procedure ('process') by providing access to all the requested sites, but its active ('substance') cooperation was inadequate.¹⁵¹ Iraq submitted a 12 000-page declaration on 7 December 2002, which stated that it no longer possessed banned weapons but provided little additional substantive information on past programmes and activities.¹⁵² Questions were not resolved about banned weapon programmes (e.g., those involving VX, anthrax and chemical and biological munitions).¹⁵³ These issues were among those still in doubt when UNMOVIC presented its report to the Security Council on

¹⁴⁵ Global Security Newswire, 'Iraq I: so far, Baghdad's compliance "very limited", Blix says', 28 Feb. 2003, URL <http://www.nti.org/d_newswire/issues/2003/2/28/2s.html>.

¹⁴⁶ UNMOVIC/IAEA, 'Press Statement on Inspection Activities in Iraq', 27 Nov. 2002, URL <http://www.iaea.org/worldatom/Press/P_release/2002/med-advise_057.shtml>.

¹⁴⁷ UNMOVIC official (note 141). As of 25 Jan. 2003 a total of 256 persons worked for UNMOVIC and the IAEA in Iraq. The total number of inspectors was 108: 97 from UNMOVIC and 11 from IAEA. The rest were support staff.

¹⁴⁸ Blix, H., 'Briefing to the United Nations Security Council', 19 Dec. 2002, URL <<http://www.un.org/Depts/unmovic/recent%20items.html>>.

¹⁴⁹ Brookings Institution, 'Iraq's declaration on weapons of mass destruction', Press Briefing, 12 Dec. 2002, p. 5, URL <<http://www.brook.edu/comm/events/20021212.htm>>.

¹⁵⁰ 'Disarming Iraq: UNMOVIC and IAEA Press statement on inspection activities in Iraq', 7 Jan. 2003, URL <<http://www.un.org/apps/news/infocusnewsiraq.asp?NewsID=323&sID=8>>.

¹⁵¹ UN Security Council (note 140).

¹⁵² UNMOVIC official (note 141).

¹⁵³ Blix, H., 'Notes for briefing the Security Council', 9 Jan. 2003, URL <<http://www.un.org/Depts/unmovic/recent%20items.html>>; US Department of State, 'State Department cites gaps in Iraq weapons declaration: fact sheet calls missing information "material omissions"', 19 Dec. 2002, URL <<http://usinfo.state.gov/regional/nea/iraq/text/1219fact.htm>>; and Wahlberg, Leitenberg and Zanders (note 124), pp. 560–75.

27 January 2003, 60 days after inspections had resumed. Other issues included: a discrepancy of 6500 chemical bombs filled with approximately 1000 tonnes of chemical agent; lack of credible evidence to support Iraq's claim that it had unilaterally destroyed 8500 litres of anthrax; and failure to explain aspects of its VX production programme. Iraq also did not declare all quantities of imported growth media—which according to the UNMOVIC report would suffice to produce about 5000 litres of concentrated anthrax.¹⁵⁴ Missiles and shells that exceed the allowed range and diameter limits were also discovered.¹⁵⁵

Altering the sanctions regime

The 'oil-for-food' programme, created under UN Security Council Resolution 986,¹⁵⁶ was modified by Resolution 1409, which established a Goods Review List (GRL) consisting of several categories of dual-use commodities and products.¹⁵⁷ Resolution 1409 was designed to implement a system of 'smart sanctions' by ensuring rapid and unimpeded flow of civilian goods while maintaining critical controls on 'militarily useful' items.¹⁵⁸ Previously, all requests were cleared by a committee established by Security Council Resolution 661 (the '661 Committee').¹⁵⁹ Under the revised procedures, the IAEA and UNMOVIC make a technical assessment to determine whether a request falls under the GRL. If it does, the request is forwarded to the 661 Committee; if it does not, the request is granted. However, difficulties regarding the GRL list and the dual-use nature of many of the items on it emerged. For example, Iraq reportedly tried to order atropine, a substance that is used to counter the effects of nerve agents and is not included on the GRL, with the explanation that it is used to treat heart attacks and thus has civilian uses.¹⁶⁰ Following review of the GRL, the Security Council adopted Resolution 1454, which modified the GRL by adding items such as atropine and cipro. Both drugs are subject to review if the quantities are in 'doses greater than 0.6 mg/ml' and exceed 'established consumption rates' for

¹⁵⁴ UN Security Council (note 140).

¹⁵⁵ UN Security Council Resolution 687 prohibits Iraq from possessing or developing ballistic missiles with a range greater than 150 km. The UNMOVIC report to the Security Council on 27 Jan. 2003 highlighted significant questions that had not been answered by Iraq. It noted 2 problematic projects: the development of the liquid-fuelled Al Samoud 2 missile (tested to a maximum range of 183 km); and the solid-propellant Al Fatah missile (tested to a maximum range of 161 km). The diameter of the Al Samoud 2 missile was also increased to 760 mm despite a 1994 letter from the Executive Chairman of UNSCOM directing Iraq to limit the diameter to less than 600 mm. The question of whether Iraq retained Scud-type missiles after the 1991 Persian Gulf War also remains unresolved.

¹⁵⁶ The 'oil for food' humanitarian programme modified the sanctions regime imposed in 1990 and was 'a temporary measure to provide for the humanitarian needs of the Iraqi people'. UN Security Council Resolution 986, Apr. 1995, URL <<http://www.un.org/Depts/oip/>>.

