

Strengthening the biological and toxin weapons convention : countering the threat from biological weapons / presented to Parliament by the Secretary of State for Foreign and Commonwealth Affairs by Command of Her Majesty, April 2002.

Contributors

Great Britain. Foreign and Commonwealth Office.

Publication/Creation

London : Stationary Office, 2002.

Persistent URL

<https://wellcomecollection.org/works/dseepdmk>

License and attribution

You have permission to make copies of this work under an Open Government license.

This licence permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

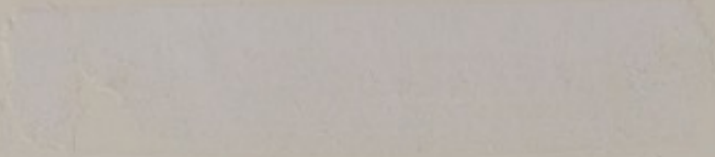
Image source should be attributed as specified in the full catalogue record. If no source is given the image should be attributed to Wellcome Collection.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>



Strengthening the Biological and
Toxin Weapons Convention:
Countering the Threat from Biological
Weapons



LIBRARY
General Collections
P

6489

EXECUTIVE SUMMARY



There has been considerable progress in the implementation of the 1972 Biological and Toxin Weapons Convention since it was first signed in 1972. This document is a report of the progress made in the implementation of the Convention since 1972. It is intended to provide a comprehensive overview of the Convention's implementation and to identify areas for further action.

The 1972 Biological and Toxin Weapons Convention is a landmark agreement in the history of disarmament. It is the only international treaty that has been signed by all 117 States Parties. The Convention's objective is to prevent the development, production, stockpiling, acquisition, retention, use, or transfer of biological and toxin weapons.

- Strengthening the Convention's implementation through the work of the Convention's organs and national authorities.
- Improving the Convention's effectiveness through the work of the Convention's organs and national authorities.
- National authorities' implementation of the Convention's provisions.

Strengthening the Biological and Toxin Weapons Convention: Countering the Threat from Biological Weapons

WELLCOME LIBRARY
INFORMATION SERVICE
16 MAY 2002
JJW Str

*Presented to Parliament
by the Secretary of State for Foreign and Commonwealth Affairs
By Command of Her Majesty
April 2002*



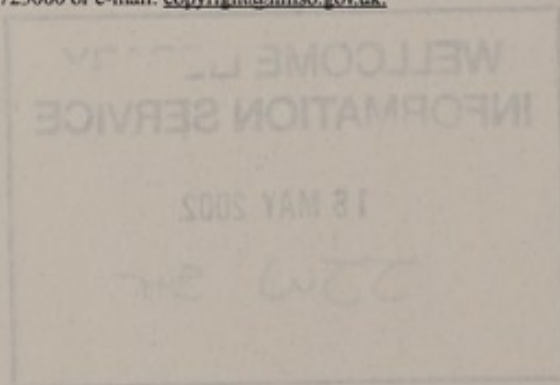


Strengthening the Biological and
Toxin Environment

© Crown Copyright 2002

The text in this document (excluding the Royal Arms and departmental logos) may be reproduced free of charge in any format or medium providing that it is reproduced accurately and not used in a misleading context. The material must be acknowledged as Crown copyright and the title of the document specified.

Any enquiries relating to the copyright in this document should be addressed to The Licensing Division, HMSO, St. Clements House, 2-16 Colegate, Norwich NR3 1BQ. Fax: 01603-723000 or e-mail: copyright@hmso.gov.uk.



Presented to Parliament
in the Session of 2001-02
by Command of Her Majesty
April 2002

STRENGTHENING THE BIOLOGICAL AND TOXIN WEAPONS CONVENTION: COUNTERING THE THREAT FROM BIOLOGICAL WEAPONS

EXECUTIVE SUMMARY

Work has been underway for many years to develop measures to make the 1972 Biological and Toxin Weapons Convention more effective. The failure last year of the States Parties to agree on the text of a Protocol to the Convention was undoubtedly a disappointment. Despite this outcome it is still essential to find ways in which the Convention can be strengthened. This Green Paper explains why such efforts must continue (the proliferation of BW capabilities, advances in technology which could be misused and the terrorist threat). The paper identifies the following possible measures for consideration:

- **investigations** into non-compliance with the Convention (alleged use of BW, misuse of facilities and suspicious outbreaks of disease).
- **assistance** in the event, or threat, of use of BW.
- **national criminal legislation** and extradition procedures: in those cases where they have not already done so, States Parties should pass national criminal legislation translating the prohibitions in the Convention into domestic law.
- **Scientific Advisory Panel:** in view of the dramatic pace of technical change in the life sciences as described here, an open ended body of government and non-government scientists should meet every one or two years to review the rate of change and assess their implications for the Convention and measures being taken to strengthen it.
- **revised Confidence Building Measures (CBMs):** existing CBMs should be revisited to see whether there is scope for improving and expanding their breadth and scope. Expanded CBMs might include more detailed voluntary exchanges on the level of information as well as voluntary visits to be agreed between participating States Parties to facilities notified under the existing or revised CBMs, or indeed to any facilities that it was agreed could be subject to visits, reciprocal or otherwise.
- **a new Convention on Physical Protection of dangerous pathogens:** consideration should be given to the feasibility and desirability of establishing a new international agreement that would set standards for effective physical protection of dangerous pathogens held or worked upon in academic, government, industrial or research laboratories.
- **a new Convention on Criminalisation of CBW:** there are already proposals, developed initially in the academic community, for a Convention that introduces criminal responsibility for any individual indicted for violating the prohibitions in the Biological and Toxin Weapons Convention or the Chemical Weapons Convention.
- **increased efforts on disease surveillance,** detection and diagnosis and countering infectious disease generally: this would be done through existing national and/or international channels.
- **codes of conduct:** such codes would be developed by academic and professional bodies to lay out standards for work relevant to the prohibitions of the Convention.
- **promotion of universal membership** of the BTWC.
- **Withdrawal of reservations to the 1925 Geneva Protocol:** States Parties to the Convention should be encouraged to withdraw any existing reservations they made on ratification or accession to the Convention regarding circumstances under which they reserved the right to use BW and CW.

The paper discusses UK priorities and the next steps ahead of the reconvened BTWC Fifth Review Conference and invites comments on the proposals outlined here and on any other ideas for strengthening the Convention and seeks views from MPs, NGOs, other organisations and individuals with an interest in this subject.

