

11. Chemical and biological weapon developments and arms control

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I. Introduction

The year 1997 was marked by the entry into force of the 1993 Chemical Weapons Convention (CWC) and the start of work to establish an effective disarmament regime. Progress in the negotiations on a protocol to the 1972 Biological and Toxin Weapons Convention (BTWC) was modest, although the introduction of a 'rolling text' allows for a more structured approach.¹

Despite efforts to establish or strengthen disarmament regimes for chemical and biological weapons (CBW) concern about their proliferation and use increased in 1997. In Iraq officials continued to obstruct inspections by the United Nations Special Commission on Iraq (UNSCOM) teams, and at the end of the year the crisis between the UN and Iraq escalated to the point that military intervention became a serious possibility. Tear-gas was used for the first time after the entry into force of the CWC—by military forces in Bosnia and Herzegovina. This event highlighted a grey area in the convention. Cuba formally accused the United States of waging biological warfare and initiated the BTWC procedure to discuss such types of allegation, the first time this has occurred since the convention entered into force in 1975. Measures to counter proliferation increased in Western countries.

Section II of this chapter deals with the declarations regarding past chemical weapon programmes, the destruction of chemical weapons in Russia and the USA, and abandoned CW in China. The relation to the CWC of the use of riot-control agents by peacekeeping forces is also investigated. The efforts to strengthen the BTWC disarmament regime are discussed in section III. Sections IV and V deal with CBW proliferation concerns and allegations of use and the UNSCOM activities in Iraq, respectively. The Gulf War illnesses are addressed in section VI.

II. Chemical weapon disarmament

The creation of a disarmament regime

The CWC entered into force on 29 April 1997, and after four years of preparation the Organisation for the Prohibition of Chemical Weapons (OPCW) became operational and began its mandated tasks. As of 1 January 1998, 106 states had deposited their instruments of ratification or acceded to the

¹ A brief summary of both conventions and lists of parties are given in annexe A in this volume.

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CWC (including the five permanent members of the UN Security Council), and 59 states had signed but not ratified the convention.² France and the United Kingdom deposited their instruments of ratification in 1995 and 1996, respectively. Although the US Senate earlier refused to give its consent, the United States ratified the CWC on 24 April 1997. In Congress a vigorous campaign mounted by the Clinton Administration and supported by a broad coalition of non-governmental organizations (NGOs), the chemical industry and former governmental officials overcame the resistance of conservative Republicans. The Senate nonetheless attached 28 conditions to the ratification, which focus on the Senate's views on aspects of the CWC; reporting, consultation and notification of Congress; financial and resource commitments; implementation tasks; and US safeguards, especially as regards the ability of the USA to defend itself effectively.³ By the end of 1997 Congress had not passed national implementation legislation, and the USA thus failed to meet some CWC requirements. China approved the CWC on 30 December 1996 but waited for the US ratification before depositing its instrument of ratification on 25 April 1997. The ratification process in Russia was more arduous as a consequence of internal political developments, concern about the high cost of implementation in view of the frailty of the economy and the local environmental impact of the destruction of Russia's huge CW stockpile. The Duma initially considered ratification on 23 April⁴ but delayed action until the autumn. Russia deposited its instrument of ratification on 5 November, before the Second Conference of the States Parties on 1–5 December 1997. Several countries waited for the US cue before taking action on the CWC and, consequently, some of them failed to ratify the convention before it entered into force; they could thus neither become original parties nor attend the First Conference of the States Parties, held on 6–24 May 1997, as full members.⁵

Despite controversy over the interpretation of some articles, the CWC has attracted the ratification of states in regions of high tension. In some cases, joining the convention amounted to an act of unilateral disarmament in the face of a hostile neighbour believed to possess CW or superior conventional or nuclear weapons, thus expressing confidence in the security regime offered by the CWC. Some of these countries are presumed CW possessors or have admitted to having a CW programme. South Korea became an original party to the CWC despite continuing reports that North Korea might launch a surprise missile strike with chemical agents against South Korea. In October 1997 Pakistan joined India as a party to the CWC. Pakistan's delay in ratifica-

² States that accede to the CWC or deposit their instruments of ratification after 29 Apr. 1997 become parties only 30 days after deposit of the instrument of ratification or accession. See appendix 11A in this volume for a discussion of the entry into force of the convention.

³ US Senate, *Congressional Record*, 24 Apr. 1997, pp. S3651–57. The effects of the conditions are discussed in Gordon, A., 'Implications of the US resolution of ratification', *CBW Conventions Bulletin*, no. 38 (Dec. 1997), pp. 1–6.

⁴ 'Duma to consider Chemical Weapons Convention ratification soon', Interfax via Maximov Online, 16 Apr. 1997, URL, <<http://www.maximov.com/scripts/recent.pl?ref=2058>>, version current on 25 Apr. 1997.

⁵ A chronological overview of ratifications and accessions is available at the SIPRI CBW Project web site, URL <<http://www.sipri.se/cbw/docs/cw-cwc-ratchrono.html>>.

tion may partially have been the consequence of political instability in early 1997. Some senior active and retired military officers also voiced concern about abandoning an important military option in the face of Indian hegemony both before and after Pakistan's ratification. Although the government was not required to seek parliamentary consent, it was criticized for depositing the instrument of ratification without doing so—thus denying public debate on the security value of retaining the military option of chemical warfare.⁶ India, which became a party on 3 September 1996, threatened in March 1997 to withdraw from the CWC on the grounds that its two main regional rivals, China and Pakistan, and the two possessors of the world's largest stocks, Russia and the United States, were not parties.⁷ India's threat was not carried out since China and the USA deposited their instruments of ratification in April 1997. The statement, which was repeated on 6 August,⁸ was probably made to allay domestic fear that India was compromising its national security by joining the CWC and to emphasize some Indian positions on the CWC to other parties.

The number of Arab parties to the CWC rose to nine in 1997, despite the position adopted by the League of Arab States not to ratify the CWC unless Israel joins the 1968 Non-Proliferation Treaty (NPT). The countries in the geographical periphery of the Arab–Israeli conflict—the Maghreb and the Persian Gulf region—became parties in part because of the negative economic impact the convention would otherwise have had on their oil and chemical industries.⁹ Jordan, which borders Israel and with which it has a peace treaty, acceded to the CWC on 29 October. The Middle East, however, also has the highest concentration of non-signatory states, most of which are widely considered to be actively involved in CW armament programmes: Egypt, Eritrea, Iraq, Lebanon, Libya, Sudan and Syria. In early September 1997 speculation increased as to whether Israel would become a party,¹⁰ but on 4 September Eytan Bentsur, Director-General of the Ministry of Foreign Affairs, told the Conference on Disarmament in Geneva that Israel would not do so because of the increasing CW threat from its neighbours.¹¹ Following a 10 April verdict by the Berlin Criminal Court (Berliner Kammergericht) that Iranian author-

⁶ Jilani, F. (Brig.), 'Indian chemical warfare capability', *NDC Journal*, vol. 9, no. 1 (National Defence College: Islamabad, 1996), pp. 71–73; and *Rawalpindi Nawa-i-Waqt*, 12 Jan. 1998, pp. 5, 8, in 'Pakistan: retired generals criticize signing of CWC', Foreign Broadcast Information Service, *Daily Report–Near East and South Asia (FBIS-NES)*, FBIS-NES-98-089, 15 Jan. 1998. In the latter article, one general wrongly claimed that India had not yet signed the CWC. H. A., 'Pakistan to ratify CWC if others do: FO', *Dawn* (Karachi), 25 Apr. 1997.

⁷ 'India threatens to quit chemical weapons treaty', *The Muslim* (Islamabad), 18 Mar. 1997; 'Chemical reactions', *Times of India*, 19 Apr. 1997, p. 10; and *Navbharat Times* (New Delhi), 28 Apr. 1997, in 'India: signing of chemical weapons treaty', FBIS-NES-97-083, 1 May 1997.

⁸ P. H., 'India can walk out of chemical pact: PM', *The Hindu* (Madras), 7 Aug. 1997.

⁹ See the section on 'The international debate concerning the Australia Group' in chapter 9 in this volume.

¹⁰ Eshel, D. (Lt-Col, ret.), 'Israel grapples with CWC ratification', *Armed Forces Journal*, Sep. 1997, p. 24; and Associated Press, 'Israel might OK chemical weapon ban', via *The Wire*, 3 Sep. 1997, URL <<http://wire.ap.org/APnews/center?STORYOID=206b.8924&FRONTID=MIDEAS>>, version current on 5 Sep. 1997.

¹¹ Permanent Mission of Israel (Geneva), Statement by H. E. Mr Eytan Bentsur, Director-General of the Ministry of Foreign Affairs of Israel, before the Conference on Disarmament, 4 Sep. 1997, pp. 7–8.

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ities were involved in the bombing of a restaurant, Iran delayed the deposit of its instrument of ratification until 3 November 1997.

Declarations of CW possession and programmes

Under Article III of the CWC each party must declare its chemical weapon stockpile, old and abandoned chemical weapons, and production facilities not later than 30 days after the convention enters into force for it. Unless the party chooses to make such information public, it remains confidential to the OPCW and available to other parties. Few such announcements were made in 1997. The OPCW began its preliminary inspections on 1 June in the USA.

Data on the Russian and US stockpiles and programmes have been available for some time.¹² In an effort to set a precedent of transparency the UK published part of its detailed declaration to the OPCW relating to its former offensive CW programme at the end of May 1997.¹³ On 26 June India submitted details of what an Indian foreign affairs spokesman called 'its chemical weapons hoards and production facilities' to the OPCW.¹⁴ The details were not made public, although a New Delhi-based military analyst suggested that the Indian Army had no access to the CW stockpiles, which remain at a laboratory of the Defence Research and Development Organisation (DRDO) which produced the weapons.¹⁵ The OPCW inspected a DRDO chemical weapon facility at Gwalior in July and a laboratory at Ozra in August.¹⁶

On 31 October 1997, the OPCW completed its draft report on the implementation of the convention for the Second Conference of the States Parties.¹⁷ One hundred states were then parties to the CWC: 68 of these states had submitted the required initial declarations and 32 had not. Sixty-five states made declarations under Article III, five states under Article V on CW production facilities,¹⁸ and 56 states under Article VI on non-prohibited activities. Infer-

¹²Zanders, J. P., Eckstein, S. and Hart, J., 'Chemical and biological weapon developments and arms control', *SIPRI Yearbook 1997: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1997), pp. 445–51.

¹³United Kingdom of Great Britain and Northern Ireland, Declaration of past activities relating to its former offensive chemical weapons programme, via British Embassy, Stockholm, May 1997. Some 40 pages (of 238 pp.) were blanked out for national security reasons.

¹⁴'India calls on Pakistan to reveal chemical weapon arsenals', Agence France-Presse via Nando.net, 26 June 1997, URL <http://pele.nando.net/newsroom/ntn/world/062697/world16_25025.html>, version current on 26 June 1997; and 'India opens its chemical weapons for scrutiny', *Times of India* (New Delhi), 27 June 1997. For years India had formally denied the existence of a CW armament programme. The declaration therefore caused a controversy about the trustworthiness of India in disarmament and non-proliferation questions. Dixit, A., 'India must reclaim position as leader in nonproliferation', *Defense News*, vol. 18, no. 32 (11–17 Aug. 1997), p. 15; and Kremmer, C., 'Ten years later, Indians come clean', *Sydney Morning Herald*, 28 June 1997, URL <<http://www.smh.com.au>>, version current on 22 July 1997.

¹⁵Kremmer (note 14).

¹⁶Bedi, R., 'Indian chemical bases come under scrutiny', *Jane's Defence Weekly*, vol. 28, no. 6 (13 Aug. 1997), p. 5.

¹⁷Organisation for the Prohibition of Chemical Weapons, Draft report of the Organisation on the implementation of the Convention, OPCW document C-II/2, 31 Oct. 1997.

¹⁸The 5 countries were China, France, Japan, the UK and the USA. India and South Korea requested that the information pertaining to their declarations not be included in OPCW document C-II/2 (note 17).

ences, which cannot be confirmed, can be drawn about CW programmes after World War II from the initial inspections conducted under Article V (i.e., the first visit to a declared production facility). Inspectors visited two such installations in China, six in France, one in Japan, eight in the UK and nine in the USA. India and South Korea both requested that information regarding inspections on their territories be excluded from the OPCW inspections report to the First Conference of the States Parties. However, four initial Article V inspections were conducted three different times in unnamed states, so it may be presumed that both countries had CW production facilities.¹⁹

This tentative picture is of necessity incomplete because many parties did not submit declarations within 30 days of the entry into force of the CWC for them or were not yet required to do so at the time the OPCW draft report was completed because of the date of their accession. In addition, the publicly available information does not reveal when the CW programmes were active or terminated. As the OPCW is bound to its confidentiality obligation and in view of persistent allegations of CW proliferation, confidence in the emerging CWC regime would be greatly strengthened if individual parties were more forthcoming with public information on relevant past activities. For at least two parties, France and India, the limited publicly available data appear to be or are at odds with past formal statements on the non-possession of chemical weapons or CW-related programmes.²⁰

Destruction of chemical weapons

The United States

In the USA, CW destruction continued in 1997. The US stockpile is stored at nine locations,²¹ but only two disposal facilities were operational: the Johnston Atoll Chemical Agent Disposal System (JACADS) and the Tooele Chemical Agent Disposal Facility (TOCDF).²² By the end of October, 2191 tons or 6.96 per cent of the total stockpile had been destroyed at these sites. At JACADS 69 per cent of the CW stored there had been destroyed. This comprised 49 327 sarin-filled, 105-mm projectiles; 100 811 sarin-filled, 155-mm projectiles; 2570 MK-94 (500-pound or approximately 227-kilogram) bombs filled with sarin; 3047 MC-1 (750-pound or c. 340-kg) bombs filled with sarin; 72 242 M-55 sarin and VX-filled rockets and

¹⁹ On the basis of the press reports regarding India mentioned above, it would appear that South Korea declared 1 facility.