¹⁵⁷ UN Security Council Resolution 1409, 14 May 2002.

¹⁵⁸ US Mission to the UN, 'Goods Review List for Iraq: fact sheet', US/UN Press Release no. 68 (02), 14 May 2002, URL <http://www.un.int/usa/02_068.htm>.

¹⁵⁹ UN Security Council Resolution 661, 6 Aug. 1990.

¹⁶⁰ Miller, J., 'Iraq said to try to buy antidote against nerve gas', *New York Times* (Internet edn), 12 Nov. 2002, URL <<http://www.iraq.net/erica/news-e/archives/00000867.htm>>.

non-prohibited purposes.¹⁶¹ This was the second major change in the inspection programme since the adoption of Resolution 1284, which states that sanctions will be suspended for a period of 120 days if UNMOVIC and the IAEA report full Iraqi cooperation (paragraph 33). Resolution 1441 did not alter these provisions.

VI. Anti-terrorism developments

The USA and, to different degrees, other countries continued to implement wide-ranging, interrelated evaluations and measures to assess and meet the perceived threat of the use of CBW by state and non-state actors.¹⁶² They included domestic and international intelligence and police and military matters. In addition, measures related to health and safety—such as upgrading and expanding maximum containment-level laboratories, disease surveillance, and emergency preparedness and response—have been taken.

Anti-terrorism measures in the USA

Threat perception and policy and organizational developments

In 2002 the USA took measures to reorganize and increase funding for organizations to better meet a heightened perceived threat posed by CBW terrorism. On 25 November 2002, President Bush signed into law the Homeland Security Act, which established the Department of Homeland Security.¹⁶³ The cabinet-level department is designed to coordinate national security, including counter-terrorism efforts.¹⁶⁴ On 12 June 2002, Bush signed the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, which allocates almost \$1.2 billion to ensure that sufficient vaccines, drugs and related medical equipment are stockpiled. It also restricts access of individuals to select pathogens.¹⁶⁵ The act is designed to help ensure that local, state and federal agencies communicate effectively with each other and that they possess sufficient up-to-date resources and equipment. Emphasis was placed on developing ways to ensure the provision of accurate, timely information to medical practitioners and emergency response units.

On 27 August the DOD initiated the Biological Defense Homeland Security Program, a two-year programme worth approximately \$300 million, which is

¹⁶¹ UN Security Council Resolution 1454, 30 Dec. 2002, Annex A. Chemical section para. 1 and Annex A, Biological section para. 1.

¹⁶² See essay 5 in this volume.

¹⁶³ US Department of Homeland Security, 'Ready.gov', URL <<http://www.ready.gov/>>.

¹⁶⁴ See chapter 1 in this volume. White House, 'President Bush signs Homeland Security Act', Press Release, 25 Nov. 2002, URL <<http://www.whitehouse.gov/news/releases/2002/11/20021125-6.html>>; and US Department of Homeland Security, 'Department of Homeland Security homepage', URL <<http://www.dhs.gov/dhspublic/>>.

¹⁶⁵ The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (P.L. 107-188) is available at URL <<http://www.ncsl.org/statefed/health/PL107-188overview.htm>>.

designed to detect, mitigate and respond to 'biological-related incidents'.¹⁶⁶ The programme is intended to provide early warning of BW attack in select urban areas in the USA and to develop and support the infrastructure necessary for effective emergency response and management. Data from an automatic environmental monitoring system and from hospitals, pharmacies and medical offices will be fed into a central database, where the information will be systematically analysed for signs of a BW attack.

In 2001 the analytical capabilities of the Centers for Disease Control and Prevention (CDC) were taxed by the requirements of the response to the anthrax-contaminated letters that were sent to politicians and members of the media in the USA. The investigation demonstrated a need for reliable timely advice and for information to be made available to local and regional medical care providers. The CDC expanded a number of programmes in 2002, including implementation of a \$918 million grant-giving programme to state and local health authorities to better prepare response to a bioterrorism attack. This was an increase from approximately \$50 million in 2001. The CDC also expanded the National Pharmaceutical Stockpile (NPS) Program and the Laboratory Response Network, which consists of more than 200 laboratories at the CDC and elsewhere.¹⁶⁷ The purpose of the NPS programme is to ensure that pharmaceuticals, antidotes and other relevant medical supplies and equipment are available on site within 12 hours of a chemical or biological attack carried out anywhere in the USA.¹⁶⁸ The CDC also maintains an operations centre to monitor and coordinate medical responses to disease outbreaks and other emergency situations.¹⁶⁹ These programmes are being carried out in consultation with the Federal Bureau of Investigation (FBI), the Central Intelligence Agency (CIA), the Department of Justice, the Federal Emergency Management Agency, the CDC's National Institute for Occupational Safety & Health, the Department of Health and Human Services, and the Environmental Protection Agency.

Research and prophylaxis

A wide range of projects for research into vaccines, treatment and of pathogens and substances which could be used for chemical and biological warfare purposes received increased funding in 2002. Whether and how publicly available information on chemical and biological research should be restricted was also debated. The debate centred partly on a revelation that US documents produced between 1943 and 1969 describing technical aspects of BW produc-

¹⁶⁶ US Defense Technical Information Center (DTIC), 'CBDP budget item justification sheet (R-2A exhibit)', DTIC budgetary allocation information sheet, Feb. 2002, URL <<http://www.dtic.mil/descriptivesum/Y2003/CHEM/0601384BP.pdf>>; and 'News chronology' (note 74), p. 32.