I. INTRODUCTION

1. The history of warfare is amongst other things a history of science and the law. Every step change in science has opened up new and more terrifying methods of killing and incapacitating; and in turn made more urgent that these methods be subject to internationally enforceable control.
2. Chemical and biological warfare became possible in the modern era as their parent sciences and industries developed: the knowledge and capabilities provided the wherewithal for practical and effective weapons. Mustard gas and other chemical warfare agents caused, according to some estimates, almost 1.3 million fatal and non-fatal casualties during the First World War.¹ In more recent times Iraqi use of CW against Iran caused extensive casualties and inflicted appalling suffering on those who survived. According to the Iranian Organisation of Veteran Affairs, some 34,000 Iranian military and civilian personnel are still suffering from the long-term effects of CW, particularly mustard gas.² The Imperial Japanese Army's experimentation with, and use of, BW in China in the 1930s and 40s is a grim reminder that the perversion of microbiology has also had its place in the annals of science and warfare.
3. The first significant attempts to contain CBW came in the post First World War disarmament negotiations in the 1920s. Although there were ambitious schemes for complete disarmament, such ambitions came to naught and instead more limited agreements were concluded. Amongst these was the *1925 Geneva Protocol* which was in effect a ban on the first use of chemical or biological weapons. Many signatories to the Protocol still reserved the right to retaliate in kind if first attacked with such weapons. In the years following the Second World War CBW disarmament was generally wrapped up in grand schemes for General and Complete Disarmament, which came to nothing, not least because of the Cold War. In the late 1960s the UK proposed that it would be better to focus efforts on a separate agreement on biological weapons, leaving for later what was thought at the time to be the more difficult question of a prohibition on chemical weapons.
4. A separate Convention was agreed in 1971 and opened for signature in 1972; this was the *Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction* – the BTWC for short. It entered into force in March 1975.

BIOLOGICAL AND CHEMICAL WEAPONS

A biological warfare agent is a living micro-organism or a toxin. Many pathogenic (disease producing) microorganisms are bacteria or viruses. Fungal organisms are also potential agents. Toxins, although not living, are produced by certain species of microorganisms, plants or animals. Many biological agents are easily manufactured; a single 100-litre fermenter can be used to produce ten thousand million infectious doses of anthrax bacteria within a week.

A biological weapon is simply the agent combined with a means of dispersing it. Delivery systems range from cluster bombs and missile warheads to a variety of simple spray devices which may be mounted on aircraft, unmanned aerial vehicles, land vehicles and ships. Portable devices may also be employed and deployed in clandestine ways. Such systems can be used to attack humans, animals and plants.

A Chemical Weapons Convention was eventually agreed in 1992, opened for signature in January 1993 and entered into force in April 1997. The CWC contains extensive verification provisions including routine inspection for certain types of chemical industry facilities as well as challenge inspections of any locations suspected of being used to produce or storing CW; there are also provisions to investigate alleged use of CW. A chemical agent is a compound which, when suitably disseminated, produces incapacitating, damaging or lethal effects on people, animals or plants. People are vulnerable through inhalation, ingestion or absorption through the skin. Most chemical agents are liquid, not gas. The CWC also applies to toxins, but does not apply to herbicides.

¹ THE PROBLEM OF CHEMICAL AND BIOLOGICAL WARFARE. A study of the historical, technical, military, legal and political aspects of CBW, and possible disarmament measures. Volume I The Rise of CB Weapons, SIPRI, Almquist and Wiksell, Stockholm 1971 Table 2.5. page 129

² THE CBW CONVENTIONS BULLETIN. Quarterly Journal of the Harvard Sussex Program on CBW Armament and Arms Limitation, December 2001 page 32 News Chronology 31 August

5. Efforts have been underway since 1980 to find ways of strengthening the BTWC, as it has been unable to prevent a small number of countries from developing or seeking to develop biological weapons (see section II). The potential for research developments in the life sciences to be misused, the spectre of international terrorism and the recent anthrax attacks in the US have all highlighted the seriousness of the potential threat to international security from biological weapons proliferation and the need for an urgent and focussed international response.

6. **The objective of this Green Paper is to outline the nature of the threat posed to international security by BW, review the arms control efforts to which the UK has contributed over the last decades to combat this threat, and to describe some possible measures that the UK might pursue to strengthen the BTWC and counter the threat from BW.**

The UK's overall response to the CBW problem

7. Arms control is but one element in the UK's strategy for dealing with the threat posed by CBW. A detailed description of the UK's overall response to the CBW problem was given in 1999 in the Ministry of Defence paper entitled *Defending Against the Threat from Biological and Chemical Weapons*. The box below outlines the four "pillars" of that approach: arms control, preventing supply, deterring use and defending against use. Such an approach remains at the heart of our policy.

UK POLICY ON MANAGING THE RISKS POSED BY CBW

Arms Control

The three principal international and legally binding instruments here are the 1925 Geneva Protocol, which prohibits the use of CBW (although many of its signatories still retain the right of retaliation in kind if attacked with CBW), the 1972 BTWC and the 1993 CWC.

Preventing Supply

Disarmament agreements in isolation cannot ensure that a determined proliferator cannot in practice acquire by clandestine means the technology and materials necessary to produce biological weapons and their means of delivery. Whilst both the BTWC and the CWC oblige their members not to assist anyone to acquire such items for offensive programmes, the UK and other key potential supplier states have been co-ordinating export control since 1985 through the Australia Group. These efforts are intended to prevent the supply of biological agents, chemicals and associated dual-use technologies and equipment which could be used in biological and chemical weapons programmes.

Deterring use

Even a combination of arms control and export controls have proved insufficient to prevent CBW proliferation. The UK believes that it is also essential to deter CBW use by assuring a potential aggressor of three related outcomes: CBW use will not be allowed to secure political or military advantage; it will, on the contrary, invite a proportionately serious response; and those at every level responsible for any breach of international law relating to the use of such weapons will be held personally accountable.

Defending against use

In the event that deterrence were to fail, it is essential to be prepared. Therefore possession of an effective range of defensive capabilities (such as detection and identification, warning and reporting, physical protection, hazard management and medical counter-measures and support) enhances the other three pillars of the UK's approach by helping to make clear to a potential aggressor that the threatened or actual use of CBW will not limit UK political options, or determine the outcome of a conflict.

8. The main focus of this paper, however, is on the arms control pillar and on the BTWC itself, as it represents the legal centre piece of international co-operative efforts to counter BW and has been the focal point of recent international co-operative efforts.

The role of arms control

9. Last year the culmination of the most recent international work on measures to strengthen the BTWC, a draft Protocol, was presented to the countries which have been engaged in negotiations in Geneva since 1995. It contained a range of proposed measures such as declarations of relevant facilities, visits to these sites, investigations in cases of alleged non-compliance and measures to promote scientific and technological cooperation. The Ad Hoc Group of States Parties (AHG) – the international body negotiating the Protocol – was unable to reach consensus on this text. Since its entry into force the BTWC has been periodically reviewed. The Fifth Review Conference was held in November/December 2001, but was unable to agree a future programme of work to continue the efforts to strengthen the Convention.