²⁰ In Oct. 1997 it was revealed, e.g., that France had conducted CW tests in Algeria until 1978, 16 years after Algeria's independence. Jauvert, V., 'Quand la France testait des armes chimiques en Algérie' [When France tested chemical weapons in Algeria], *Le Nouvel Observateur*, 23-29 Oct. 1997, pp. 10-22.

²¹ The locations are Edgewood Chemical Activity, Aberdeen Proving Ground, Maryland; Anniston Chemical Activity, Anniston, Alabama; Blue Grass Chemical Activity, Richmond, Kentucky; Newport Chemical Depot, Newport, Indiana; Pine Bluff Chemical Activity, Pine Bluff, Arkansas; Pueblo Chemical Depot, Pueblo, Colorado; Deseret Chemical Depot, Tooele, Utah; Umatilla Chemical Depot, Hermiston, Oregon; and Johnston Atoll Chemical Agent Disposal System, Johnston Atoll (south-west of Hawaii). For further details, see Zanders, Eckstein and Hart (note 12), pp. 449-51.

²² There is also a Chemical Demilitarization Training Facility located in Maryland.

warheads; 45 108 blister agent-filled, 105-mm projectiles; 68 blister agent-filled ton containers; and 66 sarin-filled ton containers. The TOCDF destroyed 11 592 M55 sarin-filled rockets, 970 sarin-filled ton containers and 1 619 587 pounds (c. 736.2 tonnes) of sarin.²³

At most locations CW destruction activities are estimated to be completed by 2004 or 2005. On 19 June 1997, Alabama issued a hazardous waste permit for the Anniston Chemical Disposal Facility, which enabled construction work to proceed. It is expected that 32 months will be needed for construction, with an additional 18–22 months for setting up and testing the disposal system before destruction can begin.²⁴ There are no estimated dates of completion for the Blue Grass Chemical Activity and the Pueblo Chemical Depot because the US Army was still assessing technologies which could be used instead of incineration, and meanwhile construction work is prohibited.²⁵ The JACADS stockpile is scheduled to be eliminated by 2000.²⁶ However, serious concern has been expressed about whether the projected completion dates will be met.²⁷ The army has consistently underestimated the time needed to reach agreements with states and local communities on the disposal method to be used at the stockpile sites. In the 1997 Authorization and Appropriation Acts Congress directed that research and development (R&D) be carried out on alternative CW destruction technologies, in response to public concern.²⁸ The General Accounting Office (GAO) forecast that the stockpile programme will exceed its \$12.4 billion estimated cost and take longer than the projected completion date of 31 December 2004.²⁹ According to other estimates, it will be difficult to achieve total stockpile destruction by 2007, the CWC deadline.³⁰

The army's Non-Stockpile Chemical Materiel Project deals with five categories of chemical warfare *matériel*: (a) binary CW; (b) miscellaneous chemical warfare items, including unfilled munitions, support equipment and devices to be employed in conjunction with the use of CW; (c) recovered chemical weapons; (d) former production facilities; and (e) buried chemical

²³ US Army Program Manager for Chemical Demilitarization, 'World's first chemical weapons disposal facility reaches new milestone', Press Release, 30 Oct. 1997, URL <http://www-pmcd.apgea.army.mil/CSDP/csdp_ip_pr_103097.html>, version current on 11 Mar. 1998.

²⁴ US Army Program Manager for Chemical Demilitarization, 'RCRA permit granted for construction of Anniston Chemical Agent Disposal Facility', *CSDP Newsletter*, Sep. 1997, URL <http://www-pmcd.apgea.army.mil/CSDP/csdp_ip_nl997_001.html>, version current on 11 Mar. 1998.

²⁵ Zanders, Eckstein and Hart (note 12), p. 451; and Miller, C. and Larson, C., 'US dilemmas in meeting the CWC's destruction deadline', *Nonproliferation Review*, vol. 5, no. 2 (winter 1998), p. 105.

²⁶ US Army Program Manager for Chemical Demilitarization, 'CSDP site locations', URL <http://www-pmcd.apgea.army.mil/CSDP/csdp_sl.html>, version current on 1 Feb. 1998.

²⁷ According to Public Law 102-484, National Defense Authorization Act for Fiscal Year 1993, the CW destruction deadline is 31 Dec. 2004. However, the US Army already accepts a closure date of 2005 for the Anniston Chemical Disposal Facility.

²⁸ US General Accounting Office, *Chemical Weapons and Materiel: Key Factors Affecting Disposal Costs and Schedule*, GAO/NSIA-97-18 (General Accounting Office: Washington, DC, Feb. 1997), p. 6.

²⁹ US General Accounting Office (note 28), pp. 28–29. Another estimate placed the total cost of destroying the stockpile at \$15.7 billion. Smith, H., 'DOD chemical demilitarization program', Presentation at Fall Meeting of the Board on Army Science and Technology of the National Research Council, 18 Nov. 1997, quoted in Miller and Larson (note 25), p. 102.

³⁰ Miller and Larson (note 25), pp. 102, 103, 106.

warfare *matériel*.³¹ The US Army has identified 64 potential locations in 31 states where CW *matériel* is believed to be buried. It is estimated that it will take 40 years to implement the programme with respect to buried CW *matériel* and cost approximately \$15.2 billion.³² The other categories of non-stockpile chemical *matériel* must be destroyed according to the convention-mandated time-lines.

The Russian Federation

While the Duma delayed Russian ratification of the CWC until the autumn of 1997, it passed a comprehensive destruction act, Federal Law 76-FZ, on 25 April 1997, which President Boris Yeltsin signed into law on 2 May.³³ The cost of destruction of the Russian CW stockpile of approximately 40 000 agent tonnes is generally estimated at \$3.5–5 billion.³⁴ On 17 March, the day on which Yeltsin submitted the CWC to the Duma, commander of the Russian NBC [nuclear, biological and chemical] Protection Troops³⁵ Colonel General Stanislav Petrov stated that the programme will cost 24 000 billion roubles,³⁶ a much higher figure than the cost estimate of 16 642 billion roubles in Presidential Decree 305, which was introduced on 21 March 1996. That decree also stated that destruction would begin in 1998, but the starting date remained unclear throughout 1997. Approximately 120 billion roubles (\$24 million) were allocated for CW destruction-related activities in the 1997 budget, although funding needs had been assessed at over 10 times that figure, and 500 billion roubles will reportedly be allocated in 1998.³⁷ Insufficient funding to date has led to an estimated delay of two to three years in the implementation of Decree 305. Such delays also increase the overall cost. According to one estimate, a 15-year delay in the destruction programme would raise the cost by 25 per cent, and a 20-year delay would lead to a 50 per cent increase.³⁸

³¹ US Army Program Manager for Chemical Demilitarization, 'Five categories of non-stockpile chemical materiel', URL <http://www-pmcd.apgea.army.mil/NSCMP/nscmp_h_5cat.html>, version current on 1 Feb. 1998.

³² US General Accounting Office (note 28), p. 4, fn 1 and p. 42.

³³ 'Ob unichtozhenii khimicheskogo oruzhiya' [On the destruction of chemical weapons], Federal Law no. 76-FZ, 25 Apr. 1997, in *Krasnaya Zvezda*, 17 May 1997; and Georgiyev, V., 'Minoborony gotovo k unichtozheniyu khimicheskogo oruzhiya' [Ministry of Defence prepared for chemical weapon destruction], *Nezavisimaya Gazeta*, 21 June 1997, p. 2.

³⁴ Sergey Baranovsky, Executive Secretary of Green Cross, Russia, has stated that the cost could be \$6–9 billion. 'News headlines for 10/17/97', Interfax, *Today's News*, 17 Oct. 1997, URL <<http://www.interfax-news.com/TodayFSUNews/today.html>>, version current on 17 Oct. 1997.

³⁵ The name in Russian is Rossiyskiye Khimicheskoye Voiska (RKhV).

³⁶ Kortunov, S., 'Russia must become a full-fledged member of the OPCW', *Chemical Weapons and Problems of Their Destruction*, no. 4 (PIR Center: Moscow, summer/autumn 1997), p. 6. The figure includes 1150 billion roubles for environmental monitoring, 1800 billion roubles for regional infrastructure and 400 billion roubles for medical and sanitary services to the local population.

³⁷ Averre, D. and Khripunov, I., 'Russian chemdemil coaxing communities', *Jane's Intelligence Review*, vol. 9, no. 6 (June 1997), pp. 257–59; and 'Russia: law on Chemical Weapons Convention ratification detailed', Foreign Broadcast Information Service, *Daily Report–Soviet Union (FBIS-SOV)*, FBIS-SOV-97-310, 6 Nov. 1997.

³⁸ Kortunov (note 36), pp. 8, 11.

In addition Russia must pay the costs of OPCW inspections on its territory, which have been estimated at \$13 million per year.³⁹

At the end of 1997, three documents formed the legal basis for the destruction of CW in Russia: the 'Special federal programme, destruction of chemical weapons stockpiles in the Russian Federation',⁴⁰ Federal Law 76-FZ⁴¹ and the CWC ratification act.⁴²

Federal Law 76-FZ defines terms and concepts and the responsibilities of the bodies involved in CW destruction. It also envisages the creation of special zones around CW storage and destruction facilities and the establishment of a network of laboratories and health institutions to monitor for signs of adverse health effects from the activities of such facilities and to deal with the possible consequences.

The CWC ratification act outlines the responsibilities and obligations of the Russian President, the Russian Federation Government and the Federation Council. The president is given the responsibility for overseeing the implementation of CW destruction and ensuring compliance with the provisions of the CWC. The act also requires him to take into account Russia's economic situation when implementing CWC destruction deadlines and mandates that the safest available destruction technologies be used. The government is responsible for implementation of activities such as coordinating international destruction assistance and carrying out related health and safety measures. The Federation Council is to provide 'oversight'. In particular, it will review the annual report prepared by the government and submitted by the president. The information on destruction activities which is to be included in the report consists of the status of the implementation of the CWC, the amount of chemical weapons destroyed, the status of the construction of CW destruction facilities and of the destruction or conversion of former CW production facilities, the condition of the CW stockpiles, the environmental situation at the CW storage and destruction areas, and the health of CW facility personnel and civilians living in the vicinity of such facilities. The act also explicitly leaves open the possibility of the conversion of CW production facilities. If there is disagreement between the Russian Government and the OPCW regarding the OPCW's refusal of Russian conversion requests, for example, Russia 'shall implement procedures in accordance with generally recognized

³⁹ Kalyadin, A., 'Russia's dilemmas in the area of chemical disarmament', *Chemical Weapons and Problems of Their Destruction* (note 36), p. 31. The amount to be repaid has yet to be agreed by the OPCW.

⁴⁰ 'Federalnaya tselevaya programma' [Special federal programme], *Rossiyskaya Gazeta*, Presidential decree no. 305, 2 Apr. 1996, pp. 5–6; and Russian Federation, Special federal programme, destruction of chemical weapons stockpiles in the Russian Federation, Preparatory Commission document PC-XIV/B/WP.7, 25 June 1996, pp. 19–20.

⁴¹ 'Ob unichtozhenii khimicheskogo oruzhiya' (note 33), pp. 3, 7.