¹⁶⁷ Centers for Disease Control and Prevention (CDC), 'CDC's terrorism preparedness: one year later', CDC information sheet, 27 Aug. 2002, URL <<http://www.cdc.gov/od/oc/media/transcripts/t020827.htm>>.

¹⁶⁸ CDC, 'National Pharmaceutical Stockpile (NPS) Program: a national repository of life-saving pharmaceuticals and medical supplies', CDC fact sheet, [n.d.]. Information on the programme is available at URL <<http://www.bt.cdc.gov/stockpile/>>.

¹⁶⁹ CDC (note 167).

tion had been declassified and posed a potential proliferation risk.¹⁷⁰ In 2002 the USA began to classify more than 6600 formerly declassified technical documents dating from the 1940s to the 1960s.¹⁷¹ A hold on the further release of other declassified documents was put into effect pending decisions by the US Government on their final status.

The USA also moved towards comprehensive vaccine and treatment policies for various chemical and biological agents. On 13 December President Bush announced a multi-stage plan to vaccinate part of the US population against smallpox.¹⁷² Related questions included the safety and efficacy of vaccine stocks (quality control); deciding who should be vaccinated first; whether and under what circumstances vaccination should be mandatory; access to vaccination for the general public; and the nature of possible side effects.

The smallpox debate

Concern has increased about the threat posed by smallpox, in part because of a heightened and renewed sense of vulnerability. Unlike anthrax, which cannot generally be spread from person to person, smallpox is readily transmissible through saliva droplets spread by breathing. If strict quarantine measures are not immediately put in place, the rate of transmission can accelerate rapidly and the outbreak become pandemic.¹⁷³ According to reports, primarily from the USA and based on intelligence information, undeclared smallpox stocks may exist and state or non-state actors may be prepared to use them.¹⁷⁴

The effort to eradicate smallpox in nature was coordinated by the World Health Organization (WHO) which, in May 1980, officially declared the dis-

¹⁷⁰ Zilinskas, R. A., 'Open publications as sources of biological and chemical terrorism: defining the problem and applying remedies', ed. J. Brown, *Implications of 9/11 on National Security and the Path Forward to Peace, Proceedings of the Twelfth Annual Arms Control Conference* (Sandia National Laboratories: Albuquerque, N. Mex., 2002), pp. 144–60.

¹⁷¹ 'News chronology' (note 31), p. 21.

¹⁷² Stage 1 consists of the voluntary vaccination, which began in Jan. 2003, of *c.* 500 000 health workers and 'first responders', including members of the Smallpox Response Teams, and the mandatory vaccination of *c.* 500 000 civilian and military personnel who are or may be deployed to 'high threat' areas. Stage 2 calls for up to 10 million health care workers and first responders to be vaccinated on a voluntary basis. Stage 3 would allow the vaccination of the general public on a voluntary basis. Stage 4, Primary Strategy: Contact Identification and Vaccination, would be implemented in the event of a smallpox outbreak. Stage 5 would be implemented in cases in which authorities determine that they are unable to contain an outbreak under stage 4; it apparently provides for mass vaccinations of the general public. Pilch, R., 'Smallpox: threat, vaccine and U.S. policy', part I, Monterey Institute of International Studies' Center for Nonproliferation Studies Research Story of the Week, Jan. 2003, URL <<http://cns.miis.edu/pubs/week/030106.htm>>.

¹⁷³ The last major effort to quarantine a smallpox outbreak was carried out in 1972 in the former Yugoslavia; the army was mobilized to seal off infected towns and *c.* 10 000 individuals were quarantined and mass vaccinations were carried out. Tucker, J., *Scourge: the Once and Future Threat of Smallpox* (Atlantic Monthly Press: New York, 2001), pp. 86–89.

¹⁷⁴ The CIA's Weapons Intelligence, Nonproliferation and Arms Control Center (WINPAC) reportedly stated that France, Iraq, North Korea and Russia were believed to possess smallpox virus. Gellman, B., '4 nations thought to possess smallpox', *Washington Post* (Internet edn), 5 Nov. 2002, p. A01, URL <<http://www.washingtonpost.com>>. France denied that it possesses smallpox stocks. French Foreign Ministry, 'Statement made by the Ministry of Foreign Affairs Spokesperson', Daily Press Briefing, 6 Nov. 2002, URL <<http://www.info-france-usa.org/news/briefing/us061102.asp>>; and 'Paris dément posséder des stocks de virus de la variole' [Paris denies possession of variola virus stocks], *Le Monde*, 8 Nov. 2002, p. 4.

ease eradicated in nature.¹⁷⁵ In recent years, however, smallpox has been viewed, principally in the West, as a dangerous potential bioterrorism threat.¹⁷⁶ Variola virus, the causative agent of smallpox, is currently stored at two officially designated facilities: the State Research Centre of Virology and Biotechnology (Vector) in Koltsovo, Russia;¹⁷⁷ and the CDC in Atlanta, Georgia.