10. Notwithstanding the failure of the States Parties to reach agreement, the UK considers that efforts to strengthen the Convention must continue, and that a range of international and national measures can and should be taken, both to strengthen the Convention and to counter the threat from BW. Some could be pursued at the national level only. Potential measures identified by the UK, other States Parties to the BTWC and academics, which might be pursued in subsequent international discussions, are itemised in paragraph 47 below. Such measures are likely to be more effective if they follow uniform standards contained in an international agreement that can be universally and demonstrably applied.

11. The Government would welcome views on these possible measures in advance of the forthcoming reconvening of the Fifth BTWC Review Conference on 11 November 2002. Some are arguably more directly relevant to efforts to strengthen the BTWC (such as investigations), whilst others (professional codes for example) may affect the Convention only indirectly.

II. KEY ASPECTS OF THE PROBLEM

Offensive BW programmes – lessons from recent history

12. The lessons from the recent past are unambiguous. Both the former Soviet Union and Iraq pursued major clandestine offensive BW programmes concealed both within government and ostensibly civil and academic facilities such as vaccine and other pharmaceutical plants. Such misuse of “dual-use” knowledge, facilities and technologies remains a risk. (Dual-use applies to activities, materials, equipment, technology and expertise that are capable of being used for either peaceful or hostile purposes.)

13. Iraq’s BW programme remains a key concern as long as UNMOVIC (UNSCOM’s successor organisation) is prevented from beginning its work as required by UN Security Council Resolution 1284 of 17 December 1999. No inspections have been conducted since Iraq expelled UNSCOM in December 1998. Earlier, UNSCOM had destroyed facilities and a variety of biological weapons production equipment and materials. Iraq produced some 19,000 litres of botulinum toxin and 8,250 litres of anthrax in concentrated form at the Al Hakam BW factory destroyed in 1996 (and Al Manal). Indeed as configured in 1991, the Al Hakam plant was capable, in some estimates, of producing 500,000 litres of agent per year. Iraq claimed it was an animal feed factory (for single cell protein production in fermenter vessels). During the Gulf War Iraq deployed aerial bombs and missiles – according to Iraqi declarations to UNSCOM – 157 aerial bombs and 25 missile warheads containing botulinum toxin, anthrax spores or aflatoxin. Iraq almost certainly retains some BW production equipment, stocks of agents and weapons and the expertise and equipment to re-establish an offensive BW capability within weeks.

14. The extensive offensive BW programme maintained by the former Soviet Union was the largest and most sophisticated the world has yet seen. Much of the Soviet programme was concealed in an ostensibly civilian organisation (Biopreparat) whose facilities were designed to provide a mobilisation capacity that could produce bulk quantities of agent during a period of transition to war.

Soviet MOD facilities were also involved; the 1979 accident at a military BW facility in Sverdlovsk resulted in the release of anthrax spores which caused almost seventy fatalities.

15. The Iraqi and Soviet offensive BW programmes are not the only instances of past, recent or current concern. We noted in the 1999 Ministry of Defence paper that, in the less predictable post Cold War security climate, many countries of concern have biological or chemical weapons capabilities, or both. Several of these are in those regions in which the UK is most likely to face challenges to our interests, particularly the Gulf, Near East and North Africa. The proliferation threat posed by these states remains undiminished, and underscores the need to find more effective ways of combating and deterring acquisition and possession at the state level of offensive BW capabilities. Compliance with the BTWC is an issue the international community cannot avoid; if the Convention is to remain credible, there needs to be concerted determination to deal with the problem of non-compliance in an effective and sustainable manner. The UK and other BTWC States Parties cannot shirk their responsibilities on this matter.

The Terrorist threat

16. For several years, especially in the United States, there has been significant public discussion of the threat posed by the possible terrorist use of biological agents. The threat is no longer theoretical. Although there have been previous recorded attempts of BW terrorism, the anthrax attacks in the United States, coming in the wake of the 11 September events demonstrated the inherent potential of such material to have massive psychological, political and economic/financial effects, as well causing illness or death, for relatively limited effort.

The potential for the offensive use of micro-organisms and toxins: an increasing problem

17. Much science is capable of application to military objectives, and by half way through the last century several countries, including the UK, had invested in research and development programmes for biological and toxin weapons. The programmes included experimental studies of how such weapons agents could be disseminated. In most military scenarios the concept of retaliatory use that became widely accepted was the release of an agent in aerosol particles small enough to enter the lungs, though contamination of food or water supplies was also seen as a possibility. BW attacks would be difficult to detect, and large numbers of casualties could result. The UK's offensive programme continued until the late 1950s, when such work ended. Since then the UK has continued a vigorous scientific programme to study and develop specific defensive measures against BW – such work is specifically permitted by the Convention. Many of the scientific results are published in the open literature, and the UK provides a detailed overview of this work in its annual Confidence Building Measure returns submitted to other State Parties of the Convention (see paragraph 50 below).

18. Some countries support a vaccine industry where certain pathogens have to be produced in large amounts before being rendered safe for use as vaccines. Most countries have scientists who handle pathogenic microorganisms as part of the national public health response to disease, or in tackling diseases affecting animals or plants. Some of these natural disease agents would also be generally agreed to be "classical" BW agents, that is microorganisms with well known properties which make them a likely choice for a country starting to develop BW. Although it is clearly against the BTWC, an offensive programme can easily be started up by building on the skills and knowledge of scientists experienced with the microorganisms and toxins causing natural disease. History reminds us that we must not overlook the risks and comparative ease of production of "classical" BW agents such as the bacteria *Bacillus anthracis* (anthrax), *Yersinia pestis* (plague) and botulinum toxin.

19. The global spread of knowledge in the fields related to microbiology, aided by the Internet, is of course important for humankind to be able to build on such information for laudable objectives such as confronting disease. But it also means that an increasing number of countries have scientists with the knowledge and skills to be applied to developing a classical BW arsenal, with a fair chance

of success. In addition, the techniques of genetic modification are now almost universally used in the microbiology research laboratory. Such capabilities can, in principle, easily be subverted to alter the genes of classical BW agents to improve their BW characteristics. It may be possible to enhance properties such as survival, resistance to antibiotics, and ability to overcome particular prophylaxis or detection methods.