⁴² 'O ratifikatsii Konventsii o zapreshenii razrabotki, proizvodstva, nakopleniya i primeneniya khimicheskogo oruzhiya i ob ego unichtozhenii' [On the ratification of the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction], Federal Law no. 138-FZ, 5 Nov. 1997. An unofficial translation is published in *CBW Conventions Bulletin*, no. 38 (Dec. 1997), pp. 6–8.

principles and standards of international law and international treaties of the Russian Federation'.⁴³

Because in the former Soviet Union chemical weapons were generally produced in a relatively small area of the large industrial chemical complexes, Russia continues to attach great importance to the issue of conversion of former CW manufacturing installations. According to the CWC, a state party must obtain permission from the OPCW to convert such facilities for non-prohibited purposes. For Russia, obtaining such permission may be critical to the success of joint ventures with foreign companies. For instance, on 12 September 1997 DuPont and Khimprom announced a joint venture to produce pesticides at Khimprom's Novocheboksarsk site, located some 640 kilometres east of Moscow. Prior to the agreement, DuPont had asked the Science Applications International Cooperation (SAIC) to conduct an assessment to ensure that no part of the facility involved in the joint venture had previously produced CW.⁴⁴ The Russian Government does not wish to risk a negative response from the OPCW. It has also expressed concern that it could be forced to pay for the inspection of an entire chemical complex although only a small part may have been used for CW production in the past.⁴⁵

Finland, Germany, the Netherlands, Sweden and the USA continued to provide CW destruction assistance in 1997. Finland has reportedly offered assistance totalling 2 million Finnish marks.⁴⁶ Germany and Russia reached agreement on 2 April 1997 on the distribution of 7.7 million Deutschmarks for the Russian CW destruction programme.⁴⁷ On 18 June 1997 the Netherlands and Russia signed a memorandum of understanding on Dutch CW destruction assistance.⁴⁸ In addition, the European Council of the European Union (EU) decided on 21 May 1997 to offer assistance for activities related to the implementation of the CWC worth up to 10–15 million European Currency Units (ECU), equivalent to \$11.5–17.2 million, for the period 1997–99 through the programme for Technical Assistance for the Commonwealth of Independent States (Tacis). There is an expectation that the Tacis programme will be accompanied by a dialogue between the EU and Russia on the implementation of the CWC. At its 17 November meeting the Working Group on Global Disarmament and Arms Control agreed to initiate the dialogue in 1998 in the

⁴³ Federal Law no. 138-FZ (note 42), Article 4, para. 1, as translated in *CBW Conventions Bulletin*, no. 38 (Dec. 1997), p. 8.

⁴⁴ DuPont, 'DuPont and A. O. Khimprom to form JV for crop protection products in Russia', Press Release, 12 Sep. 1997, URL <http://biz.yahoo.com/prnews/97/09/12/dd_y0006_1.html>, version current on 12 Sep. 1997; and Ember, L., 'Converting chemical arms plants to peaceful uses', *Chemical & Engineering News*, vol. 75, no. 38 (22 Sep. 1997), p. 10.

⁴⁵ The details of the verification regime for converted plants are outlined in Part V, D of the Verification Annex of the CWC.

⁴⁶ '17 March', *CBW Conventions Bulletin*, no. 36 (June 1997), p. 21; and Kapashin, V. (Maj.-Gen.), 'Expert opinion: who and what will help Russia to eliminate chemical weapons?', RIA Novosti, *Russian Executive and Legislative Newsletter*, no. 37 (19 Sep. 1997), URL <<http://www.ria-novosti.com/products/reln/1997/09/19-1-12.htm>>, version current on 19 Sep. 1997. Finnish assistance reportedly consists of the provision of monitors, including X-ray fluorescence detectors. Private communication by the author with a Dutch government official, 12 Dec. 1997.

⁴⁷ '2 April', *CBW Conventions Bulletin*, no. 36 (June 1997), p. 23.

⁴⁸ Private communication by the author with a Dutch government official, 19 June 1997.

first semester of the British presidency of the EU.⁴⁹ In 1997 the USA allocated a total of \$135.5 million under the Cooperative Threat Reduction (CTR) programme to support Russian CW destruction at Shchuchye.⁵⁰

Old and abandoned chemical weapons

More information about old and abandoned chemical weapons became public in 1997.⁵¹ By the end of October 1997, Belgium, China, France, Germany, Italy, Japan and the UK had made declarations related to old and abandoned chemical weapons to the OPCW under Part IV(B) of the CWC Verification Annex.⁵² In one interesting case, Poland did not make such a declaration as regards the 9.326 tonnes of adamsite which are located on its territory. The adamsite is presumed to be of German origin, but because Poland needed to repackage it for storage it is no longer possible to determine the country of origin, the reason for its import and the identity of the importer.⁵³

The entry into force of the CWC and the 25th anniversary of the 1972 Sino-Japanese peace and friendship agreement⁵⁴ prompted China and Japan to intensify efforts to resolve their long-standing dispute over the chemical weapons which Japanese troops abandoned in China in World War II. Between April and August 1997 working-level talks stalled over disagreement about the number of shells—China estimates them at nearly 2 million, while Japan places the figure at approximately 700 000—and how to destroy them.⁵⁵ However, on 1 October Japan created the Abandoned Chemical Weapons Coordination Division, a special team within the Cabinet Councillor's Office on External Affairs, to develop a plan for the disposal of the chemical weapons. Japan hoped to start the CW disposal in April 1998 in order to meet the CWC requirements. It sent two additional investigative teams to China in May and November 1997, bringing the total number of such missions to nine.

⁴⁹ 'Takis chemical weapons assistance programme to Russia', Information Note of the Commission Services, CODUN (Cooperation on Disarmament in the UN System) document, session no. 4/98, 26 Feb. 1998. The 1997 Takis Action Programme included 3 million ECU (\$3.4 million) for Russia's former CW facilities and 4 million ECU (\$4.6 million) for a 2nd project to start in 1998.

⁵⁰ On CTR funding see Zanders, Eckstein and Hart (note 12), p. 448; and chapter 10 in this volume. The areas designated to receive CTR funding at Shchuchye are: (a) chemical processing equipment, (b) munitions processing equipment, (c) safety monitoring equipment, (d) process chemicals storage, (e) maintenance, (f) waste water treatment, (g) industrial waste storage and landfill, (h) emergency support, and (i) a camp for construction workers. The Shchuchye CW destruction facility is designated 'Object 1597'. Lajoie, R. (Maj.-Gen.), 'U.S. support to the Russian CW destruction program', Paper presented at intergovernmental meeting, Moscow, 22 Oct. 1997, pp. 3, 4, 8.

⁵¹ Stock, T. and Lohs, Kh. (eds), *The Challenge of Old Chemical Munitions and Toxic Armament Wastes*, SIPRI Chemical & Biological Warfare Studies, no. 16 (Oxford University Press: Oxford, 1997).

⁵² OPCW document C-II/2 (note 17). The declarations may pertain both to the presence of old and abandoned CW on the territory of a state party and to the recognition by a state party that it has abandoned CW on the territory of another country.

⁵³ Witkiewicz, Z. and Szarski, K., 'The history of chemical weapons in Poland', eds Stock and Lohs (note 51), p. 117.

⁵⁴ Joint Communiqué of the Government of Japan and the Government of the People's Republic of China, Peking, 29 Sep. 1972, *White Papers of Japan 1973-74* (Japan Institute of International Affairs: Tokyo, 1975), pp. 61-62.

⁵⁵ Tokyo Kyodo News Service, 26 Aug. 1997, in 'Japan: Kajiyama on creation of chemical weapons disposal office', Foreign Broadcast Information Service, *Daily Report-East Asia (FBIS-EAS)*, FBIS-EAS-97-238, 27 Aug. 1997.

After cutting open some shells, one team found that the munitions were still highly explosive and that great care will need to be taken during disposal.⁵⁶

The CWC and the use of riot-control agents in peacekeeping operations

On 28 August 1997 heavily armed troops of the North Atlantic Treaty Organization (NATO)-led Stabilization Force (SFOR) had to evacuate more than 40 officers of the International Police Task Force from the Bosnian Serb town of Brcko after clashes erupted between peacekeeping forces and civilians. In what was described as one of NATO's worst confrontations in Bosnia and Herzegovina since the 1995 Dayton Agreement,⁵⁷ US helicopters dropped tear-gas and soldiers fired warning shots to disperse the crowd.⁵⁸ Another US unit used tear-gas in a second incident on 1 September after being attacked by about 250 people armed with sticks and stones near Bijeljina, a village close to Brcko.⁵⁹

Under the CWC riot-control agents are classified as toxic chemicals;⁶⁰ they therefore fall under the general purpose criterion.⁶¹ Their use is consequently prohibited as a method of warfare but permitted for law enforcement purposes, including domestic riot control.⁶² The line between law enforcement and use as a method of warfare can become thin if troops are deployed between hostile factions as could occur, for example, in UN peacekeeping missions.⁶³ The resort to tear-gas by UN peacekeeping forces has been extremely rare. The only known documented instance occurred on 10 March

⁵⁶ Ministry of Foreign Affairs of Japan, 'Press conference by the Press Secretary', 13 June 1997, URL <<http://www.mofa.go.jp/press/1997/6/613.html>>, version current on 11 Mar. 1998; Tokyo Kyodo News Service, 20 Oct. 1997, in 'Japan: WWII chemical weapons found still "live" in China', FBIS-EAS-97-293, 22 Oct. 1997; and Tokyo Kyodo News Service, 13 Nov. 1997, in 'Japan: Japan to send chemical weapons disposal mission to China', FBIS-EAS-97-317, 17 Nov. 1997.

⁵⁷ The text of the General Framework Agreement for Peace in Bosnia and Herzegovina is reproduced in *SIPRI Yearbook 1996: World Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1996), pp. 232–33.

⁵⁸ 'UN police evacuated in troubled Bosnian town', CNN Interactive, 28 Aug. 1997, URL <<http://www.cnn.com/WORLD/9708/28/bosnia.update/index.html>>, version current on 28 Aug. 1997; and Associated Press, 'NATO troops attacked in Serb-held towns, one American injured', *Boston Globe Online*, 28 Aug. 1997, URL <http://www.boston.com/dailynews/wirehtml/240/NATO_troops_attacked_in_Serb_held_t.htm>, version current on 28 Aug. 1997.

⁵⁹ Dinmore, G., 'US unit repels Serb mob with tear gas', *Financial Times*, 2 Sep. 1997, p. 1.

⁶⁰ Article II, paras. 2 and 7.

⁶¹ Under the general purpose criterion of the CWC certain purposes for which objects may be employed are prohibited, but not the objects themselves. Article II of the CWC thus defines CW as any toxic chemical or its precursors *intended for purposes other than those not prohibited by the CWC* as well as munitions, devices or equipment specifically designed to be used with them.

⁶² Article 1, para. 5 and Article II, paras. 1, 2, 7, and 9 (d) of the CWC. The term 'riot-control agent' should be used with caution. As part of a NATO Partnership for Peace exercise near Riga, Latvia, in Sep. 1997, chloropicrin—a World War I lachrymator and asphyxiating agent—was used to simulate chemical contamination. NATO officials immediately halted the practice when, according to a statement from the Public Affairs Office of the US Army V Corps, it was learned that 'this riot-control compound was being used on the initiative of one station monitor'. Chloropicrin is listed in Schedule 3 of the CWC and can, according to Article II, para. 7, therefore not be considered as a riot-control agent. '8–11 September', *CBW Conventions Bulletin*, no. 38 (Dec. 1997), p. 26.

⁶³ For an in-depth discussion of the possible use of riot-control agents by armed forces, see Chayes, A. and Meselson, M., 'Proposed guidelines on the status of riot control agents and other toxic chemicals under the Chemical Weapons Convention', *Chemical Weapons Convention Bulletin*, no. 35 (Mar. 1997), pp. 13–18.

1957, when Danish military policemen of the United Nations Emergency Force (UNEF) deployed in the Gaza Strip following Israel's invasion of Egypt in 1956 were authorized to use 'tear-gas bombs' against rioting civilians attempting to take over the UN post.⁶⁴ Recent calls to equip forces with so-called non-lethal weapons, to which riot-control and other incapacitating agents belong, increase the possibility of the use of riot-control agents during interventions in local or regional wars or peacekeeping missions.⁶⁵

The key question concerns the authority to release such agents for use by troops (i.e., determining that a particular situation calls for law enforcement measures to be taken by peacekeeping troops). Two days before the 10 March 1957 incident the UNEF commander had issued a proclamation, approved by UN headquarters, which included a statement that UNEF had assumed responsibility for civil affairs in the Gaza Strip.⁶⁶ The increasingly common UN practice of contracting regional security organizations for peacekeeping missions further complicates the issue. Three sources of authority can be discerned in the SFOR incident mentioned above.

The first source of authority was the United Nations Security Council, which decided on the deployment and mandate of the peacekeeping forces. In Resolution 1088 (1996), the Security Council recognized 'the right of [SFOR] to take all necessary measures to defend itself from attack or threat of attack'.⁶⁷ However, SFOR did not receive responsibility for civil affairs: its tasks were to implement and ensure compliance with Annex 1-A of the Dayton Agreement, the Agreement on the Military Aspects of the Peace Settlement.⁶⁸ NATO was the second source of authority. NATO leads SFOR and was ultimately responsible for the choice of troops and equipment to be deployed in accordance with the UN mandate and the subordinate commands in charge of the daily management of operations. The third source of authority in the incident comprised the US president, armed forces and Congress, which were responsible for the type of weaponry with which the US forces were equipped and the operational guidance for its use.

US policy regarding the use of riot-control agents is defined in Executive Order 11850, 'Renunciation of certain uses in war of chemical herbicides and riot control agents', which was signed in the wake of the Viet Nam War by President Gerald Ford on 8 April 1975.⁶⁹ During the 1991 Persian Gulf War President George Bush invoked the executive order to authorize the use of

⁶⁴ Burns, E. L. M. (Lt-Gen.), *Between Arab and Israeli* (George G. Harrap & Co. Ltd: London, 1962), pp. 260–63.

⁶⁵ Lewer, N. and Schofield, S., 'Non-lethal weapons for UN military operations', *International Peacekeeping*, vol. 4, no. 3 (autumn 1997), pp. 71–93.

⁶⁶ Burns (note 64), p. 193.

⁶⁷ UN Security Council Resolution 1088 (1996), UN document S/RES/1088, 12 Dec. 1996, para. 20.