In 2002 a WHO committee postponed a previous WHO policy calling for the destruction of Variola virus stocks by 31 December 2002 and authorized the temporary retention of the smallpox stocks stored in Russia and the USA in order to allow ‘further international research, on the understanding that steps should be taken to ensure that all approved research would remain outcome-oriented and time-limited and periodically reviewed and a proposed new date for destruction should be set when the research accomplishments and outcomes allow consensus to be reached on the timing of destruction of *Variola virus* stocks’.¹⁷⁸

The anthrax investigation

No suspects were arrested or charged in 2002 for the 2001 attacks in the USA with letters that were filled with concentrated anthrax spores.¹⁷⁹ The FBI, the lead investigatory body in the Department of Justice, has executed 800–1000 search warrants in the investigation, which allegedly is focused on a US citizen.¹⁸⁰ It is unclear whether the perpetrator was domestic or foreign, and to what extent (if any) a non-state (e.g., terrorist group) or state actor may have been involved. While there was speculation about possible connections with al-Qaeda cells or the Iraqi Government, no official information to this effect was provided by the Department of Justice.

VII. Proliferation allegations and past programmes

Allegations of use, possession and transfers

Most official government statements regarding proliferation allegations continue to be made by the USA. Congressional hearings were held in 2002 to clarify the status of countries’ compliance with international prohibitions

¹⁷⁵ ‘Smallpox is dead’, *World Health*, May 1980, available at URL <http://whqlibdoc.who.int/smallpox/WH_5_1980.pdf>.

¹⁷⁶ This is partly due to the immunological vulnerability of humans to smallpox.

¹⁷⁷ The Vector facility was visited in Oct. 2002 by a WHO-appointed team of international biosafety experts in order to ‘confirm the strict containment of existing stocks and to ensure a safe research environment for work with *Variola virus*’. WHO, ‘World Health Organization inspects Russian smallpox laboratory’, WHO Information Sheet, 25 Oct. 2002, URL <<http://www.who.int/mediacentre/notes/np7/en/print.html>>.

¹⁷⁸ WHO, ‘Smallpox eradication: destruction of *Variola virus* stocks’, 55th World Health Assembly, WHO document WHA55.15, 18 May 2002. WHO decisions are made on the basis of consensus and, partly for this reason, it is unlikely that the 2002 decision will be at variance with US or Russian policies to retain their stocks at present.

¹⁷⁹ Zanders, Hart and Kuhlau (note 9), p. 696–703. See also essay 5 in this volume.

¹⁸⁰ US Government official, Private communication with J. Hart, Mar. 2003.

against CBW.¹⁸¹ There appeared to be a shift in focus by the USA towards select countries alleged to be in violation of the BTWC and the CWC. At the 2001 session of the Fifth BTWC Review Conference, the USA stated that Iran, Iraq, Libya, North Korea, Sudan and Syria were actively pursuing BW programmes.¹⁸² President Bush stated in his 29 January 2002 State of the Union address that Iran, Iraq and North Korea constituted an 'axis of evil' intent on pursuing the development of missiles and 'weapons of mass destruction'.¹⁸³ Cuba, Libya and Syria were later named as 'three other state sponsors of terrorism that are pursuing or have the potential to pursue weapons of mass destruction'.¹⁸⁴

Paperwork and computer files that demonstrate an interest by al-Qaeda and possibly other groups in botulinum toxin, ricin and cyanide were reportedly recovered by US-led forces operating in *Afghanistan* in 2001 and 2002.¹⁸⁵ Documentation and video tapes showing al-Qaeda operatives conducting animal tests with CBW agents were also reportedly recovered.¹⁸⁶ However, it is unclear whether any BW or CW were found, and the authenticity of at least some of the video tapes was uncertain.¹⁸⁷ There were also different views on the sophistication and extent of the CBW capabilities of groups operating in Afghanistan. The head of Germany's Federal Intelligence Service (Bundesnachrichtendienst, BND) characterized them as 'primitive'.¹⁸⁸ CIA Director George J. Tenet stated that Osama bin Laden had pursued 'a sophisticated biological weapons research program'.¹⁸⁹ Pakistani scientists were alleged to have held discussions with al-Qaeda members and to have shared information on CBW.¹⁹⁰

In 2002 there were scattered reports that terrorist groups, possibly affiliated with al-Qaeda, were interested in using BW or CW for attacks in *Europe, the Middle East and Asia*.¹⁹¹ Arrests, some of which were related to attempts to

¹⁸¹ *Cuba's Pursuit of Biological Weapons: Fact or Fiction?*, Hearings of the Western Hemisphere, Peace Corps, and Narcotics Affairs Subcommittee of the Senate Foreign Relations Committee (US Government Printing Office: Washington, DC, 5 June 2002).

¹⁸² Zanders, Hart and Kuhlau (note 9), p. 674.

¹⁸³ White House, 'The President's State of the Union Address', Press Release, 29 Jan. 2002, URL <<http://www.whitehouse.gov/news/releases/2002/01/print/20010129-11.html>>. The axis was subsequently extended to other countries, including Syria.

¹⁸⁴ Bolton, J., 'Beyond the "axis of evil": additional threats from weapons of mass destruction', Presentation at the Heritage Foundation, Washington, DC, 6 May 2002, URL <<http://new.heritage.org/Research/MissileDefense/HL743.cfm>>.

¹⁸⁵ 'News chronology', *CBW Conventions Bulletin*, no. 55 (Mar. 2002), pp. 18, 25; and *CBW Conventions Bulletin* (note 74), p. 30.