The advance of technology

20. The sheer scope of achievements in the field of genetics will probably be of surprise to few, given the level of public awareness about entirely peaceful applications involving transgenic animals and plants and genetically engineered products. There are also a number of other related and burgeoning fields of knowledge in the biological sciences which are less familiar to non-specialists. These advances are greatly increasing our understanding of how genetic information is transformed into the functions of a cell, and are leading to new ways of handling the vast amounts of information about genetic differences. We are learning much more about the genetic, structural and functional basis of microorganisms and about toxins, and there are a number of powerful new techniques for changing the properties of microorganisms or toxins.

21. The possibilities for easier production of toxins and peptide bioregulators have also increased markedly since the mid 1990s. (Bioregulators are compounds produced by cells in one part of an organism that have profound regulatory effects on biological processes within the organism. Peptides are molecules formed by linking together two or more amino acids.) Details now available of the structure and function of toxins and their sub-units, and the advances in recombinant (genetic) engineering have allowed a number of toxins to be easily produced in foreign cells or microbes, often making quantity production of a particular toxin feasible for the first time. Recovery of small amounts of bioactive peptide molecules from tonne quantities of transgenic plants has also been reported. Such advances in biotechnology thus create the potential for the misuse of peptide bioregulators in offensive BW programmes. Advances in the use of viral and bacterial vectors enhance the possibilities for direct delivery of a toxin or bioregulator to the human target, or they could be used to transfer the toxin or bioregulator genes to the target.

22. The global spread of knowledge in science and technology areas has also increased the potential for state or non-state actors in a widening range of countries to attempt to produce and disseminate pathogens or toxins as weapons. But the development of a sophisticated BW capability using genetic modification techniques requires a high level of expertise, experience and equipment – a level which has been attained by few countries. In practice, the deliberate release of “classical agents”, possibly with some features enhanced by genetic modification, currently remains a more likely threat than novel agents or novel concepts of agent/host interaction.

23. Advances in the life sciences also hold great potential benefits for human kind, including diagnostics and therapeutics to confront disease, improve crop yields and to enhance our defensive capabilities against BW (detection, protection and medical counter-measures). However, science, as always, is capable of significant deliberate misuse, in this case for offensive biological weapons purposes.

The “dual use” problem

24. The dual-use nature of virtually all the know-how, materials and equipment used in biology means that identifying and agreeing workable and acceptable verification and compliance measures for biological arms control is fraught with formidable intellectual, scientific and political problems. The rate of scientific change will only complicate matters. As the recent negotiations in Geneva have shown, these problems are not easily overcome. Identifying and agreeing effective measures to strengthen the BTWC remains therefore one of the most demanding tasks in arms control and non-proliferation.

III. REVIEW OF INTERNATIONAL ARMS CONTROL EFFORTS TO COUNTER THE BIOLOGICAL WEAPONS THREAT

The Biological and Toxin Weapons Convention

25. From 1945 until 1968 chemical and biological disarmament were considered together, the objective being a single treaty banning both types of weapons. The UK then proposed that, in order to move forward more expeditiously, it might be better to conclude a ban on biological weapons first. A draft Convention was presented in Geneva in 1969 and a text was agreed two years later in 1971 and opened for signature on 10 April 1972. The Convention's three Depositary Powers are the United Kingdom, the United States and the Russian Federation. (A Depositary Power is responsible for notifying other member States when new members join the Convention and for certain organisational aspects of the Review Conferences.) The Convention prohibits production, acquisition, stockpiling, retention and transfer of microbial and other biological agents and toxins for anything other than prophylactic, protective or other peaceful purposes. It contains very limited mechanisms for State Parties to raise any concerns about another country's compliance. What mechanisms there are focus on consultations between States Parties, with provision for cases of serious unresolved concern about compliance to be taken to the UN Security Council for consideration. There are now 145 States Parties and 18 Signatories. Although the Convention only allowed for one Review Conference to review its operation with a view to assuring that its provisions were being realised, there have been further Review Conferences at roughly five yearly intervals. These Conferences have also examined new scientific and technological developments relevant to the Convention.

Efforts to strengthen the Convention

26. The Convention entered into force in March 1975. Many States Parties recognised at the time that the Convention's compliance procedures could and should be made stronger. However, the nature of international politics in the 1970s meant that verification measures including inspections were not a practical proposition. Instead, initial efforts concentrated on building up the Convention's consultative procedures. Even so, progress was slow. The Second and Third Review Conferences held in 1986 and 1991 outlined procedures for a Consultative Meeting of States Parties to review and consider cases of non-compliance. This mechanism, elaborated in Review Conference Final Declarations, has been used only once. In 1997 Cuba raised concerns over the alleged use of the insect *thrips palmi* by the United States to attack Cuban crops. The report of the Consultative Meeting to consider this complaint concluded that "*due inter alia to the technical complexity of the subject and the passage of time, it has not proved possible to reach a definitive conclusion with regard to the concerns raised by the Government of Cuba.*" Perhaps of equal significance, the report also recorded that "*the experience of conducting this process and consultation had shown the importance of establishing as soon as possible an effective Protocol to strengthen the Convention...*" The United Kingdom has taken a leading role throughout all of the subsequent efforts to strengthen the Convention.

Confidence Building Measures (CBMs)

27. At the Second BTWC Review Conference in 1986 States Parties agreed four modest "confidence building measures" as a means to provide transparency about certain legitimate activities. These CBMs called for annual declarations to the UN of information on maximum containment laboratories, unusual outbreaks of disease, encouragement of publication of results (including promotion of use of knowledge in biological research directly related to the Convention), and active promotion of contacts between scientists. The first two measures were supported by a number of countries in large part as a response to the 1979 anthrax outbreak in Sverdlovsk caused by an accident at a Soviet BW facility. Additional CBMs, as well as revisions to the existing measures, were agreed at the Third Review Conference in 1991. Submissions were now also required on the existence of national biodefence research and development programmes, on whether past defensive or offensive BW programmes had existed, and on human vaccine facilities.

28. These CBMs are politically but not legally binding and this has had an adverse effect on their success. Since the first annual returns in 1987 the overall rate of response has been disappointing, both in quantitative and qualitative terms. Many have been incomplete or inaccurate.

Ad Hoc Group of Governmental Experts to identify and examine potential verification measures from a Scientific and Technical standpoint (VEREX)

29. The Third BTWC Review Conference in 1991 established an open ended expert Group to evaluate possible verification measures from a scientific and technical standpoint. Specific criteria for such measures were provided in the Group's mandate. These included *inter alia* the ability to distinguish between permitted and non-permitted activities and the implications of any measures for commercial proprietary information. This Group, known as VEREX, held meetings during 1992-93 and identified some 21 separate possible on-site or off-site measures. In its final report the Group stated that potential verification measures could be useful to varying degrees in enhancing confidence, through increased transparency, that States Parties were fulfilling their obligations. Following consideration of this report, a Special Conference of States Parties met in September 1994 and agreed a new mandate for an Ad Hoc Group of States Parties to consider appropriate measures, including possible verification measures, and to draft proposals to strengthen the Convention. These were to be included, as appropriate, in a legally binding instrument.