⁶⁸ The General Framework Agreement, Annex 1A, Agreement on the Military Aspects of the Peace Settlement, Article I, para. 1a, URL <<http://www.nato.int/ifor/gfa/gfa-an1a.htm>>, version current on 23 Jan. 1998. In addition, the UN Security Council created a UN civilian police force for Bosnia and Herzegovina, the International Police Task Force. UN Security Council Resolution 1035 (1995), UN document S/RES/1035, 21 Dec. 1995. See also chapter 2 in this volume.

⁶⁹ Document reprinted in McCullough, J. M. and Randall, B. (IV), *Chemical and Biological Warfare: Issues and Developments during 1975*, CRS document 7-30 SP (Library of Congress, Congressional Research Service: Washington, DC, 5 Jan. 1976), p. 76.

riot-control agents in search-and-rescue operations.⁷⁰ The US Senate agreed to ratify the CWC in April 1997, on the understanding that the convention does not restrict the use of riot-control agents, including use against combatants, in the following cases: (a) the conduct of peacetime military operations within an area of continuing armed conflict when the United States is not a party to the conflict (e.g., Bosnia, Rwanda and Somalia); (b) consensual peacekeeping operations when the use of force is authorized by the receiving state, including operations pursuant to Chapter VI of the UN Charter;⁷¹ and (c) peacekeeping operations in which force is authorized by the Security Council under Chapter VII of the UN Charter.⁷² The US Senate accepted the definition of a riot-control agent in Article II of the CWC but stated explicitly that the 'President shall take no measure, and prescribe no rule or regulation, which would alter or eliminate Executive Order 11850'.⁷³

The use of tear-gas in Brcko and Bijeljina was in conformity with the US Senate's ratification of the CWC. The lack of comment on the incident by either NATO or SFOR indicates that they, too, regarded the actions which were taken to be unexceptional.⁷⁴ However, the incident appears to fall in a grey zone between warfare and riot control that is inadequately covered by the CWC. It raises questions about the extent to which the actions taken can be considered as law enforcement or *domestic* riot control, the stipulation in the CWC, in view of the mandate and nationality of the SFOR troops. Questions can also be asked about the extent to which the lachrymator agents and their disseminating devices are of types (and quantities) consistent with purposes not prohibited by the convention.⁷⁵ If the CWC does prohibit these agents and disseminating devices, it would appear that the possessor state must declare and destroy them in order to meet its obligations under the convention. The OPCW must unambiguously clarify these issues before the practice of nations leads to acceptance of the *use* of lachrymators and other chemical incapacitants in armed conflict and adoption of the view that their *use* does not constitute chemical warfare.

⁷⁰ Perry Robinson, J. P., 'The chemical weapons of Desert Storm forces and the wider implication of tear gas and other incapacitants', ed. J. P. Zanders, *The 2nd Gulf War and the CBW Threat*, Proceedings of the 3rd Annual Conference on Chemical Warfare, Vredesonderzoek, Special issue (Interfacultair Overlegorgaan voor Vredesonderzoek van de Vrije Universiteit Brussel: Brussels, Nov. 1995), pp. 83-95.

⁷¹ Chapter VI of the UN Charter deals with the peaceful settlement of disputes.

⁷² Chapter VII of the UN Charter deals with action with respect to threats to peace, breaches of the peace and acts of aggression.

⁷³ US Senate, *Congressional Record*, 24 Apr. 1997, p. S3657.

⁷⁴ Aldinger, C., 'Two US troops injured in Bosnia operation', Reuters via Yahoo! News, URL <http://www.yahoo.com/headlines/970828/news/stories/bosnia_27.html>, version current on 28 Aug. 1997; 'Joint Press Conference', SFOR LANDCENT Transcript, 29 Aug. 1997, URL <<http://www.nato.int/ifor/landcent/t970829a.htm>>, version current on 4 Sep. 1997; and Dinmore, G., 'US unit repels Serb mob with tear gas', *Financial Times*, 2 Sep. 1997, p. 1.

⁷⁵ In one instance, tear-gas was dropped from helicopters.

III. Biological weapon disarmament

In December 1996 the Fourth Review Conference of the BTWC parties endorsed further intensification of the discussions on a legally binding protocol to the BTWC in its Ad Hoc Group.⁷⁶ The Ad Hoc Group was established by the 1994 Special Conference to consider verification measures and other proposals to strengthen the BTWC treaty regime. It held its 6th, 7th and 8th sessions on 3–21 March, 14 July–1 August and 15 September–3 October 1997, respectively. Friends of the Chair (FoC) were appointed to preside over particular topics in order to facilitate the negotiation process.

As requested at the 6th session, Ad Hoc Group chairman Tibor Tóth produced and circulated an initial version of a rolling text in June in preparation for the 7th session. The document provides a basic structure for the negotiations. However, it was presented ‘without prejudice to the positions of delegations on the issues under consideration in the Ad Hoc Group and does not imply agreement on the scope or content’.⁷⁷ The rolling text, which is now an annexe to the Procedural Report of the Ad Hoc Group and has more than doubled in size, reflects the discussions. The negotiators are still far from agreement on a final document. Much of the text contains bracketed language indicating the variant positions. Annexes A–E to the rolling text provide an indication of the types of programme and facility to be declared.

Some positions are diametrically opposed to others. Article II of the draft protocol seeks to define some of the terminology used in Article I of the BTWC including the basic terms ‘bacteriological (biological) and toxin weapons’ and ‘biological agents’. According to the majority view, any proposal to define these Article I terms would have the effect of amending the BTWC, which is contrary to the provisions of Article XI of the convention and also falls outside the mandate of the Ad Hoc Group. (The group’s mandate authorizes it to define only those terms necessary to devise an effective, legally binding protocol.) The USA, for example, has suggested that the fuzzy definitions of the BTWC will be defined by decisions on disputed issues.⁷⁸ The minority view, supported by Russia, holds that such definitions are indispensable for the purposes of a verification mechanism and do not have the effect of amending the convention.⁷⁹ The issue is delicate because the

⁷⁶Zanders, Eckstein and Hart (note 12), pp. 452–57.

⁷⁷Rolling Text of a Protocol to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Ad Hoc Group of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Ad Hoc Group document BWC/AD HOC GROUP/35/Rev.1, 29 July 1997.

⁷⁸Pearson, G. S., ‘Strengthening the Biological and Toxin Weapons Convention’, *CBW Conventions Bulletin*, no. 38 (Dec. 1997), p. 19; and Wright, S., ‘Cuba case tests treaty’, *Bulletin of the Atomic Scientists*, vol. 53, no. 6 (Nov./Dec. 1997), p. 19.

⁷⁹Procedural Report of the Ad Hoc Group of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Ad Hoc Group of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Ad Hoc Group document BWC/AD HOC GROUP/38, 6 Oct. 1997, Annex 1, p. 16, fn. 3.

outcome of the debate could affect the scope of the prohibition in Article I of the BTWC, which is based on the general purpose criterion.⁸⁰

The CWC contains a similar general purpose criterion, a definition of the term 'toxic chemical' (Article II) and a list of toxic chemicals grouped in three schedules depending on the level of threat which they pose to the purpose of the convention. Reporting requirements for parties and some types of inspection and export control mechanism in the CWC are based on the schedules. Concern exists that unlisted chemicals (including potential novel CW agents) may go undetected or unchallenged in practice unless there is firm evidence of a violation, despite the fact that these unlisted chemicals are covered by the general purpose criterion.

The mandate of the BTWC's Ad Hoc Group, however, calls for the definition of terms and objective criteria, including lists of biological and toxin agents and their threshold quantities, and of facilities, equipment and types of activity that should be covered by the protocol.⁸¹ The annexe to the draft protocol contains elaborate definitions, lists of and criteria for human, animal and plant pathogens and toxins, equipment and thresholds.⁸² The lists of and criteria for agents and toxins were originally presented in a 1996 FoC paper, and brackets have been introduced to address the concerns of some delegations.⁸³ The section on programmes and facilities remains blank.

The opposing positions on definitions highlight a fundamental difference between the BTWC and the CWC. The CWC deals mainly with mature technologies, substances and processes which have been available for decades and in some cases since the 19th century. The global expansion of the chemical industry has made them widely available throughout the world. Breakthroughs in the mid-1970s, when the BTWC entered into force, revolutionized the biological sciences.⁸⁴ Diverse biotechnological research establishments and industries have since emerged which operate at the leading edge of science and which, in the near future, may produce discoveries that are unimaginable today. At the First BTWC Review Conference, in 1980, the parties to the BTWC confirmed that the scope of the prohibition in Article I of the BTWC was sufficiently comprehensive to cover the relevant new scientific and technological developments of the 1970s. The Second Review Conference stated that the article also covered all relevant future developments.

This difference between the BTWC and the CWC also explains why the verification and inspection regimes of the CWC cannot simply be adapted and applied to the protocol to the BTWC. For non-military research

⁸⁰ In Article I the parties to the BTWC undertake never under any circumstances to develop, produce, stockpile or otherwise acquire or retain biological agents or toxins that cannot be justified for prophylactic, protective or other peaceful purposes.

⁸¹ Final Declaration of the Fourth Review Conference, BTWC Fourth Review Conference document BWC/CONF.IV/9, part II, p. 29.

⁸² Procedural Report . . . (note 79), Annex A, pp. 106–31.

⁸³ Procedural Report . . . (note 79), Annex A, p. 112, fn. 85. See also Zanders, Eckstein and Hart (note 12), p. 454.

⁸⁴ Bartfai, T., Lundin, S. J. and Rybeck, B., 'Benefits and threats of developments in biotechnology and genetic engineering', *SIPRI Yearbook 1993: World Armaments and Disarmament* (Oxford University Press: Oxford, 1993), pp. 293–305.

establishments and companies, investments in R&D are costly, and the returns—generated by relatively few commercially viable products in a highly competitive environment—cannot be expected for years or decades. Novel processes, techniques and products are key elements of innovative research, and the loss of proprietary information as a consequence of inspection routines could spell the ruin of an enterprise. Some representative organizations of the various branches of the biotechnology industry oppose an intrusive verification regime based on routine inspections, like that of the CWC. The Dutch association of biotechnology companies, Niaba, does not oppose inspections, taking the position that its members have nothing to hide and are already being inspected regularly by national authorities and the US Food and Drug Agency, following procedures with guarantees against the disclosure of proprietary information. The Dutch Foreign Ministry and the EU are also in favour of including inspections in the verification regime but do not want it to include such elaborate inspection routines as those in the CWC. The Dutch Ministry of Economic Affairs has conducted negotiations with the biotechnology industry with respect to challenge inspections on 24 hours' notice.⁸⁵ Some companies, however, prefer to wait for a decision on the matter by EuropaBio, a trade organization representing more than 600 European companies. EuropaBio recognizes the need for a verification regime but fears that on-site inspections and the removal of samples could threaten commercial confidentiality. The Association of Pharmaceutical Research and Manufacturers of America (PhRMA) wants to reduce the BW threat but opposes any protocol that does not fully protect confidential business information.⁸⁶

Article III, paragraph F of the draft protocol distinguishes between 'investigations' and 'visits'.⁸⁷ Investigations are intended to address concerns regarding non-compliance with Article I of the BTWC. Two types are currently under consideration: field and facility investigations. A field investigation would be carried out if there is a 'release of, or exposure of humans, animals or plants to microbial or other biological agents and toxins' which could be attributable to biological warfare-related activities. An alternative formulation, reflecting a minority view supported by Russia, proposes 'investigation of the alleged use of biological weapons', which is more restrictive because suspicious accidental outbreaks might be excluded from the procedure. A facility investigation would take place when concern exists that a particular facility is conducting prohibited activities.

The draft protocol contains elaborate language on the initiation, organization, conduct and reporting of non-compliance investigations and proposes

⁸⁵ Evenblij, M., 'Zoeken naar biologische wapens' [Searching for biological weapons], *De Volkskrant*, 5 Apr. 1997.

⁸⁶ 'PhRMA position on a compliance protocol to the Biological Weapons Convention', reproduced in Chevrier, M. I. *et al.*, *Biological Weapons Proliferation: Reasons for Concern, Courses of Action*, report no. 24 (Henry L. Stimson Center: Washington, DC, Jan. 1998), appendix 3, pp. 135–36; Butler, D., 'Talks start on policing bio-weapons ban', *Nature*, vol. 388 (24 July 1997), p. 317; and Ehrlich, J., 'US experts cite weakness of biological war treaty', *Defense News*, vol. 12, no. 34 (25–31 Aug. 1997), p. 6.

⁸⁷ Procedural Report . . . (note 79), pp. 32–36, 40–57.

procedures to guard against abusive requests for such investigations. In addition to field and facility investigations, Article III, paragraph F, III also mentions investigation of any other breach of the BTWC obligation as an alternative to facility investigations. In addition, transfers which are alleged to be in violation of Article III of the BTWC could be investigated.