¹⁸⁶ 'News chronology' (note 185), p. 26; Miller, J., 'Qaeda videos seem to show chemical tests', *New York Times* (Internet edn), 19 Aug. 2002, URL <<http://www.nytimes.com>>; and Robertson, N., 'Tapes shed new light on bin Laden's network', 18 Aug. 2002, URL <<http://www.cnn.com/2002/US/08/18/terror.tape.main/index.html>>.

¹⁸⁷ 'News chronology' (note 74), p. 30.

¹⁸⁸ BND head August Hanning is interviewed in 'Ganz neue Bedrohungsszenarien' [Completely new threat scenario], *Der Spiegel*, Aug. 2002, p. 174.

¹⁸⁹ 'Worldwide threat—converging dangers in a post 9/11 world', Testimony by CIA director George J. Tenet before the Senate Select Committee on Intelligence, 6 Feb. 2002, URL <http://www.odci.gov/cia/public_affairs/speeches/dci_speech_02062002.html>.

¹⁹⁰ 'News chronology' (note 185), p. 23.

¹⁹¹ 'Worldwide threat (note 189); and 'They're on both sides of the pond', *The Economist*, vol. 364, no. 8285 (10 Aug. 2002), pp. 26–27.

acquire or use chemical and biological agents, were made in Belgium, France, Germany, Syria, the UK, the USA and other states.¹⁹² On 19 February, in Rome, *Italian* police arrested four Moroccans with possible links to al-Qaeda; the suspects reportedly possessed approximately 4 kg of potassium ferrocyanide and maps detailing the underground tunnel system below the US embassy.¹⁹³ A hole was subsequently found in a nearby underground tunnel. On 1 March six other men—three Iraqis, an Algerian, a Pakistani and a Tunisian—were arrested in Rome and charged with, among other things, the intent to use ‘poison’.¹⁹⁴ In November three men were arrested on the suspicion that they intended to release cyanide gas in the London Underground.¹⁹⁵ In January 2003 six North Africans were arrested in their London apartments, where traces of ricin processing were discovered.¹⁹⁶

In testimony about *Cuba* before the US Senate Foreign Relations Committee, Assistant Secretary of State for Intelligence and Research Carl Ford said: ‘The United States believes that Cuba has at least a limited, developmental offensive biological warfare research and development effort. Cuba has provided dual-use biotechnology to rogue states’.¹⁹⁷ On 13 May, former US President Jimmy Carter visited Cuba’s Centre for Genetic Engineering and Biotechnology.¹⁹⁸ He said that he had been told in a private US Government intelligence briefing that the USA had no clear evidence that Cuba had been involved in sharing with other countries information that could be used for terrorist purposes.¹⁹⁹ The acting commander of the US Southern Command was later quoted as saying that while it was reported that the USA had evidence that the Cubans ‘were actually producing bio-weapons . . . I’m not sure that’s the case’.²⁰⁰ Cuban President Fidel Castro denied that his country had a BW programme.²⁰¹

In 2002 a letter from *Iran’s* foreign minister was formally submitted to the UN in response to President Bush’s State of the Union address, which char-

¹⁹² James, B., ‘Europeans step up anti-terrorist action’, *International Herald Tribune*, 25–26 Jan. 2003, pp. 1, 4.

¹⁹³ ‘News chronology’ (note 31), p. 22; and ‘“Cyanide attack” foiled in Italy’, BBC News Online, 20 Feb. 2002, URL <http://news.bbc.co.uk/hi/english/world/europe/newsid_1831000/1831511.stm>.

¹⁹⁴ ‘News chronology’ (note 31), p. 25.

¹⁹⁵ ‘Reports allege tube was possible target’, BBC News Online, 17 Nov. 2002 <<http://news.bbc.co.uk/1/hi/england/2198228.stm>>.

¹⁹⁶ Bale, J. M. *et al.*, ‘Ricin found in London: an al-Qa’ida connection?’, Monterey Institute of International Studies, Center for Nonproliferation Studies, 23 Jan. 2003, URL <<http://cns.miis.edu/pubs/reports/ricin.htm>>.

¹⁹⁷ *Cuba’s Pursuit of Biological Weapons: Fact or Fiction?* (note 181).

¹⁹⁸ The Centre for Genetic Engineering and Biotechnology Internet site is URL <<http://www.cigb.edu.cu/>>. See also Casteñada, M., ‘Carter: EE.UU. sin evidencias sobre bioterrorismo’ [Carter: EE.UU. no evidence of bioterrorism], *Granma International*, 13 May 2002, URL <<http://www.granma.cu/espanol/mayo02-3/20biot-e.html>>.

¹⁹⁹ Carter, J., ‘President Carter’s comments at Cuban Biotech Center’, Carter Center, Atlanta, Ga., 13 May 2002, URL <<http://www.cartercenter.org/printdoc.asp?docID=473&submenu=news>>.

²⁰⁰ ‘News chronology’, *CBW Conventions Bulletin*, no. 57 (Sep. 2002), p. 27.