Work of the Ad Hoc Group (AHG)

30. Between January 1995 and August 2001 in Geneva the AHG held 24 sessions, ranging between one and four weeks in duration. Throughout this process the United Kingdom played a leading role. The UK delegation was led by the Ambassador to the Conference on Disarmament in Geneva, and included representation from the FCO, MOD and DTI, with expert technical advice provided by DSTL Porton Down. Initial exploratory and then textual negotiations were taken forward on specific issues. The UK chaired meetings at the AHG on compliance measures and on declaration formats. Latterly the UK also provided an expert (an editorial facilitator) to help the Chairman complete the draft Protocol that was the result of the AHG's work.

31. The UK delegation in addition submitted forty-three formal working papers on background issues such as vaccine production and on proposals for the draft text, as well as many other informal papers designed to help broker compromises on particularly difficult issues. The UK made significant contributions in the elaboration of key elements of what became the draft Protocol. These related primarily to declarations of facilities and national biological defence programmes and to formats which would set out the information that declared facilities would have to provide; visits to declared facilities; procedures for States Parties and the implementing organisation to clarify declarations made by others; investigations into alleged violations of the Convention; and scientific and technological cooperation. On co-operative aspects, the significant focus in the Protocol's Article 14 on specific measures to tackle infectious disease owed a great deal to UK proposals.

The "Composite text" (the Protocol)

32. On 30 March 2001 the AHG's Hungarian Chairman (Ambassador Tibor Toth) presented his "composite text" of the Protocol. This represented his judgement of a possible compromise text that took account of a wide range of political and technical difficulties. Most of the text had already been seen as acceptable by delegations in earlier sessions. Ambassador Toth only had to provide a relatively small number of compromise formulae on the most difficult issues, some of which had already been aired in consultation with interested delegations prior to the tabling of the "composite text".

The "Composite text": contents

33. The draft Protocol contained some thirty articles, three annexes and nine appendices. The Annexes and Appendices largely provided technical and background detail. The Protocol's principal Articles covered:

- declaration of facilities and programmes.
- measures to ensure submission of declarations.
- follow-up after submission of declaration (visits and measures for clarifying declarations).
- measures to strengthen Article III of the Convention (preventing transfers of materials and equipment for purposes prohibited by Article I of the BTWC).
- consultation, clarification and co-operation.
- investigation (challenge inspections) into possible non-compliance with the BTWC.
- assistance and protection against BW.
- scientific and technological exchange for peaceful purposes.
- creation of a new implementing organisation.
- national implementation measures.

The Composite Text: UK views

34. Overall the UK judged that the Chairman's draft Protocol's provisions, although not as extensive in some areas as we would have wished, nonetheless represented a substantive improvement on the *status quo* represented by the Convention. In areas of particular importance to the UK (declarations, visits, investigations and a professional inspectorate), the Protocol would have delivered significant benefits for transparency, monitoring and deterrence in key dual-use areas capable of misuse. It would have provided a much more effective investigation mechanism than that available under the Convention's Article VI and the existing United Nations Secretary General system for dealing with cases of alleged use of CBW. It would as such help to deter and investigate suspected non-compliance, whether concerning the activity of a particular facility, an alleged use of biological weapons or a suspicious outbreak of disease.

35. Notwithstanding the acute difficulties of distinguishing between permitted and non-permitted activities because of the "dual use" issue, we judged that the safeguards in the Protocol's on-site provisions provided effective protection for legitimate activities and for national security and commercial proprietary information. Prior to the negotiations, in 1993 and 1994, managers at four industrial facilities in the UK agreed to work with government officials in carrying out role play practice challenge inspections to verify whether such safeguards would indeed be adequate; two practice visits were also held (1996 and 1997), one of which was a joint exercise with Brazil. These demonstrated that it was feasible to devise procedures that would allow inspecting teams to gather sufficient information to do their job whilst protecting legitimate sensitive information. Many of the lessons from these exercises were reflected in the Protocol's procedures for visits and investigations. A separate and continuing series of practice challenge inspections at military facilities in connection with the Chemical Weapons Convention also helped, and helps to give us confidence that national security information can be protected even at the most sensitive of establishments.

36. The declarations and associated declaration formats of the draft Protocol would have required States Parties to submit detailed information on a range of particularly relevant facilities capable of misuse for BW purposes. Provision of such information, in the UK view, would help to build confidence over time that declared activities are as they are claimed. A burden would be imposed on would-be proliferators through declarations of at least some of their facilities with potential

relevance for an offensive BW programme. Declarations and listing of some pharmaceutical and other microbiological production facilities would have provided a window on a range of key activities and capabilities in States Parties. Such an insight on production is important both because of the past examples of the use of ostensibly legitimate industrial facilities for BW production, and because of their future potential for misuse of technological developments and applications. The objective in devising the range of declarations was to capture as high a percentage as politically possible of those sites and activities of greatest potential utility to an offensive BW programme.

37. Visits to declared facilities by personnel from the proposed international organisation charged with implementation of the Protocol would have imposed a minimum obligation on States Parties to provide a specified level of openness. This satisfied our primary objective of using such visits to enhance global transparency by providing a better understanding of the nature and scale of activities that were underway at declared facilities. Visiting team access rights were sufficient to meet this modest but key objective. Procedures for clarifying declarations would have permitted States Parties to raise questions over problems in the contents of facility declarations (omissions and ambiguities, for example), and about facilities which, they believed, should have been declared but were not. If necessary a mandatory visit could take place at such locations to establish the facts of the matter.

38. The UK judged that the investigation package, including the rights of investigating teams once on site, was robust enough to provide a level of deterrence and improve our ability to investigate cases of suspected non-compliance. Investigation team rights, whether in relation to facilities, cases of alleged use or suspicious outbreaks of disease thought to be connected to violations of the Convention, were adequate to enable such teams to acquire a wide range of information that would help the international community better understand whether non-compliance had occurred.

39. Overall therefore it was the UK view that implementation of the draft Protocol would represent a net gain. It would yield valuable data about facilities and activities in countries of concern, and would complicate and constrain efforts to prosecute offensive BW programmes, without exposing our own legitimate activities to unacceptable risks. Our judgement was that its package of compliance measures would represent an effective strengthening of the Convention.