Annex D of the draft protocol expands in detail on the procedures for investigations.⁸⁸ The language is heavily bracketed and some parts duplicate sections from Article III, paragraph F of the protocol. Annex D also contains sections which elaborate on the types of investigation, although the section on the investigation of illegal transfers remains blank, apart from its headings.⁸⁹ In order to guard against abuse, a request for an investigation must be submitted to a screening process. Currently, it is unclear whether the delegates will opt for a procedure whereby a significant majority of the representative body must formally approve the investigation (the 'green-light' procedure) or one in which the investigation will proceed unless a three-quarter majority of all members of the representative body votes against it (the 'red-light' procedure), in a process similar to that of the CWC.⁹⁰

The 'non-challenge visits' are verification routines other than those for non-compliance concerns. Article III, paragraph F, I defines five types of non-challenge visit: (a) random visits, which are a limited number of visits to declared facilities selected at random that would be carried out annually in cooperation with the visited party to confirm that the declarations are consistent with the facts; (b) ambiguity-related visits to declared facilities to resolve ambiguities in the declarations of parties; (c) clarification visits, which would be conducted to resolve ambiguity, uncertainty, anomaly or omission in the declaration obligations of a party and to promote accuracy and comprehensiveness in future declarations;⁹¹ (d) request visits, to help compile individual facility and national declarations and to further the cooperation and assistance envisaged by the protocol; and (e) voluntary visits to clarify ambiguities, which are to be based on arrangement and agreement between the party and the organization to be set up to implement the protocol with respect to the number, intensity, duration, timing and mode of visits to a particular facility.⁹²

The non-challenge visits remain controversial, and Annex B to the draft protocol, which should detail the procedures, is blank.⁹³ Some delegations fear that the efficiency of visits will be low and that the goals could be met by other measures. Visits would require additional national structures to provide organizational support and, consequently, would increase the cost of the

⁸⁸ Procedural Report . . . (note 79), Annex D, pp. 134–97.

⁸⁹ The issue of transfers is dealt with in chapter 9 in this volume.

⁹⁰ Procedural Report . . . (note 79), Article III, F, III (E), para. 20, p. 46. The alternatives are presented as bracketed language. In the green-light procedure proposal, the suggested majorities are 'at least a two-thirds majority' and 'a three-quarters majority' of either all members of the future organization or only the members 'present and voting'.

⁹¹ This category could include visits to undeclared facilities.

⁹² Procedural Report . . . (note 79), pp. 32–35.

⁹³ Procedural Report . . . (note 79), p. 132.

envisaged verification mechanism.⁹⁴ According to another view, a regime of non-challenge visits would include visits to facilities to review the observance of declaration obligations and thus would contribute to the overall effectiveness of the BTWC treaty regime.⁹⁵ As noted above, some biotechnology industries strongly oppose such visits, which is also one of the reasons why references to 'routine inspections', as in the CWC, are studiously avoided.

Implementation of the future BTWC protocol will inevitably require an organizational structure, and the rolling text contains some language to this effect. The shape and size of such an organization will depend on the ultimate verification regime, which, apart from different kinds of inspection, also consists of the declarations which the parties will be required to submit. The ideas which have been discussed include a new structure, a total or partial integration with the OPCW in The Hague or no new structure at all. The practice of the CWC verification regime and the experience of UNSCOM will undoubtedly have a major impact on the outcome of these discussions. At the 8th session of the Ad Hoc Group, the delegates agreed to intensify the negotiations.

IV. Chemical and biological warfare proliferation concerns

Threat and response

The CBW proliferation threat appraisal appears to be shifting from a quantitative to a qualitative threat. Until recently the threat level was essentially determined by the number of CBW-capable states, which was assumed to be rising rapidly. In 1997 proliferation analyses tended to converge on a figure of 'at least 20 countries' that 'already have or may be developing nuclear, biological, or chemical weapons, or their missile delivery systems'.⁹⁶ As the figure now comprises four categories of weapon, it is no longer possible to isolate the CBW threat assessment. The US Department of Defense (DOD) listed nine countries as having a CW programme in various stages of development and seven as having a BW programme in its annual *Proliferation: Threat and Response* report. However, some countries are conspicuously absent.⁹⁷

⁹⁴ Procedural Report . . . (note 79), p. 32, fn. 27. Random inspections are strongly opposed by Russia and resisted by, among others, Japan and the USA. Wright (note 78). According to one estimate, verifying compliance with the BTWC could cost up to \$100 million annually. Butler (note 86).

⁹⁵ Procedural Report . . . (note 79), p. 32, fn. 28. Proponents of this view include most European and South American countries, Australia, Canada, New Zealand and South Africa. Wright (note 78).

⁹⁶ Counterproliferation Program Review Committee, *Counterproliferation: Chemical Biological Defense*, CPRC Annual Report to Congress (1997), chapter 3, URL <<http://www.acq.osd.mil/cp/cprc97.htm>>, version current on 12 Mar. 1998.

⁹⁷ The countries are, notably, Egypt, Israel, South Korea and Taiwan. Compare with, e.g., Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks*, OTA-ISC-559 (US Government Printing Office: Washington, DC, Aug. 1993), pp. 65–66. As noted above, South Korea made a declaration under Article V of the CWC. US Department of Defense, *Proliferation: Threat and Response* (Department of Defense: Washington, DC, Nov. 1997), via DefenseLINK, URL <<http://www.defenselink.mil/pubs/prolif97/>>, version current on 12 Mar. 1998 lists the following countries as having a CW programme: China, India, Iran, Iraq, North Korea, Libya, Pakistan, Russia and Syria. The countries which it lists as having a BW programme are China, India, Iran, Iraq, North Korea, Pakistan and Russia. Libya is said to lack the scientific and technical base for a BW programme; Syria is said to possess the biotechnical infrastructure to support a BW programme.

The qualitative debate follows from the rapidly growing importance in the USA of counter-proliferation policies instead of sole reliance on export controls on strategic dual-use commodities targeted against certain countries to stem the spread of non-conventional weapons.⁹⁸ The principal goal of the counter-proliferation strategy is to ensure that military forces can operate effectively and decisively even if the enemy resorts to non-conventional weapons. The strategy supports the traditional non-proliferation policies but adds counterforce assets to plan and conduct interdiction operations if proliferation prevention and deterrence fail, active (e.g., anti-ballistic missile defences) and passive (e.g., protective suits, chemical and biological agent detectors and antidotes) defence capabilities, and targeted intelligence gathering.⁹⁹ In addition, civil emergency plans are set up in which specialized military personnel and municipal emergency services develop and test their rapid-response capability in case of terrorist attacks with CBW.¹⁰⁰ Arms control and disarmament—together with export control activities—are also subsumed under the proliferation prevention strategies, which may have a major impact on the debate on the non-security clauses of complex disarmament treaties such as the BTWC and CWC.

The US view of the reason why CBW proliferation poses a threat to the security of Western states, and the USA in particular, has been stated clearly: the possession of non-conventional weapons may enable a hostile, less powerful country to equalize the military balance with an advanced, well-equipped military power. The 1997 US Quadrennial Defense Review expressed the fear that 'U.S. dominance in the conventional military arena may encourage adversaries to use such asymmetric means to attack our forces and interests overseas and Americans at home' in order to exploit US vulnerabilities.¹⁰¹

Sensitivity to these vulnerabilities has resulted in major US R&D and arms acquisition efforts specifically to counter proliferation. For fiscal year (FY) 1998 the US DOD and Department of Energy (DOE) will invest \$5.4 billion, an increase of 15 per cent over FY 1997. The DOD's share is almost \$4.9 billion for FY 1998, an increase of \$0.6 billion over the previous fiscal year. The bulk of the money is allocated to air and missile defence (\$3.2 billion). Other major areas include: the detection and characterization of BW agents

⁹⁸ Following the analysis of Operation Desert Storm to liberate Kuwait in 1991, the 1992 Defense Science Board summer study produced the US Counterproliferation Initiative (CPI), which was formally announced in Dec. 1993. The CPI was actively promoted and now is broadly accepted by the appropriate government agencies, including the DOD and the Department of State. Larsen, J. A., *NATO Counterproliferation Policy: A Case Study in Alliance Politics*, INSS Occasional Paper no. 17 (USAF Institute for National Security Studies, US Air Force Academy: Colorado Springs, Colo., Nov. 1997), p. 15.

⁹⁹ Counterproliferation Program Review Committee (note 96), chapter 1, pp. 1.5–1.6; and United States Information Service, 'Asst. Defense Sec. Miller 3/5 testimony on proliferation', *Washington File* (United States Information Service, US Embassy: Stockholm, 6 Mar. 1997), URL <<http://www.usis.usemb.se/wireless/400/eur408.htm>>, version current on 6 Mar. 1997.

¹⁰⁰ US Department of Defense, *Domestic Preparedness Program in the Defense of Weapons of Mass Destruction*, Report to Congress, 1 May 1997, URL <<http://www.defenselink.mil/pubs/domestic/>>, version current on 17 Sep. 1997.

¹⁰¹ US Department of Defense, *Report of the Quadrennial Defense Review* (Department of Defense: Washington, DC, May 1997), section II, 'The global security environment', URL <<http://www.defenselink.mil/pubs/qdr/sec2.html>>, version current on 12 Mar. 1998.

(\$191.1 million); BW vaccine research, development, testing and evaluation (RDT&E) and production (\$64.5 million); maintenance of an NBC passive defence capability (\$364.9 million); support of Special Operations Forces and defence against paramilitary, covert delivery and terrorist NBC threats (\$151.1 million); and support of the inspection, monitoring and verification of arms control agreements (\$569.9 million).

The significance of these rising budgetary commitments must also be viewed in the light of the budgetary constraints faced by the DOD. The DOE requested \$489.4 million for FY 1998 to invest in non-proliferation activities, an increase of 19 per cent over FY 1997. At the request of the US Congress, the DOE has begun technology development efforts in detection, identification and characterization of CBW agents (\$41 million).¹⁰² For FY 1998, \$48.7 million was requested for DOD support of the Domestic Preparedness Program, which aims to enhance the capability of the federal, state and local response agencies to prevent and respond to domestic terrorist incidents involving NBC weapons.¹⁰³ After a computerized war-game was held which simulated a campaign on the Korean Peninsula and showed that there were serious deficiencies in the protection of US forces against CW, the US Secretary of Defense announced that an additional \$1 billion would be spent in FYs 1999–2003 to procure more CW personal protective equipment.¹⁰⁴ The level of concern in the United States is also reflected in the announcement by the DOD on 15 December 1997 of plans to vaccinate all US military personnel against anthrax, beginning in 1998.¹⁰⁵

After the Persian Gulf War, NATO also began to consider military options to counter proliferation. The two greatest threats were considered to be posed by non-conventional weapons against NATO forces engaged in regional conflicts and against NATO territory. In June 1996 the Senior Defence Group on Proliferation (DGP) presented its third report on *Capabilities and Shortfalls* to the North Atlantic Council (NAC).¹⁰⁶ It examined current NATO and national capabilities, identified deficiencies, and suggested areas for improvement and cooperation regarding proliferation. The report prioritized defence system requirements and recommended that NATO institutionalize the threat assessment process in future defence planning. In June 1997 NATO endorsed the 'Guidance for effective military operations in an NBC environment', which

¹⁰² Counterproliferation Program Review Committee (note 96), executive summary, p. ES-3, chapter 5, pp. 5–10, table 5.2.

¹⁰³ US Department of Defense (note 100).

¹⁰⁴ Starr, B., 'USA will add \$1b to chemical protection', *Jane's Defence Weekly*, vol. 27, no. 22 (4 June 1997), p. 19.

¹⁰⁵ 'Defense Department to start immunizing troops against anthrax', News Release no. 679-97, Office of Assistant Secretary of Defense (Public Affairs), Washington, DC, 15 Dec. 1997, URL <http://www.defenselink.mil/news/Dec1997/b12151997_bt679-97.html>, version current on 15 Dec. 1997.

¹⁰⁶ In 1994 NATO created 3 bodies to examine the proliferation threat and response: the DGP, the Senior Political-military Group on Proliferation (SGP) and the Joint Committee on Proliferation (JCP). The membership of the DGP is identical to that of the Nuclear Planning Group Staff Group, but the DGP designation is used when non-proliferation matters are discussed. The SGP and DGP were created to conduct parallel studies in a collegial atmosphere, but under US influence the latter body became the focus of NATO military efforts involving policy, force structure and acquisition. The JCP meets irregularly to report SGP and DGP findings to the NAC. Larsen (note 98), pp. 24–25.

comprises the plans for counter-proliferation doctrine and training exercises and planning guidance.¹⁰⁷ The NAC had also authorized the exceptional procedure of an accelerated phase of force proposals to be added to the 1996 Force Goals, which the NATO defence ministers approved in June 1996. A further analysis by the DGP of the progress NATO has made towards intensifying and expanding its defence efforts against proliferation risks is expected to be submitted to the spring 1998 meeting of the NAC in the Defence Ministers Session.¹⁰⁸

Many European partners which do not have overseas military commitments (Germany, in particular) emphasize diplomatic, economic and political measures to prevent proliferation. Consequently, the US term 'counterproliferation initiative' is politically unacceptable in NATO documents, but the alliance has adopted some of the core elements of the initiative, while maintaining a wide range of non-military measures to prevent, rather than counter, the proliferation of non-conventional weapons.¹⁰⁹ In the short term, NATO will rely on traditional forms of deterrence and focus on passive defence to protect troops in situations where it is feared that CBW may be used. In a short period the force planning, training and acquisition processes have been adapted to meet the proliferation threats.¹¹⁰

Allegations of CBW programmes

The reported continuation of CBW programmes in Russia continued to be a concern. For several years the existence of two nerve agents, A-232 and A-234, has been known in the West, and according to a leaked *Military Intelligence Digest* report 'the Russians can produce sizeable quantities of their new chemical agents within weeks to meet military requirements'.¹¹¹ The chemical structure of these compounds is not publicly known, but it is believed that neither the compounds nor their key precursors are included in the schedules of the CWC. Russia is also reported to have developed a genetically engineered variant of anthrax that is totally resistant to all known antibiotics.¹¹²

An officer of a Russian secret service reportedly defected to a Nordic country, believed to be Sweden, bringing with him a sample of an unnamed new

¹⁰⁷ Final communiqué of the ministerial meeting of the North Atlantic Council in Sintra, Portugal, 29 May 1997, Press release M-NAC-1(97)65, 29 May 1997.