²⁰¹ International Action Center, ‘Respuesta del Presidente de la República de Cuba a las Declaraciones del Gobierno de los Estados Unidos sobre armas biológicas [Response from Dr Fidel Castro Ruz, President of the Republic of Cuba, to the statements made by the Government of the United States on biological weapons]’, 10 May 2002, URL <http://www.iacenter.org/cuba_biowar-es3.htm>. An unofficial English translation is available at URL <http://www.iacenter.org/cuba_biowar.htm>.

acterized the country as part of an 'axis of evil'. It stated that: 'weapons of mass destruction have no place in Iran's defence doctrine. Iran is fully committed to observing all relevant international instruments on prohibition of such weapons and its compliance has been repeatedly verified by the relevant international organizations'.²⁰² There are long-standing allegations by the USA that Iran is pursuing banned CBW programmes.²⁰³

Past chemical and biological weapon programmes

Eight Chinese plaintiffs, representing 180 people who claim to be relatives of victims of Japanese BW attacks in the 1930s and 1940s, filed suit in *Japan* against the Japanese Government for the attacks. On 27 August 2002 a court ruling denied them financial compensation on the grounds that individuals are not entitled to financial compensation for the period in question.²⁰⁴ However, the court, which heard testimony from at least one former member of a Japanese BW research and development group called Unit 731, also ruled that Japan was guilty of engaging in biological warfare.²⁰⁵

Additional information on the history of the *Soviet* BW programme was made available in a report describing a smallpox outbreak in Aralsk, Kazakhstan, in September–October 1971.²⁰⁶ The report (partly based on a formerly classified Soviet analysis of the outbreak) assesses the aetiology of the smallpox outbreak,²⁰⁷ the health and environmental history of the region, and provides background on the Soviet BW programme. A total of 10 people were infected, of whom 3 died.²⁰⁸ Those initially infected were on a research vessel, located some 15 km from Vozrozhdeniye Island, the site of a former Soviet BW field-testing facility in the Aral Sea. The report notes that the smallpox outbreak was 'likely' caused by the Soviet BW programme.²⁰⁹ If true, this

²⁰² Letter dated 4 February 2002 from the Permanent Representative of the Islamic Republic of Iran to the United Nations addressed to the Secretary-General, UN document A/56/806-S/2002/140, 4 Feb. 2002.

²⁰³ Zanders, Hart and Kuhlau (note 9), p. 674.

²⁰⁴ 'News chronology' (note 185), p. 26; and 'News chronology' (note 74), p. 31.

²⁰⁵ 'News chronology' (note 74), p. 31; Watts, J., 'Japanese veteran apologises for germ warfare', *The Guardian*, 31 July 2002; and Struck, D., 'Tokyo court confirms Japan used germ warfare in China, compensation denied for deaths caused by diseases spread in WW II', *Washington Post* (Internet edn), 28 Aug. 2002, p. A15, URL <<http://www.washingtonpost.com>>. For background see Harris, S., *Factories of Death* (Routledge: London, 1994); Wallace, D. and Williams, P., *Unit 731* (Free Press: New York, 1989); Gold, H., *Unit 731 Testimony* (Yen Books: Tokyo, 1996); and Tamanoi, M. A., 'War responsibility and Japanese civilian victims of Japanese biological warfare in China', *Bulletin of Concerned Asian Scholars* vol. 32, no. 3 (2000) pp. 13–22. In accordance with the Japanese Imperial Government Disclosure Act of 2000 (Public Law 106-567), an effort is currently under way to locate information on Japanese biological warfare activities in the US national archives. See URL <http://www.archives.gov/iwg/declassified_records/declassified_records.html>.

²⁰⁶ Tucker, J. B. and Zilinskas, R. (eds.), *The 1971 Smallpox Epidemic in Aralsk, Kazakhstan, and the Soviet Biological Warfare Program*, Occasional Paper no. 9 (Monterey Institute of International Studies, Center for Nonproliferation Studies: Monterey, Calif., July 2002), available at URL <<http://cns.miiis.edu/pubs/opapers/op9/op9.pdf>>.

²⁰⁷ The last previously known outbreak occurred in 1961. Smallpox was officially eradicated in the Soviet Union in 1936.

²⁰⁸ Tucker and Zilinskas (note 206), p. iv.

²⁰⁹ Tucker and Zilinskas (note 206), p. 10.

would indicate that smallpox can be aerosolized and propagated over a distance of several kilometres.

The United States released additional information on Project 112 CBW dispersion tests. The tests, which included Operation Shipboard Hazard and Defense (SHAD), were carried out at sea and on the territory of at least three countries—Canada, the UK and the USA—in the 1960s and early 1970s.²¹⁰ SHAD veterans have complained of ailments similar to some experienced by those claiming to suffer from Gulf War Syndrome.²¹¹ In October the House Subcommittee on Health and the Senate Military Personnel Subcommittee held hearings on the tests, including possible residual health effects.²¹²

Non-proliferation efforts

On 27 June 2002, the G8 leaders announced a new initiative, the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, to fund projects on disarmament, non-proliferation, counter-proliferation, counter-terrorism and nuclear safety over the next 10 years.²¹³ The G8 members and the European Commission are to allocate \$20 billion, half of which is to be provided by the USA.²¹⁴ In January 2003, Russia announced that it would allocate at least \$2 billion over the next 10 years, \$204 million of which would be allocated for 2003.²¹⁵

The Australia Group (AG) is an ad hoc export control arrangement which attempts to ensure that transfers in dual-use CBW-related materials, technologies and equipment are not misused. In 2002 it adopted strengthened guidelines, including the addition of eight toxins to the AG control list, the lowering of the volume threshold for fermenters from 100 litres to 20 litres, and the

²¹⁰ Official documentation on the tests is available on the DOD Internet site 'DeploymentLINK, "Project 112"', URL <http://deploymentlink.osd.mil/current_issues/shad/shad_intro.shtml>.