Reactions to the Composite Text

40. Any text that emerges from a multilateral negotiation, especially one where there are a wide range of views and the technical problems in the design of effective measures are acute, is necessarily a compromise. In judging whether such a text is acceptable, all delegations have to make their own cost-benefit analysis. Inevitably there will be parts of the text that some, had they a free hand in drafting, would have written differently or not even included at all. The UK would have preferred stronger measures for ensuring compliance and transparency. When the composite text was debated in detail at the 24th AHG session in July 2001, some fifty States Parties indicated that, on balance, they were prepared to accept the text or see it as a basis for the final compromise. Some delegations, such as China, Cuba, Iran, India, Libya and Pakistan, were not prepared to indicate their unequivocal support for the composite text.

41. The United States was not able to accept the text, stating that it posed too a great a risk to US national security and commercial interests. In addition, the US asserted that the whole approach underpinning the Protocol was flawed and that the problems of biological warfare were not amenable to traditional arms control solutions. The 24th AHG session thus reached no agreement. In reaching its decision on the balance of burden versus benefit, the US also took into account the uniquely large scale and importance of its biodefence programme and pharmaceutical industry and the associated concerns over protection of information of the greatest sensitivity for national security and commercial confidentiality. Statements by US officials have also indicated that the US Government doubted whether the arrangements proposed in the Protocol would effectively indicate cheating or ever enable suspicions to be proved or disproved categorically, even in the case of an investigation.

42. In reaching such judgements, a great deal depends on what one sets as the objectives for the Protocol and how one evaluates risks. If the objective is on greater levels of transparency, better tools for tackling non-compliance and focussed scientific and technological co-operation measures, then a useful role can be demonstrated for the draft Protocol as an adjunct to other measures. Its defence does not lie in protestations that it is better than nothing, or that any agreement on these issues is worth having as an end in itself.

43. Consideration of the AHG's future and the way forward was a matter for the Fifth Review Conference scheduled for 19 November to 7 December 2001. But there was a widespread view amongst delegations at the 24th AHG session that, without US participation, it was not worth pursuing a Protocol. Factors considered included the relative size and scope of the US biodefence programme and pharmaceutical industry, and the belief that certain other key countries would not agree to be bound by the terms of the Protocol if the US was not. There would therefore be a crucial gap in global transparency if the US did not join.

Fifth Review Conference

44. Without a consensus on the composite text, thought had to be given to possible alternative measures that might contribute to the original objective of strengthening the Convention as specified in the AHG's mandate. The United States had already made clear its continuing commitment to strengthening the BTWC and had undertaken to develop new ideas for presentation at the Fifth Review Conference. The European Union also developed proposals for presentation at the Conference, to which the UK made an important contribution. Some ideas were common to both sets of proposals, such as improvements to biosafety, investigations into alleged use of BW, and codes of conduct for scientists working in relevant areas. The main differences of view centred on the nature of follow-up work to the Conference, and whether this should be primarily or exclusively national, or entail some element of multilateral negotiation or review to elaborate the new measures and attempt co-ordinated national and international implementation. Following a US proposal to wind up the Ad Hoc Group and terminate its mandate, which was not accepted, the Conference decided to suspend its work for a year. It agreed to resume for a two-week period beginning on 11 November 2002.

IV. THE NEED FOR RENEWED INTERNATIONAL EFFORTS TO COUNTER THE THREAT AND STRENGTHEN THE CONVENTION

Why international co-operative efforts remain important

45. As argued above, the rapid rate of technological change and expansion of knowledge in the life sciences is a global phenomenon with implications for human, animal and plant health. These developments also pose huge problems and risks for the BTWC. These facts alone must give increased urgency to efforts to find ways in which we can counter the threat of BW and strengthen the Convention. Infectious disease knows no boundary, and therefore responses have to be global. Threats to international security posed by BW proliferation are not confined to regions or individual states. Consequences of violations of the BTWC could be world-wide. BW terrorism has potential implications way beyond the nation state where any particular outrage may be perpetrated. The events of 11 September demonstrate this unambiguously. Global problems ideally require global co-operative solutions; individual efforts taken at a national level, although useful and, in some cases, essential, can have a truly global impact only if they are implemented by states in concert and to a uniform standard.

46. The United Kingdom believes that the international community still needs to tackle the issue collectively and that we must continue where possible and appropriate to seek measures that can be agreed and implemented on the widest international basis, with the objective of including both all States Parties to the BTWC and those states that have not yet joined the Convention. We need to develop collectively the tools to identify and expose non-compliance with the Convention. We also

need to impose the will of the international community on cheats and proliferators. The fact that we have concerns that the Convention is being flouted is a reason for redoubling our efforts, not abandoning them. In an imperfect world, we can never expect complete assurance, and international agreements should never be allowed to create a false sense of security. But we must always strive to sustain an international society based on the rule of law.

Identification of possible international and national measures

47. The UK, our EU partners, the US and academics in a number of countries have identified a range of measures that could be deployed to strengthen the Convention. Some of these could be pursued at the national level, some at an international level. These potential measures include:

- (a) **investigations into suspected non-compliance with the Convention (alleged use of BW, misuse of facilities and suspicious outbreaks of disease):** these could take the form of an expanded and revised version of the existing UN Secretary-General process for investigating alleged CBW use. (This process was developed to respond to alleged cases of CBW use in South East Asia and Iran/Iraq in the early and mid 1980s.) Alternatively it could be included in either a free-standing or combined international agreement that covered other topics such as assistance in the event or threat of BW attack. We think that it is unlikely that a free standing agreement would be easily negotiable unless it also contained some scientific and technological assistance elements. President Bush's statement of 1 November 2001 on strengthening the international regime against biological weapons proposed that all States Parties agree to accept an effective United Nations procedure for investigating suspicious outbreaks of disease or allegations of biological weapons use. To be effective, such a regime would clearly require wide international adherence.
- (b) **assistance in the event of, or threat of, use of BW:** States Parties could reiterate and re-emphasise their existing obligation under the BTWC to provide various kinds of assistance in the event of a BW attack, or serious threat of attack, by any State or non-State actor against a State Party. Such a commitment would be without prejudice to the participating states' own security and political sensitivities, and would be consistent with the provisions of the UN Charter on collective and regional security responsibilities. Constituent elements of such an assistance package might include diplomatic support, economic aid and sanctions against BW use, conventional military assistance and supplies, the provision of pre-stockpiled vaccines, antibiotics, antivirals, and decontamination.
- (c) **national criminal legislation and extradition:** in those cases where they have not already done so, States Parties should pass national criminal legislation translating the prohibitions in the Convention into domestic law.
- (d) **a Scientific Advisory Panel:** in view of the dramatic pace of technical change in the life sciences as described above, an open ended body of government and non-government scientists should meet every one or two years to review the changes and assess their implications for the Convention and measures being taken to strengthen it. The accelerating pace of scientific developments now makes it quite unsafe only to have five yearly technology reviews by the States Parties to support the five yearly Review Conferences.
- (e) **revised CBMs:** the existing set of CBMs could be revisited to see whether there is room for improving their scope or level of detail to ensure more useful annual returns by States Parties. This could include an annex on the level of information exchanged voluntarily between states, as well as possible voluntary visits to be agreed between participating States Parties to facilities notified under the existing or revised CBMs, or indeed to any facilities that both sides agreed could be subject to visits, reciprocal or otherwise.