¹⁰⁸ Final communiqué of the meeting of the North Atlantic Council in Defence Ministers Session, Press release M-NAC-D-2(97)149, 2 Dec. 1997.

¹⁰⁹ Larsen (note 98), pp. 56–57.

¹¹⁰ Final communiqué of the meeting of the North Atlantic Council in Defence Ministers Session, Press release M-NAC-D-1(97)71, 12 June 1997; and Final communiqué of the ministerial meetings of the Defence Planning Committee and the Nuclear Planning Group, Press release M-DPC/NPG-1(97)70, 12 June 1997.

¹¹¹ 'Secret report cites Russian capability to make chemical arms', Associated Press via Fox News, 5 Feb. 1997, URL <http://foxnews.com/news/wires/n_0205_49.sml>, version current on 5 Feb. 1997; and Ember, L., 'Russian chemical agent flouts treaty', *Chemical & Engineering News*, vol. 75, no. 11 (17 Mar. 1997), p. 22.

¹¹² Cullen, T. and Foss, C. F. (eds), *Jane's Land Based Air Defence 1997–98* (Jane's Information Group: Coulsdon, Surrey, 1997), p. 9.

type of CW agent.¹¹³ The agent, which is said to be extremely potent and to leave no trace because of its high volatility, was reportedly tested in Chechnya,¹¹⁴ which would account for some unexplained deaths there.

In early 1997 a South African newspaper published details from a summary of a secret 1992 report by General Pierre Steyn, who investigated the role of the so-called Third Force, an obscure apartheid-era group within the South African Government which was involved in assassinations, beatings and other similar actions in the violence that racked South Africa. The report, prepared for former President F. W. de Klerk, was reputed to be so sensitive that President Nelson Mandela chose not to make it public in order not to jeopardize the post-election transition. The document was given to the Truth and Reconciliation Commission¹¹⁵ in December 1996 for further investigation.¹¹⁶ A summary document, *The Steyn Portfolio*, reveals that the 7th Medical Battalion of the South African Defence Forces under Brigadier Wouter Basson was involved in a CBW programme called Project Jota, which planned to employ poison for murder and drugs for operational use. A chemical attack was conducted against Frelimo (Frente de Libertação de Moçambique, Front for the Liberation of Mozambique), which—according to the document—was confirmed by a British team from the Chemical and Biological Defence Establishment at Porton Down in the UK. This operation appears to have been part of the attempts to discredit the African National Congress (ANC).¹¹⁷ Basson founded and was head of South Africa's CBW programme, known as Project B or Project Coast in 1980–93 and revealed by de Klerk in 1994, and was also one of the South African CW experts linked by the US State Department in 1995 to the Libyan CW programme.¹¹⁸

Allegations of the presence of chemical weapons in the former Yugoslavia were detailed in a report published by the Human Rights Watch.¹¹⁹ The Middle East continued to be of major concern with respect to CBW proliferation.¹²⁰ Libya, however, apparently stopped construction of its CW plant at Tarhuna, according to a statement based on information from intelligence

¹¹³ Deutsche Presse Agentur, 'Russische Überläufer brachte neuartiges Giftgas in den Westen' [Russian defector brought new type of poison gas to the West], dispatch no. 3904, 12 Mar. 1997; and Private communication by the author with a Deutsche Presse Agentur journalist.

¹¹⁴ Claims of Russian chemical warfare in Chechnya were made in 1994 and 1995. Stock, T., Haug, M. and Radler, P., 'Chemical and biological weapon developments and arms control', *SIPRI Yearbook 1996* (note 57), p. 663.

¹¹⁵ The Truth and Reconciliation Commission is investigating abuses which occurred during the apartheid era. Its chairman is Archbishop Desmond Tutu.

¹¹⁶ 'Shocks from the Steyn Report', *Weekly Mail & Guardian*, 31 Jan. 1997, URL <<http://wn.apc.org/wmail/issues/970131/NEWS1.html>>, version current on 31 Jan. 1997.

¹¹⁷ *The Steyn Portfolio*, mimeographed, no date, pp. 7, 11.

¹¹⁸ Duke, L., 'Drug bust exposes S. African arms probes', *Washington Post*, 1 Feb. 1997, p. A15; and 'Poison gas secrets were sold to Libya', *Weekly Mail & Guardian*, 7 Feb. 1997, URL <<http://wn.apc.org/wmail/issues/970207/NEWS1.html>>, version current on 7 Feb. 1997. See also Leklem, E. and Boulden, L., 'Exorcising Project B: Pretoria probes its shady chemical past', *Jane's Intelligence Review*, vol. 9, no. 8 (Aug. 1997), pp. 372–75.

¹¹⁹ Human Rights Watch, 'Clouds of war: chemical weapons in the former Yugoslavia', *Human Rights Watch Arms Project*, vol. 9, no. 5 (Mar. 1997).

¹²⁰ Note 97.

agencies by John Holum, Director of the US Arms Control and Disarmament Agency.¹²¹

The Cuban allegation of biological warfare

On 30 June 1997 Cuba submitted a request to Russia, one of the three co-depositaries of the BTWC, to convene a formal consultative meeting to investigate an alleged US attack with BW agents in October 1996.¹²² This was the first time since the entry into force of the BTWC in 1975 that a party had formally requested the international community to investigate a breach of the convention. Cuba did not lodge a complaint with the UN Security Council under Article VI of the BTWC but invoked a procedure to strengthen the implementation of Article V which was adopted by the 1991 Third Review Conference of the BTWC. According to this procedure, the formal consultative meeting must be preceded by bilateral or other consultations among the states involved in the dispute. Following the submission of the request, the depositaries of the BTWC must convene a formal consultative meeting within 60 days of receipt of the request.¹²³

According to the allegation, a US anti-narcotics fumigation plane flying from Florida to Grand Cayman crossed Cuba with Cuban authorization on 21 October 1996 and was observed by a Cuban civilian aircraft to spray unknown substances intermittently. On 18 December the first signs appeared of a plague of *Thrips palmi*, a polyphagous insect pest. While Thysanoptera, to which thrips belong, live on plants, Cuba stated that this particular insect was indigenous to Asia and exotic to Cuban territory, although since 1985 its presence has been noted on several Caribbean islands. By January 1997 other parts of Cuba had also been affected.¹²⁴ In October the Cuban Government reported that 20 000 tonnes of produce had been lost to *thrips palmi*.¹²⁵

Cuba dismissed the US explanation that the pilot had used the smoke generator of his aircraft to signal his presence to the Cuban pilot and that the tanks of the sprinkling system had carried extra fuel for the long flight.¹²⁶ On 28 April, in a note to the UN Secretary-General, Cuba accused the USA of biological warfare.¹²⁷ In a letter, dated 27 June, Cuba formally rejected the US

¹²¹ United Press International, 'Libya halts chemical arms plant', 19 Mar. 1997, URL <<http://www.brook.edu/fp/projects/nucwcost/tarhunah.htm>>, version current on 8 Apr. 1997.

¹²² Prensa Latina (Havana), 0904 GMT, 1 July 1997, in 'Cuba: UN asked to investigate US use of bacteriological weapons', Foreign Broadcast Information Service, *Daily Report—Latin America (FBIS-LAT)*, FBIS-LAT-97-182, 1 July 1997.

¹²³ Final Document of the Third Review Conference of the Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Part II, Final Declaration, BTWC Third Review Conference document BWC/CONF.III/22, 27 Sep. 1991, Article V.

¹²⁴ Note verbale dated 28 April 1997 from the Permanent Mission of Cuba to the United Nations addressed to the Secretary-General, UN document A/52/128, 29 Apr. 1997.

¹²⁵ Radio Rebelde Network (Havana), 1800 GMT, 25 Oct. 1997, in 'Cuba: Lage stresses increased watch against biological warfare', FBIS-LAT-97-301, 28 Oct. 1997.

¹²⁶ The US version of events was presented on 6 May: 'Transcript: State Dept. noon briefing, May 6, 1997', *Washington File* (United States Information Service, US Embassy: Stockholm, 7 May 1997), URL <<http://www.sis.usemb.se/wireless/300/eur303.htm>>, version current on 7 May 1997.

¹²⁷ Note verbale . . . (note 124).

version of the incident.¹²⁸ The formal consultative meeting began in Geneva on 25 August in closed session but after three days of talks failed to resolve Cuba's claim because, according to its chairman, British ambassador Ian Soutar, 'it was not possible to draw a direct causal link' between the overflight and the outbreak.¹²⁹ As *thrips palmi* occur in the Dominican Republic, Florida, Haiti and Jamaica, the main unresolved question is whether the insect could have been introduced into Cuba in another way.¹³⁰ The meeting mandated Soutar to further investigate the allegation and prepare a report by 31 December 1997.¹³¹

The allegation and the subsequent procedure are further evidence of one of the BTWC's most significant weaknesses, the lack of a verification regime. The incident added urgency to the work of the Ad Hoc Group to complete negotiations on a verification protocol, as discussed above in section III.

Other events related to CBW proliferation

Iran was at the centre of several international incidents involving the shipment of controlled goods which, taken together, may indicate an active Iranian interest in the manufacture of chemical weapons. On 24 January 1997 two men were arrested in Portland, Oregon, for trying to ship impregnated alumina to Iran despite the US embargo against that country. Impregnated alumina is a catalyst used in the plastics and rubber industry but can also be used to produce phosphorus oxychloride, a precursor to nerve agents.¹³² In Tel Aviv a French-based Israeli businessman was charged in May 1997 with supplying components for CW, including mustard and nerve agents, to Iran.¹³³ Later in May, pursuant to the 1991 Chemical and Biological Weapons and Warfare Elimination Act,¹³⁴ the USA levied sanctions against three Chinese companies and five individuals for knowingly selling equipment and ingredients which can be used for the manufacture of CW agents to Iran. The offending companies, two of which are based in China and the third in Hong Kong, cannot import goods into the USA or buy US products for one year. Chinese authorities maintained that the companies had conducted normal business and that

¹²⁸ Letter dated 27 June 1997 from the Permanent Representative of Cuba to the United Nations addressed to the Secretary-General, UN document A/52/213, 27 June 1997.

¹²⁹ 'Cuba accuses US of biological attack', CNN Interactive, 25 Aug. 1997, URL <<http://www.cnn.com/WORLD/9708/25/biological.cuba.ap/index.html>>, version current on 25 Aug. 1997; and Higgins, A. G., 'Panel cannot resolve Cuban claim against US, sets plan for study', Fox News, 27 Aug. 1997, URL <http://foxnews.com/news/wires2/n_0827_170.sml>, version current on 27 Aug. 1997.

¹³⁰ Wright (note 78), p. 18. The insects can travel long distances on the wind.

¹³¹ Deen, T., 'Cuban pest strike claim tests UN Convention', *Jane's Defence Weekly*, vol. 28, no. 10 (10 Sep. 1997), p. 17.

¹³² Associated Press, 'O. C. man held in nerve gas shipment probe', *Los Angeles Times*, 25 Jan. 1997, p. A17.

¹³³ Marcus, R., 'Israeli indicted for helping Iran get chemical arms', *Jerusalem Post* (international edn), 17 May 1997, p. 24.

¹³⁴ Cornell Law School, Legal Information Institute, 'Sanctions against the use of chemical or biological weapons', URL <<http://www.law.cornell.edu/uscode/22/ch65.html>>, version current on 8 Apr. 1998.