²¹¹ See Zanders, J. P. *et al.*, 'Chemical and biological weapon developments and arms control', *SIPRI Yearbook 2001: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2001), pp. 554–47; and Zanders and Hart (note 56), pp. 486–88.

²¹² 'Hearings on Project 112 & Operation Shipboard Hazard and Defense', Hearings before the House Veterans Affairs Committee, Subcommittee on Health, 107th Congress, 9 Oct. 2002, URL <<http://www.house.gov/va/hearings/schedule107/oct02/10-9-02/witness.html>>.

²¹³ White House, 'Fact sheet G-7/8 Kananaskis Summit day two—U.S. accomplishments', Press Release, 27 June 2002, URL <<http://www.whitehouse.gov/news/releases/2002/06/20020627-8.html>>; and 'Text: G-8 initiative to help dismantle weapons of mass destruction', *Washington File* (US Department of State, International Information Program: Washington, DC, 27 June 2002), URL <<http://usinfo.state.gov/>>. Countries and organizations which have reportedly committed funds thus far include: Canada (\$650 million), the European Commission (\$1 billion), Germany (\$1 billion) and the UK (\$650 million). 'G-8 Partnership needs more funding', *Arms Control Today*, vol. 32, no. 9 (Nov. 2002), p. 31. See also chapter 14 in this volume.

²¹⁴ 'Fact sheet G-7/8 Kananaskis Summit day two' (note 213).

²¹⁵ Russian Federation Ministry of Foreign Affairs, 'Answers by the official representative of the Russian Ministry of Foreign Affairs, A. V. Yakovenko, to questions from the mass media in connection with the "Group of Eight" agreement completed in Kananaskis on the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction', 10 Jan. 2003 (in Russian), URL <<http://www.mid.ru>>.

institution of measures to ensure that information and expertise are not used for offensive CBW programmes.²¹⁶

In 2002 the WHO and the US-based non-governmental organization Nuclear Threat Initiative (NTI)²¹⁷ established the Global Emergency Response Fund to ensure that the WHO will be able to send a field unit anywhere in the world within 24 hours after an infectious disease outbreak is reported, whether due to natural causes or to the release of BW.²¹⁸ The response fund, established in the amount of \$500 000, is part of the WHO Global Outbreak Alert and Response Network, which is coordinated by its Geneva-based Alert and Response Operations Centre and staffed 24 hours a day.²¹⁹ It complements the WHO Global Public Health Intelligence Network, which collects and analyses electronic news and other information on disease outbreaks and related developments.

In September 2002, the 'Bogorodsk 2002' exercise was held in Noginsk, Russia, to practice the response of Russian security forces to a simulated terrorist attack at a chemical facility resulting in mass casualties. The exercise was held in cooperation with the Euro-Atlantic Disaster Response Coordination Centre (EADRCC) and the Euro-Atlantic Disaster Response Unit (EADRU).²²⁰ It was attended by observers from the OPCW and the UN Office for the Coordination of Humanitarian Affairs (UNOCHA).²²¹ The main purposes of the exercise were to improve the ability of the Euro-Atlantic Partnership Council countries to respond to a disaster and for Russia to coordinate its response with international disaster relief efforts.

VIII. Conclusions

Many of the efforts to constrain or ban the development, production and use of CBW agents have focused on traditional multilateral arms control and disarmament agreements. There is, however, an increased reliance on national and ad hoc cooperation measures among like-minded states on specific issues of concern to meet perceived CBW threats, including those posed by non-state actors. A wide variety of programmes and initiatives that are designed to meet the perceived threat are being implemented, including: renewed emphasis on national export control guidelines; efforts to establish and harmonize national

²¹⁶ 'News chronology' (note 200), p. 36; see also chapter 18 in this volume; and 'The Australia Group', URL <<http://www.australiagroup.net/>>.

²¹⁷ The NTI was established to reduce threats posed by NBC weapons. The NTI's Internet site is URL <<http://www.nti.org/>>.

²¹⁸ World Health Organization, 'WHO-NTI establish a Global Emergency Outbreak Response fund', WHO Press Release, 2 Dec. 2002, URL <<http://www.who.int/mediacentre/releases/pr92/en/>>.

²¹⁹ World Health Organization (note 218).

²²⁰ The EADRCC, established at North Atlantic Treaty Organization headquarters in May 1998, coordinates the response of the Euro-Atlantic Partnership Council countries to humanitarian disasters on their territories. The EADRCC established the EADRU, which is partly responsible for responding to humanitarian disasters caused by acts of chemical and biological terrorism. EADRCC, 'Exercise "Bogorodsk 2002"—lead in scenario and situation at the start of the exercise', 24 July 2002, URL <<http://www.nato.int/eadrcc/bogorodsk/scen-sit.htm>>.

²²¹ The UNOCHA is the principal body responsible for global multilateral responses to man-made or natural disasters requiring humanitarian assistance. 'News chronology' (note 74), pp. 37–38.

legal prohibitions and related legislation against CW and BW; measures to improve domestic and international disease surveillance, national and international emergency preparedness and response capabilities; and improved cooperation in law enforcement and intelligence activities.