- (f) ***a new Convention on Physical Protection of dangerous pathogens:*** there may be scope for exploring the feasibility and desirability of a new international agreement that would set standards for physical protection, containment measures and operating procedures for dangerous pathogens held or worked upon in academic, government, industrial or research laboratories. The containment of genetic modification involving pathogens or genes coding for toxins should also be addressed. States Parties should in any case be encouraged to enact tighter domestic controls on the use, storage and transfer of pathogens. The UK's new anti-terrorist legislation (*The Anti-Terrorism, Crime and Security Act 2001*) provides a good example of legislation containing measures to prevent the unauthorised acquisition of pathogens and toxins. This Act also includes a broadening of the range of biological agents covered by the Terrorism Act 2000 and extends the range of devices containing biological agents and toxins used for hostile purposes to include those not captured by the Biological Weapons Act 1974.
- (g) ***a new Convention on Criminalisation of CBW:*** there are already proposals, developed initially in the academic community, for a new Convention that introduces criminal responsibility for any individual indicted for violating the prohibitions in the Biological and Toxin Weapons Convention or the Chemical Weapons Convention. States would be obliged to prosecute or extradite indicted individuals. For the UK, consideration of extradition to states outside the EU could be considered. Existing UK legislation, the Biological Weapons Act 1974 and the Chemical Weapons Act 1996, already provides for penal legislation for violation of the BTWC and CWC by individuals in the UK and abroad.
- (h) ***increase efforts on disease surveillance, detection and diagnosis and countering infectious disease generally:*** this would be done through existing national and/or international efforts (i.e. via World Health Organisation/UN Food and Agriculture Organisation/Organisation International des Epizooties programmes). The overall framework within which any action plans were pursued would need to be clear. Private foundations or companies might also contribute funding. The spread of disease, and the emergence of new diseases, as well as of re-emerging diseases, are increasingly global problems, not just limited to developing countries. Such efforts/measures would apply to human, animal and plant diseases. The newly created *National Infection Control and Health Protection Agency* in the UK will assess the threat of new and emerging infectious diseases, intensify control measures and implement a programme of vaccine development. Such an approach is a good illustration of a national response that could be considered more widely.
- (i) ***codes of conduct for professional bodies:*** such codes would be developed by academic and professional bodies to lay out standards internationally for work relevant to the prohibitions of the Convention. Such codes could include, *inter alia*, a statement that scientists will use their knowledge and skill for the advancement of human, animal and plant welfare and will not conduct any activities directed toward the use of microorganisms or toxins or other biological agents for hostile purposes or in armed conflict.
- (j) ***actively promoting universal membership of the BTWC:*** as of early 2002 there are 145 State Parties to the BTWC; further diplomatic efforts could be made to encourage full membership of the Convention and participation in Review Conferences.
- (k) ***withdrawal of reservations to the 1925 Geneva Protocol:*** many States Parties to the BTWC retain their right through reservations to the Protocol to retaliate in kind if they are attacked with BW. Given the legal inconsistency with the obligations they have undertaken in the BTWC, those retaining rights of retaliation should be urged to lift them.

V. IMPROVEMENTS TO EXPORT CONTROLS, DETERRENCE AND DEFENCE CAPABILITIES

48. There are of course other measures, primarily at the national level, that are already being taken and could be expanded upon or revised to combat the BW threat by strengthening the other "pillars" of export controls, deterrence and defence. These include effective national legislation on the export of agents, equipment and materials potentially useful for offensive BW programmes (including revisions to the Australia Group's control lists to ensure that they remain up to date and effective), development of more effective vaccines and other therapeutics, better co-ordination at the national level for responding to infectious disease, better intelligence on the nature of the proliferation threat, greater investment in counter-terrorism and national preparedness. Such activities can and should be pursued co-operatively with other like-minded countries wherever possible and appropriate. Pooled resources, sharing experiences and information, joint training and co-ordination will help improve the efficacy of steps taken nationally.

49. At the international level a UN Security Council Resolution underlining the Council's determination to counter any BW use or threat of use could help deter non-compliance. Indeed this was the original intention in 1972 when the BTWC was concluded, namely to pass a resolution signalling the Council's determination to respond seriously to any violation of the Convention.

The role of biodefence

50. The UK maintains an extensive biological defence programme. This is reported annually to the UN and BTWC States Parties under the BTWC CBM returns. By way of summary, the UK's national biological defence research and development programme has four objectives: to assess the hazard to UK Armed Forces from biological and toxin warfare agents which might be used by an aggressor; to establish effective means and procedures for the detection, warning, identification, diagnosis and monitoring of BW agents; to provide physical protective measures to defend the UK Armed Forces against BW agents; and to provide medical counter measures for prophylaxis, therapy and treatment against BW agents. The paper *Defending Against the Threat from Biological and Chemical Weapons* describes in greater detail the extent of the UK's biodefence efforts.

51. HMG invests a substantial amount of effort into continually improving its biodefence capabilities. Our research programmes are proactive by making optimum use of the best expertise available within the defence research community, the civil sector and allied nations. We continue to provide world-leading equipment, training and expertise to the UK Armed Forces to ensure that they are offered the highest levels of protection against the biological threat.

52. The UK believes that measures are complementary to the disarmament obligations contained within the Convention and to measures that can and should be taken to strengthen it. Such effective protective measures diminish the military utility of BW to a potential aggressor, and hence reduce the likelihood of their use. A capability to respond to terrorist use of CBW is also maintained and this involves co-operation and co-ordination across a wide range of government departments, including primarily the Home Office, Department of Health and Ministry of Defence.

VI. UNITED KINGDOM PRIORITIES

53. The UK believes that a range of measures must be deployed to combat the BW threat. International co-operative efforts in the framework of the BTWC provide a key way of responding to the perversion of science that is biological warfare. Where therefore are the priorities for strengthening the BTWC?