China strictly enforces controls on the trade in such materials.¹³⁵ In July the Hong Kong Government closed a local subsidiary of a Chinese state arms manufacturer after alleging that the firm had supplied CW materials to Iran.¹³⁶

In October it became known that the Israeli secret service, Mossad, had attempted to assassinate a Hamas political leader, Khaled Meshal, in Amman by use of poison. When the operation went wrong and Meshal survived, the Israeli agents were imprisoned in Jordan, leading to a major crisis between Israel and Jordan. The poison reportedly leaves no traces and can therefore not be detected in an autopsy. The antidote is known only to Israeli experts, but King Hussein of Jordan forced Israel to provide it to treat the victim.¹³⁷

In an incident in April, which raised fear of BW terrorism in the USA, a package with a broken Petri dish and a note indicating that the Petri dish contained anthrax and plague was left outside the Washington headquarters of the Jewish organization B'nai B'rith. Tests proved negative for a variety of BW agents. During the incident, over 100 people were trapped inside the building for over eight hours, an event which highlighted the inadequacies of the then-existing emergency measures against CBW terrorism.¹³⁸

Israel operates a biological research laboratory, the Institute for Biological Research, in Nes Tsiona, which is known to conduct defence work. Marcus Klingberg, who was sentenced to an 18-year prison term in 1983 for passing BW secrets to the Soviet Union, was refused a request to be released on health grounds because, according to the court, he could possess information that 'if exposed could cause unimaginable damage to national security'.¹³⁹

V. UNSCOM developments

After the defeat of Iraq in the Persian Gulf War, the UN Security Council created UNSCOM to uncover Iraq's CBW and missile programmes;¹⁴⁰ to ensure destruction of its stockpiles, production facilities and other related installations; and to establish a long-term monitoring programme so that Iraq would be unable to acquire a new non-conventional weapon capability.

¹³⁵ 'US levies sanctions against Chinese companies', CNN Interactive, 22 May 1997, URL <<http://cnn.com/WORLD/9705/22/us.china/index.html>>, version current on 22 May 1997; US Information Service, 'US imposes CW sanctions against Chinese entities', 22 May 1997, URL <<gopher://198.80.36.82:70/0R28127762-28131581-range/archives/1997/pdq.97>>, version current on 22 May 1997; and Reuters, 'China slams US sanctions on Iran Trade', via Fox News, 23 May 1997, URL <<http://foxnews.com/news/052397/china2.sml>>, version current on 23 May 1997.

¹³⁶ Guyot, E., 'Hong Kong closes unit of Norinco in arms case', *Wall Street Journal Europe*, 16 July 1997, p. 2.

¹³⁷ Cowell, A., 'The daring attack that blew up in Israel's face', *New York Times*, 15 Oct. 1997, pp. A1, A8; and Tsur, B. and Bushinsky, J., 'Panel probes botched assassination', *Jerusalem Post* (international edn), 18 Oct. 1997, pp. 1-2. See also chapter 3 in this volume.

¹³⁸ 'FBI: leaking package at B'nai B'rith not life-threatening', CNN Interactive, 24 Apr. 1997, URL <<http://www.cnn.com/US/9704/24/bnai.brith.wrap/index.html>>, version current on 24 Apr. 1997; and 'FBI considers B'nai B'rith package as terrorism', Fox News, 25 Apr. 1997, URL <http://foxnews.com/news/wires/n_0425_122.sml>, version current on 25 Apr. 1997.

¹³⁹ 'Israeli germ war lab "no danger"', *Electronic Telegraph*, 20 Feb. 1997, URL <<http://www.telegraph.co.uk:80/>>, version current on 7 Jan. 1998.

¹⁴⁰ The International Atomic Energy Agency (IAEA) is responsible for uncovering and dismantling Iraq's nuclear weapon programme with the assistance and cooperation of UNSCOM.

Table 11.1. UNSCOM inspections, 1997

Type of inspection/date	Team
<i>Biological</i>	
2 Apr.–4 July	BG 9
9–14 May	BW 49/UNSCOM 184
16–20 May	BW 50/UNSCOM 187
13–19 June	CBW 4/UNSCOM 190
5 July–present [into 1998]	BG 10
7–21 July	BW 51/UNSCOM 189
26 July–4 Aug.	BW 52/UNSCOM 192
8–15 Aug.	BW 53/UNSCOM 193
21–25 Aug.	BW 54/UNSCOM 197
8–20 Sep.	BW 55/UNSCOM 199
9–13 Sep.	BW 56/UNSCOM 200
15 Oct.–21 Nov.	BG 11
22 Nov.–5 Jan. 1998	BG 12
<i>Chemical</i>	
16 Jan.–23 Apr.	CG 9
9–17 Apr.	CW 37/UNSCOM 186
24 Apr.–17 July	CG 10
5–14 May	CW 31/UNSCOM 153
13–19 June	CBW 4/UNSCOM 190
1–4 July	CW 38/UNSCOM 195
18 July–13 Oct.	CG 11
26–30 Aug.	CW 40/UNSCOM 198
10–20 Sep.	CW 42/UNSCOM 203
22–26 Sep.	CW 41/UNSCOM 202
29 Sep.–8 Oct.	CW 39/UNSCOM 196
14 Oct.	CG 12
<i>Ballistic missile</i>	
26 Feb.–4 May	MG 12
24 Mar.–3 Oct.	BM 50/UNSCOM 175
5 May–3 Aug.	MG 13
2–13 June	BM 56/UNSCOM 188
12–17 July	BM 57/UNSCOM 191
4 Aug.–14 Oct.	MG 14
11–16 Aug.	BM 58/UNSCOM 204
18–26 Aug.	BM 59/UNSCOM 205
5–19 Sep.	BM 60/UNSCOM 206
26 Sep.–4 Oct.	BM 61/UNSCOM 208
7–11 Oct.	MG 14A
15 Oct.–14 Jan. 1998	MG 15
10–19 Dec.	BM 64/UNSCOM 220
10–21 Dec.	MG 15A
27 Dec.–1 Jan. 1998	MG 15B
<i>Export/import</i>	
27 Mar.–6 June	EG–5
7 June–23 July	EG–6
24 July–5 Oct.	EG–7
6 Oct.–15 Jan. 1998	EG–8

Type of inspection/date	Team
<i>Concealment investigation missions</i>	
2–13 June	CIM 6/UNSCOM 194
19–24 Sep.	CIM 7/UNSCOM 201
26 Sep.–2 Oct.	CIM 8/UNSCOM 207
18–24 Dec.	CIM 9/UNSCOM 218
<i>Special missions to Baghdad</i>	
21–24 June	Deputy Executive Chairman's visit
21–25 July	Executive Chairman's visit
5–9 Sep.	Executive Chairman's visit
12–16 Dec.	Executive Chairman's visit

BG = Biological Monitoring Group, BM = ballistic missiles, BW = biological weapons, CBW = chemical and biological weapons, CIM = Concealment Investigation Mission, CG = Chemical Monitoring Group, CW = chemical weapons, EG = Export/Import Monitoring Group, MG = Missile Monitoring Group.

Source: Information provided by UNSCOM spokesman.

In July 1997 Swedish ambassador Rolf Ekéus stepped down as UNSCOM's Executive Chairman and was replaced by Australian ambassador Richard Butler. The long-term monitoring system, which includes an export/import control mechanism for dual-use goods, continued to function. More than 100 people, including approximately 20 scientists and specialists in nuclear physics, chemistry, biology and missile technology, now work at the Baghdad Monitoring and Verification Centre (BMVC) and carry out 'no-notice' inspections of relevant facilities. (Table 11.1 lists the inspections conducted by UNSCOM in Iraq in 1997.) Their work is supported by advanced sensors, detectors and field laboratories, and by approximately 150 cameras that monitor machines, production lines and missile test stands, among other things, and which beam real-time imagery to the BMVC.¹⁴¹

After more than six years UNSCOM is still unable to certify that the full extent of the Iraqi CBW programmes has been discovered. Inspectors have collected hard and circumstantial evidence which suggests that the programmes were either more advanced or wider in scope than previously thought. The 'full, final and complete' declarations submitted by Iraq in 1997 again proved to be of limited value.

Under UNSCOM supervision more than 53 000 chemical weapons were destroyed in 1991–94, including 38 537 filled and unfilled munitions, 690 tonnes of agents, more than 3000 tonnes of precursor chemicals for the manufacture of chemical warfare agents, and thousands of pieces of production equipment and analytical instruments. In 1996 UNSCOM found new evidence of CW production. Many analytical tools and precursor chemicals had been exempted from destruction in 1995 on the basis of Iraqi declarations of their past use or intended purpose, which proved to be false. Between August

¹⁴¹ Interview with Ambassador Rolf Ekéus in 'Ambassador Rolf Ekéus: leaving behind the UNSCOM legacy in Iraq', *Arms Control Today*, vol. 27, no. 4 (June/July 1997), p. 3.

and October 1997 UNSCOM supervised the destruction of 325 newly identified pieces of production equipment, 125 analytical instruments and 275 tonnes of precursor chemicals. In addition, 120 pieces of production equipment were declared by Iraq in August 1997.¹⁴²

However, no full account of the CW programme has been possible for a variety of reasons. First, Iraq removed CW, equipment and materials from the main site of the al-Muthanna State Establishment before the first UNSCOM inspection team arrived, and a full account of their destruction has not been forthcoming. Second, Iraq claims that it unilaterally destroyed 15 620 chemical munitions and 130 tonnes of CW agents, a fact and total that remain unverified. Third, in 1997 UNSCOM found fresh evidence that Iraq had developed a production capability for VX, the most toxic nerve agent in military arsenals. Iraq had obtained at least 750 tonnes of VX precursor chemicals and had produced a further 55 tonnes domestically. Iraq claimed that 460 tonnes were destroyed through aerial bombardment in the Gulf War and that it destroyed an additional 212 tonnes. The remainder was said to have been consumed in VX production attempts. However, UNSCOM was able to verify the destruction of only 155 of the 212 tonnes of VX precursor chemicals. (It also supervised the destruction of an additional 36 tonnes.)

Until 1995 Iraq denied that it had produced VX, and attempts were made to eliminate all traces of such activity.¹⁴³ The amount of VX precursor chemicals which Iraq appears to have possessed would have enabled it to produce up to 200 tonnes of VX. UNSCOM has determined that 3.9 tonnes of VX were actually produced in industrial plants.¹⁴⁴ Inspectors were reportedly about to uncover more evidence of the VX-production programme when a dispute began between Iraq and the UN Security Council in the autumn of 1997. According to Ekéus, UNSCOM possesses documentary evidence that Iraqi scientists have been ordered by the government to retain the capability to manufacture CW at short notice.¹⁴⁵

Iraq's BW programme was so secret that, according to Ekéus, even Iraq's Deputy Prime Minister Tariq Aziz was initially not aware of it.¹⁴⁶ Iraq has been least cooperative as regards its BW programme. According to an October 1997 UNSCOM report, Iraqi declarations are inaccurate and BW-related

¹⁴² Report of the Secretary-General on the activities of the Special Commission established by the Secretary-General pursuant to paragraph 9 (b) (i) of resolution 687 (1991), UN document S/1997/774, 6 Oct. 1997.

¹⁴³ Report of the Secretary-General . . . (note 142).

¹⁴⁴ United States Information Service, 'Fact sheet: Iraq's program of mass destruction' (United States Information Service, US Embassy: London, 19 Nov. 1997), URL <<http://www.usembassy.org.uk/midest26.html>>, version current on 19 Nov. 1997; Mann, P., 'Iraq's stratagem: conceal and comply', *Aviation Week & Space Technology*, vol. 147, no. 21 (24 Nov. 1997), p. 24; Deen, T., 'UNSCOM report exposes extent of Iraq's projects', *Jane's Defence Weekly*, vol. 28, no. 22 (3 Dec. 1997), p. 16; and United States Information Service, 'UNSCOM Chairman Butler report on visit to Baghdad', *Washington File* (United States Information Service, US Embassy: Stockholm, 26 Jan. 1998), URL <<http://www.usis.usemb.se/wireless/100/eur110.htm>>, version current on 26 Jan. 1998.

¹⁴⁵ '10 June', *CBW Conventions Bulletin*, no. 37 (Sep. 1997), p. 22.

¹⁴⁶ Address by Rolf Ekéus to a conference in Washington hosted by the Carnegie Endowment, as reported in '10 June', *CBW Conventions Bulletin*, no. 37 (Sep. 1997), p. 22; and Marshall, R., *Ekéus: Weapons of Mass Destruction of Higher Value to Iraq than Oil*, United States Information Agency, 10 June 1997.

activities are greatly under-reported. In some cases, Iraq reported that it had destroyed more munitions than the number which it had declared that it had produced.¹⁴⁷ According to some accounts, Iraq may have produced up to 10 billion doses of anthrax, botulinus toxin and aflatoxin.¹⁴⁸ The discovery that Iraq was researching aflatoxin, which is not a traditional BW agent, was surprising. Aflatoxin is a carcinogen whose effects would manifest themselves only after many years, and some Western experts have speculated that the Iraqi programme had genocidal goals.¹⁴⁹ If aflatoxin were used against the Kurds, for example, it would probably be impossible to prove biological warfare at the time the symptoms appeared. The Iraqi BW research programme focused on other agents, such as camel pox and gas gangrene, and included animal testing. A variety of delivery systems were developed and produced, including 155-mm artillery shells, 122-mm rockets, R400 aircraft bombs, warheads for the al-Hussein ballistic missile and an experimental spray tank converted from drop tanks, which would have held 2000 litres of anthrax.¹⁵⁰ The delivery systems faced serious developmental problems and may therefore have been ineffective. The BW programme remains a major cause of concern as Iraq can easily hide small quantities of freeze-dried organisms in a variety of locations and resurrect its research and production programme within a brief span of time.