Many countries are currently devoting resources to meet the perceived threat of the use of CBW agents by non-state actors. To the extent possible, these resources should be appropriate to the actual threat posed and take into consideration the fact that most deaths and destruction have thus far been caused by conventional explosives and firearms.²²² There are serious technical obstacles that prevent the use of many chemical and biological agents to cause mass casualties and deaths. Ricin, for example, is more suited for assassination purposes than for causing mass casualties,²²³ partly because it is extremely difficult to disperse as a viable aerosol and partly because of the difficulties in producing and transporting a usable delivery system.²²⁴ Many of the counter-terrorism activities against non-state actors are of a law enforcement and intelligence nature and have not been publicized.²²⁵ Measures are increasingly being taken to harden traditional targets against attack, and because of this in certain situations the range of possible targets and methods of attack may expand to include CBW.

It is unclear to what extent the problem of possible terrorist attacks with CBW agents requires an intelligence and law enforcement response and the extent to which a military response is called for. Broadly speaking, a military response may be necessary in cases involving the direct or indirect involvement of state actors; an intelligence and law enforcement response would probably be indicated in cases involving non-state actors that are under the jurisdiction and control of a given country. An unclear case would involve a non-state actor on the territory of another, possibly failed, state.

The purpose and role of multilateral arms control and disarmament agreements are the subject of continued discussion. Although the BTWC and the CWC regimes have been subjected to significant stress in recent years, the institutional frameworks remain intact and activities have continued at an operational level. The conventions can play a useful role in the current international security environment, partly because they provide a forum for countries to agree on politically sensitive matters which might not otherwise be agreed in a bilateral or regional context. In addition, they encourage or

²²² See also essay 5 in this volume.

²²³ The Bulgarian writer and dissident Georgi Markov was killed by agents working for the Bulgarian security service in London in 1978, when he was jabbed in the leg with an umbrella that injected a wax-covered, platinum–iridium pellet containing ricin. The cause of death was later revealed by an autopsy during which the pellet, still containing a residual amount of ricin, was recovered. Sidell, F. R., Takafuji, E. T. and Franz, D. R. (eds), *Medical Aspects of Chemical and Biological Warfare* (Borden Institute: Washington, DC, 1997), pp. 420–21.

²²⁴ In addition to technical characteristics, a delivery system would also have to be of a size and type that does not arouse undue suspicion from the public and from police monitoring systems.

²²⁵ Ninety countries are reportedly cooperating in one way or another with US-led anti-terrorism efforts. It has been estimated that terrorist cells are operating in 60 or more countries. White House, 'Remarks by the President at 2002 Graduation Exercise of the United States Military Academy West Point, New York', Press Release, 1 June 2002, URL <<http://www.whitehouse.gov/news/releases/2002/06/20020601-3.htm>>; and 'President Bush signs Homeland Security Act' (note 164).

require harmonization of national implementing legislation and regulations against CBW-related activities. International secretariats for the implementation of such agreements may also provide expertise and information on specific issues to which countries may not otherwise have access or which they may find politically difficult to obtain from other countries bilaterally. The question of how far bilateral, regional and multilateral efforts can be integrated and how they relate to each other in the current international security environment—with its increased emphasis on identifying and addressing the threat of CBW terrorism—remains open to review.

Download Citation | On Sep 1, 2001, Avner Cohe published Israel and chemical/biological weapons: History, deterrence, and arms control | Find, read and cite all the research you need on ResearchGate.Â This book provides an analysis of the development and deployment of chemical weapons from 700BC to the present day. The First World War is examined in detail since it remains the most significant experience of the chemical threat, but the Second World War, and post-war conflicts are also evaluated. Additionally, protocols attempting to control the proliferation and use of chemical weapons are assessed. The Scientists Working Group on Biological and Chemical Weapons Control, founded in 1989 at the Federation of American Scientists, moved in November 2003 to the Center for Arms Control and Non-Proliferation to join the Center's new program on biological and chemical weapons control. At present, the defining goals of the Working Group are reinforcing the norm against biological weapons, broadening the norm to encompass all misuse of biology, and supporting all of components of the Biological and Chemical Weapons Conventions.

@inproceedings{Hart2003ChemicalAB, title={Chemical and biological weapons developments and arms control}, author={J. F. Hart and Frida Kuhlau and J. Simon}, year={2003} }. J. F. Hart, Frida Kuhlau, J. Simon. Published 2003. Materials Science. Magnetizable particles ranging in size from 0.5 to 20 microns are dispersed in an insulating binder of thermosetting material to form a mixture in which such particles comprise approximately 90% of the weight of such mixture. The particles are either spherical or the mixture may be magnetizable material coated on spherical glass balls of micron size. The ([12] Avner Cohen, "Israel and Chemical/Biological Weapons: History, Deterrence, and Arms Control," *The Nonproliferation Review*, Vol. 8, No. 3 (Fall-Winter), pp. 41-42. Rear Admiral Thomas Brooks identified Egypt as a "probable" chemical weapons possessor in testimony before Congress. Brooks, statement before the Subcommittee on Seapower, Strategic and Critical Materials, 1991, p. 107.Â Anthony Cordesman, *Weapons of Mass Destruction in Iran: Delivery Systems, and Chemical, Biological, and Nuclear Programs*, (Center for Strategic and International Studies, April 28, 1998), (http://www.csis.org/component/option,com_csis_pubs/task,view/id,1325/type,1/), pp. 13-14.