54. The UK sees five specific areas for immediate action: establishment of an effective and legally binding process for investigation into suspected non-compliance with the Convention, to include misuse of facilities, unusual outbreaks of disease believed to be connected to a violation of the Convention, and alleged use of BW; greater efforts to tackle the threat posed by natural infectious disease to human, animal and plant health; criminalisation of violations of the Convention; the implementation by more countries of effective physical protection, containment measures and operating procedures for dangerous pathogens and toxins, and genetic modification; and greater transparency between States Parties about their legitimate activities whose dual-use capabilities might be in danger of being misconstrued or misused. Other options, as noted in paragraph 47 above, are possibilities and the UK is ready to examine these and any others that may serve to counter the threat.

VII. THE WAY FORWARD

55. Given the failure of the AHG to reach consensus on the composite text and the failure of the 2001 Review Conference to identify a way forward, it is important to remain flexible on how the international community might best tackle the pressing need to strengthen the effectiveness of the Convention in deterring the proliferation of BW. National, regional and international efforts will all have synergistic effects. The UK favours a combination. One option at the international level might be to have annual reviews of the Convention to hear reports on progress made by expert groups tasked with time limited and focussed mandates. Such groups would be tasked to elaborate specific measures and/or to report on specific developments relevant to the Convention.

56. Maintaining the health of the Convention is not just a matter for governments. This is especially true now, given the rate of technical change in the life sciences described above and its increasing complexity. The UK believes that there is a vital role to be played by academia, industry, the medical and veterinary communities. Professional and trade bodies in the UK such as the Royal Society, the British Medical Association, the Institute of Biology, the Association of the British Pharmaceutical Industry and the Bioindustry Association have already taken a close and constructive interest in the BW problem and in efforts to strengthen the Convention. Efforts to take forward codes of ethical conduct (paragraph 47 (i)) will rely upon such bodies to play a leading role. The views of industry will continue to be important, particularly in view of the way the revolution in knowledge is being taken up in biotechnology applications, for example in the pharmaceutical industry. Industry has an important contribution to make to the battle against the BW threat, given the inherent potential for misuse of much of their knowledge and technology base.

57. There may be considerable merit in convening annual meetings involving those in both the UK government and non-government communities with an interest in maintaining the health of the BTWC. Such meetings would help sustain visibility of the issues, provide an interdisciplinary forum for exchanging views on ways of strengthening the Convention and on relevant scientific and technological developments. There could also be a case for some permanent machinery for preparing the annual meetings and for monitoring developments between them.

58. The FCO is publishing this paper to solicit the views of Members of Parliament, NGOs, other organisations and individuals with an interest in this subject. Comments are invited so that the options for strengthening the BTWC set out in this paper – or any other options that may be suggested – receive the widest possible consideration and debate before the reconvened Review Conference. Comments should be sent to:

Non Proliferation Department
Room W118A
Foreign and Commonwealth Office
King Charles Street
London SW1A 2AH
or by email to: npd.fco@gtnet.gov.uk
by Friday 13 September 2002.

GLOSSARY

AHG: Ad Hoc Group – the Group of States Parties to the BTWC involved in negotiations to strengthen the Convention.

BTWC: Biological and Toxin Weapons Convention

BW: Biological weapons

CBM: Confidence Building Measure(s): politically binding declarations of information provided under the BTWC.

CBW: Chemical Biological Weapons/Warfare

CW: Chemical Weapons

CWC: Chemical Weapons Convention

COMPOSITE TEXT: The name given to the draft Protocol to the BTWC presented by Ambassador Tibor Toth to the Ad Hoc Group.

UNMOVIC: United Nations Monitoring, Verification and Inspection Commission – the successor body to UNSCOM. Established by Security Council Resolution 1284

UNSCOM: United Nations Special Commission. Established by Security Council Resolution 687 to oversee the destruction of Iraq's weapons of mass destruction programmes and its ballistic missiles with a range greater than 150 km.

VEREX: Ad Hoc Group of Governmental Experts to Identify and Examine Potential Verification Measures from a Scientific and Technical Standpoint



GLASSBORO

1982-83 - The Group - the Group of "Iraqi Factors to the D.I.W.C." received by representatives of
the Group of "Iraqi Factors to the D.I.W.C."

1983 - Iraq's "Iraqi Factors to the D.I.W.C."

1984 - Iraq's "Iraqi Factors to the D.I.W.C."

1985 - Iraq's "Iraqi Factors to the D.I.W.C." particularly focusing on the "Iraqi Factors to the D.I.W.C."

1986 - Iraq's "Iraqi Factors to the D.I.W.C."

1987 - Iraq's "Iraqi Factors to the D.I.W.C."

1988 - Iraq's "Iraqi Factors to the D.I.W.C."

1989 - Iraq's "Iraqi Factors to the D.I.W.C." The issue given to the Iraq Factor to the D.I.W.C. received by Ambassador
1990 - Iraq's "Iraqi Factors to the D.I.W.C."

1991 - Iraq's "Iraqi Factors to the D.I.W.C." Monitoring, Verification and Inspection Commission - the attention
1992 - Iraq's "Iraqi Factors to the D.I.W.C." established by Security Council Resolution 688

1993 - Iraq's "Iraqi Factors to the D.I.W.C." Special Commission, established by Security Council Resolution 687
1994 - Iraq's "Iraqi Factors to the D.I.W.C." of Iraq's members of Iraq's disarmament programme and its ballistic
1995 - Iraq's "Iraqi Factors to the D.I.W.C." missiles (more than 150 km)

1996 - Iraq's "Iraqi Factors to the D.I.W.C." of Iraq's members of Iraq's disarmament programme and its ballistic
1997 - Iraq's "Iraqi Factors to the D.I.W.C." missiles (more than 150 km)





Published by The Stationery Office Limited
and available from:

The Stationery Office

(Mail, telephone and fax orders only)

PO Box 29, Norwich NR3 1GN

General enquiries 0870 600 5522

Order through the Parliamentary Hotline Lo-call 0845 7 023474

Fax orders 0870 600 5533

Email book.orders@tso.co.uk

Internet <http://www.tso.co.uk>

The Stationery Office Bookshops

123 Kingsway, London WC2B 6PQ

020 7242 6393 Fax 020 7242 6394

68-69 Bull Street, Birmingham B4 6AD

0121 236 9696 Fax 0121 236 9699

33 Wine Street, Bristol BS1 2BQ

0117 9264306 Fax 0117 9294515

9-21 Princess Street, Manchester M60 8AS

0161 834 7201 Fax 0161 833 0634

16 Arthur Street, Belfast BT1 4GD

028 9023 8451 Fax 028 9023 5401

The Stationery Office Oriel Bookshop

18-19 High Street, Cardiff CF1 2BZ

029 2039 5548 Fax 029 2038 4347

71 Lothian Road, Edinburgh EH3 9AZ

0870 606 5566 Fax 0870 606 5588

Accredited Agents

(See Yellow Pages)

and through good booksellers

ISBN 0-10-154842-7



9 780101 548427