As of October 1997, Iraq had also declared the production of 80 special warheads for the al Hussein ballistic missile: 50 for CW agents, 25 for BW agents and 5 for trials. These figures also differed from previous declarations. UNSCOM has evidence of the probable existence of additional special warheads. It can only confirm the destruction of 30 CW warheads under its supervision and some of the 45 other warheads which Iraq claims to have destroyed. No response was made to a request in September 1997 to document the destruction of the remainder.¹⁵¹

In 1997 the number of incidents between UNSCOM inspectors and Iraqi officials increased, leading to the unanimous adoption of UN Security Council Resolution 1115 on 21 June 1997. In the autumn a major crisis erupted when Iraq refused inspectors access to several facilities, including presidential sites (which comprise both buildings and the surrounding area), and objected to the nationality of some inspectors. Although escalation was initially prevented by Russian diplomatic efforts, the crisis flared up again in early 1998 following the submission of a negative report by Richard Butler to the UN Security Council after his January 1998 visit to Baghdad to resolve the crisis.¹⁵²

¹⁴⁷ Report of the Secretary-General . . . (note 142).

¹⁴⁸ United States Information Service, 'Fact sheet . . .' (note 144); and Mann (note 144).

¹⁴⁹ Discussion at the NATO Advanced Study Institute meeting, 'New Scientific and Technological Aspects of Verification of the Biological and Toxin Weapons Convention (BTWC)', Budapest, Hungary, 6–16 July 1997.

¹⁵⁰ United States Information Service, 'Fact sheet . . .' (note 144); and Mann (note 144).

¹⁵¹ Report of the Secretary-General . . . (note 142).

¹⁵² United States Information Service, 'UNSCOM Chairman Butler . . .' (note 144).

VI. The Gulf War illnesses

The so-called Gulf War Syndrome is a variable cluster of symptoms and physical conditions with different causes and to which individual susceptibility varies. The health complaints are mainly reported by British and US veterans of the war, but an increased incidence of symptoms and conditions has also been noted among veterans from Australia, Canada, the Czech Republic, Hungary, Kuwait, New Zealand and Norway, and among the civilian populations of Iraq, Kuwait and Saudi Arabia.¹⁵³ The Danish Army has also commissioned an epidemiological study to investigate the health problems which exist among nearly one-half of the 840 Danish soldiers and civilians who served in the Gulf War.¹⁵⁴ The ailments include influenza-like symptoms, chronic fatigue, rashes, joint and muscle pain, headaches, memory loss, reproductive problems, depression, loss of concentration and gastrointestinal problems.¹⁵⁵ While official sources in the UK and the USA maintained that post-traumatic stress disorder (PTSD) was the main source of the various symptoms, there is growing recognition that exposure to CBW agents, depleted uranium, oil-well fire smoke, pesticides, petroleum products, the experimental nerve agent pre-treatment pyridostigmine bromide (PB) or vaccines, alone or in combination, may be the real cause of the wide range of health disorders.¹⁵⁶ French troops serving in the Gulf War, however, do not complain of such symptoms. It is noteworthy that, according to Colonel Françoise Rota, a French medical officer in the Gulf War, French troops did not use any of the chemical and biological agent pre-treatments administered to British and US personnel or the organophosphate spray which was used to control insect pest populations.¹⁵⁷

In 1997 attention increasingly focused on the exposure of the veterans to toxic chemical substances following the disclosure in 1996 that the demolition of a munition bunker containing 8.5 tonnes of nerve agent at Khamisiyah in southern Iraq may have contaminated tens of thousands of US troops. Before this admission, the US DOD categorically denied that any US or other coalition soldiers had been exposed directly or indirectly to CBW agents. This was despite the fact that during the military operations in January and February 1991 the chemical alarms went off repeatedly. Although many of these alarms were false, NBC specialists with sophisticated detection equipment also confirmed the presence of CW agents in southern Iraq and Kuwait both during

¹⁵³ Tucker, J. B., *Chemical/Biological Weapons Exposures and Gulf War Illness*, Report to the Subcommittee on Human Resources and Intergovernmental Relations, Committee on Government Reform and Oversight, US House of Representatives, 29 Jan. 1996.

¹⁵⁴ '8 January', *Chemical Weapons Convention Bulletin*, no. 35 (Mar. 1997), p. 33.

¹⁵⁵ *Gulf War Veterans' Illnesses: VA, DoD Continue to Resist Strong Evidence Linking Toxic Causes to Chronic Health Effects*, Second Report by the Committee on Government Reform and Oversight together with additional views, US House of Representatives, 7 Nov. 1997 (US Government Printing Office: Washington, DC, 1997), pp. 6–7.

¹⁵⁶ US General Accounting Office, *Gulf War Illnesses: Improved Monitoring of Clinical Progress and Reexamination of Research Emphasis are Needed*, GAO/NSIA-9-163 (General Accounting Office: Washington, DC, June 1997), appendix IV, pp. 54–64.

¹⁵⁷ 'Darkness at noon', *The Economist*, 11 Jan. 1997, p. 84.

and after the fighting.¹⁵⁸ Coalition troops may have been exposed to low levels of CW agents as a consequence of the chemical fallout from the aerial bombardment of Iraqi CW depots, the demolition of munition depots containing CW after the cease-fire, and the sporadic and uncoordinated Iraqi use of CW in the ground campaign.¹⁵⁹ The DOD's position is based on a lack of evidence of mass incidents of morbidity and mortality. Consequently, funding for research on the health effects of such exposure, especially at low levels, has been refused.¹⁶⁰ In the 1980s the US Air Force conducted animal studies of low-level exposure because of concern that some personnel, such as bomb loaders, might have to work in a contaminated environment.¹⁶¹ The delayed toxic effects of various CW agents have been described in the medical literature since World War I.¹⁶²

British and US troops, in particular, were required to take experimental drugs and vaccines to counter the effect of potential exposure to CBW agents in the Gulf War and these may have caused some of the reported symptoms. The anti-nerve agent pyridostigmine bromide, which was administered in tablet form, has been studied for its possible connection with the complaints of ill health. Like nerve agents and organophosphate pesticides, PB inhibits the functioning of the enzyme acetylcholinesterase (AChE), which leads to nerve and muscle degeneration moments after a single dose and worsens with multiple doses.¹⁶³ The PB tablets therefore, according to some claims, can have masked the acute effects of chemical exposure and contributed to the conclusion by the DOD that no such exposure occurred.¹⁶⁴ Laboratory research has suggested that exposure to PB, the insecticide permethrin and the insect repellent diethyltoluamide (DEET)—all of which were used routinely in the Gulf War theatre—may have caused increased neurotoxicity. Since the war it has also been established that with the onset of stress PB can leak through the blood/brain barrier, increasing its ability to cause damage to the central nervous system.¹⁶⁵ According to testimony before a US congressional committee, the US Army's chemical warfare research centre in Aberdeen,

¹⁵⁸ See various testimonies in *Persian Gulf Veterans' Illnesses*, Hearings before the Subcommittee on Human Resources and Intergovernmental Relations of the Committee on Government Reform and Oversight, House of Representatives, 104th Congress, 2nd session, 10–11 Dec. 1996 (US Government Printing Office: Washington, DC, 1997).

¹⁵⁹ Tucker, J. B., 'Low-level chemical weapons exposures during the 1991 Persian Gulf War', Prepared statement before the Subcommittee on Human Resources, Committee on Government Reform and Oversight, US House of Representatives, 24 Apr. 1997, p. 2; and US General Accounting Office (note 156), p. 62.

¹⁶⁰ US General Accounting Office (note 156), pp. 62, 64.

¹⁶¹ The results are summarized in Hartgraves, S. L. and Murphy, M. R., 'Behavioral effects of low-dose nerve agents', ed. S. M. Somani, *Chemical Warfare Agents* (Academic Press: San Diego, Calif., 1992), pp. 125–54.

¹⁶² Lohs, Kh., SIPRI, *Delayed Toxic Effects of Chemical Warfare Agents* (Almqvist & Wiksell: Stockholm, 1975). Also available at the SIPRI CBW Project Internet site, URL <<http://www.sipri.se/cbw/cbw-info.html>>.

¹⁶³ *Gulf War Veterans' Illnesses* (note 155), p. 33. Unlike the nerve agents, PB slowly restores the functioning of the AChE. Pre-treatment is intended to block a percentage of the action of the AChE before exposure to the nerve agent. The blocked AChE cannot then be destroyed by the nerve agent and is available for recovery from nerve agent poisoning.

¹⁶⁴ *Gulf War Veterans' Illnesses* (note 155), pp. 38, 86.

¹⁶⁵ *Gulf War Veterans' Illnesses* (note 155), pp. 33–34, 87.

Maryland, established in the early 1980s that: '1) PB would be harmful in healthy individuals; 2) PB was worthless, even counterproductive, as a protectant against chemical warfare; and 3) PB was more toxic than sub-lethal doses of chemical warfare agents'.¹⁶⁶ It is therefore surprising that in December 1990 the Food and Drug Administration agreed to grant a waiver to the DOD allowing the military to issue the experimental drug PB without the prior informed consent of the soldiers.

In the UK an estimated 1800 soldiers suffer from Gulf War-related illnesses. On the basis of the revised Pentagon data on the destruction of the munition dump at Khamisiyah, the British Ministry of Defence stated at the end of July 1997 that British units may also have been exposed to minute amounts of chemical agents.¹⁶⁷ This news followed the admission in December 1996 by Conservative Nicholas Soames, then Armed Forces Minister, that troops with no training and no protective clothing had been told during the Gulf War to spray camps with the organophosphate pesticides Fenitrothion and Diazanone, which are not used for public hygiene.¹⁶⁸ The British Government had also approved large-scale vaccination of troops against CBW agents but was unaware of concerns raised by the Department of Health in late 1990 as it did not receive the relevant document until 7 April 1997. A programme has been set up to investigate the interaction of vaccines and anti-nerve agent tablets as a possible cause of the Gulf War Syndrome. Soldiers serving on land, for example, were given simultaneous inoculations against anthrax and whooping cough, the latter having been administered as an adjuvant to enhance the anthrax vaccine. According to Armed Forces Minister John Reid, one of the reasons for the new focus was that during the Gulf War the commander of the French forces had refused 'to allow any of his men to have the vaccines or any of the anti-nerve agent tablets'.¹⁶⁹

VII. Conclusions

Two contradictory forces regarding the future of chemical and biological weapons seem to have been at work in 1997. On the one hand, the international norms against their possession and use were strengthened with the entry into force of the Chemical Weapons Convention and the intensification of the negotiations to create an effective, equitable and verifiable verification regime for the Biological and Toxin Weapons Convention. On the other hand, there is a growing fear that states or sub-state actors might gain disproportionate military advantage from violating or failing to adhere to these norms by

¹⁶⁶ *Gulf War Veterans' Illnesses* (note 155), pp. 33, 87–88, 110–11.

¹⁶⁷ Associated Press via CNN Interactive, 'British as well as US troops were exposed to poison gas in Iraq', 30 July 1997, URL <<http://www.cnn.com/WORLD/meast/9707/29/AP000531.ap.html>>, version current on 30 July 1997.

¹⁶⁸ Zanders, Eckstein, and Hart (note 12), p. 466; and Burrell, I., 'Veterans ignored in Whitehall inquiry', *The Independent*, 10 Mar. 1997, p. 5.

¹⁶⁹ 'Gulf veterans: new care plans', *Survey of Current Affairs*, vol. 27, no. 5 (1997), p. 167; Bellamy, C., 'Gulf War syndrome research stepped up', *The Independent*, 15 July 1997, p. 9; and Fairhall, D., 'New Gulf syndrome inquiry', *The Guardian*, 15 July 1997, p. 4.

having such weapons ready for use without fear of retaliation in kind. In particular, the difficulties UNSCOM experiences in accounting for and eliminating Iraq's CBW capabilities, despite operating under the most intrusive inspection mandate ever, appear to challenge the belief in the effectiveness of the verification measures of arms control and disarmament regimes. In addition, the fact that more British and US soldiers have died after than during the Persian Gulf War as a consequence of various ailments, which are increasingly being attributed to exposure to a variety of toxic chemicals, seems to underscore the fear that even the limited CBW capabilities of a small power can inflict long-term damage on the best-equipped forces. The Gulf War experience has led the Western powers to launch major R&D and acquisition programmes to counter these threats. While the chances of a war or a major terrorist attack in which CBW are used remain relatively low, the consequences of a lack of preparation are extremely serious and at present few Western governments feel that they can safely neglect the issue. However, the institutionalization of policy, military and emergency planning and acquisition across many governmental bodies also perpetuates and enhances the threat perception as many organizations inside and outside government, including research institutes and commercial companies, develop a vested interest in the continuation of the situation in which the use of CBW is viewed as a major threat.

The changing environment in which a treaty must operate can quickly erode the degree of international consensus at a given moment regarding a particular prohibition. For the future of the CWC disarmament regime, for instance, it is imperative that the convention achieves universal adherence as soon as possible, that parties provide complete and accurate declarations, and that certain grey areas are clarified. Similarly, greater public transparency on the part of governments regarding past CW programmes should alleviate international proliferation concerns. Speedy international agreement on verification and confidence-building measures for the BTWC is imperative before biotechnological developments turn biological weapons into controllable battlefield weapons. The manner in which the international community meets these challenges in the near future will determine the strength and future of the CBW disarmament regimes.