

# CHEMICAL WEAPONS CONVENTION BULLETIN

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## THE ROLE OF THE SCIENTIFIC COMMUNITY WITHIN THE CONTEXT OF THE CONVENTION

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The international scientific community should be able to provide a dispassionate analysis of the development of science and technology from the point of view of the Convention. Indeed, almost all of the Articles of the Convention provide ample justification of the necessity for taking competent scientific advice.

To obtain the best possible means of verification through continuous updating, it will be absolutely necessary to ensure that the implementation of this treaty keeps pace with scientific and technological developments. One will have to minimize and, as much as possible, anticipate the risks inherent in the appearance of new substances, whatever their origin may be, as well as of new technologies with the potential to undermine or to circumvent the Convention, should they not be identified and dealt with in time.

The Convention can only become an evolving and living institution, without any change in its purposes, principles and provisions, through the establishment of a credible scientific body constituted in an advisory capacity, but without decision-making powers. Such a body will originate from within the international scientific community, which will then provide it with constant support.

### **Function of the Scientific Advisory Board**

Paragraph 21 (h) of Article VIII states that the Conference of the States Parties "shall review scientific and technological developments that could affect the operation of this Convention". "In this context, [the Conference of the States Parties] shall direct the Director-General to establish a Scientific Advisory Board to enable him, in the performance of his functions, to render specialized advice in the areas of science and technology relevant to this Convention, to the Conference, the Executive Council or States Parties."

In fact, the Scientific Advisory Board (SAB) will be expected to provide the Conference of the States Parties, as

*\* The views expressed in this article are those of the author in his personal capacity.*

well as the Executive Council, with a considered opinion on any scientific or technological innovation or development which could have implications for the objectives of the Convention. The SAB could make recommendations to the Director-General concerning any scientific or technological advancements which might facilitate improved monitoring of and thus greater respect for the provisions of the Convention.

Lastly, any State Party should be able to request from the SAB any information or clarification deemed necessary to respond to any question it may have, for instance in the fields of verification methods, the development of new toxic substances or of new techniques for the production of toxic agents.

### **Composition and organization of the SAB**

In this respect, the Convention states that "the Scientific Advisory Board shall be composed of independent experts appointed in accordance with terms of reference adopted by the Conference" (see paragraph 21 (h) of Article VIII).

It is further stated in paragraph 45 of the same Article that "the Director-General shall be responsible for the organization and functioning of the Scientific Advisory Board ... He shall ... appoint members of the Scientific Advisory Board, who shall serve in their individual capacity. The members of the Board shall be appointed on the basis of

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their expertise in the particular scientific fields relevant to the implementation of this Convention.”

Several important concepts may be derived from the above provisions. First, the members of the SAB shall serve “in their individual capacity,” and will under no circumstances represent their respective governments. These “independent experts” should thus be able to offer independent advice to the various executive organs of the Convention. However, the appointment of the experts will be subject to consultation with the States Parties by the Director-General. Will we then witness a kind of political negotiation to ensure, for instance, either that this or that country is represented on the Board or that there is balanced geographical representation within the SAB? The latter would affront the international scientific community at large, as the Convention clearly specifies that “the members of the SAB shall be appointed on the basis of their expertise.” On the contrary, an agreement will need to be reached between the States Parties regarding a definition of this concept of expertise in relation to those fields of technological and scientific expertise to be viewed as selection criteria for the SAB. It will be important to ensure that they are based on real knowledge which is animated by an awareness of the most recent scientific and technological developments.

It is only under such circumstances that independent advice can be offered freely and in a responsible way by a body which has no vested interest. In the absence of this, the risk is that any technological or scientific development will stimulate discussions and disagreements amongst the States Parties or with the Technical Secretariat. In such a case the established bodies of the Convention would of course have to take the necessary decision. But any such decision will be made most rapidly and clearly if it is based on impartial opinions such as would be provided by an SAB vested with incontestable scientific authority and independence.

### **The tasks of the SAB**

In general, the Convention takes account of scientific and technological developments using as a basis the criteria as defined in paragraph 1 (a) of Article II. However, it will be important to ensure that the Technical Secretariat and the Executive Council have the maximum amount of information at their disposal to exercise control and to form a judgement when they are confronted with new problems.

In this respect, the SAB should be in a position — directly or indirectly — to play an advisory role in the following fields:

- the monitoring of all scientific and technological development and progress, especially in those fields that have a direct impact on the functioning of the Convention:
  - chemistry
  - chemical engineering
  - pharmacology
  - biotechnologies
  - industrial chemistry

- toxicology
- micro-biological and enzymatic engineering
- military sciences

- the identification of new scientific and technological fields which are potentially related to the Convention;
- the identification of new toxic chemicals and new precursors which could be added to the schedules of products, or of new synthetic methods facilitating the production of these products;
- the provision of additional information regarding requests for revision of the schedules proposed by the States Parties;
- proposals to revise the guidelines determining the assignment of a particular substance to a particular schedule;
- the identification of technological developments which could increase efficiency, or on the contrary could lead to new problems in verification operations, in particular analytical techniques, continuous monitoring systems, and new industrial processes;
- proposals concerning cooperation between the States Parties, the scientific community, and the OPCW for collecting and making available relevant technological and scientific information;
- proposals concerning possible means for the development of scientific and technological cooperation between the States Parties in the context of the CWC.

### **Functioning of the SAB**

The realization of the tasks listed above presupposes a clear definition of the respective responsibilities of the SAB and the Director-General.

Indeed, the Convention states that “the Director-General may also, in consultation with members of the Board, establish temporary working groups of scientific experts to provide recommendations on specific issues. In regard to the above, States Parties may submit lists of experts to the Director-General” (paragraph 45 of Article VIII).

In reality, this convoluted provision reflects the differences of opinion which surfaced during the negotiations regarding the responsibilities of the SAB and its relationship with the different bodies of the OPCW. This provision does not facilitate a harmonious division of responsibilities. The States Parties will, indeed, be involved in both the making of proposals for the members of the SAB and the submission of lists of experts to enable the Director-General, in consultation with members of the Board, to establish the temporary working groups on specific issues referred to above.

It is almost certain that the Director-General will be principally preoccupied with the difficult tasks associated with verification. If one admits that a handful of the OPCW staff will be responsible for remaining up-to-date with technological and scientific literature, which in general lags be-

hind research and development, as well as for the specific resolution of technological problems in the context of verification, it is clear that the Technical Secretariat will not itself be in a position clearly to assess the real impact of technological and scientific progress on the spirit and the implementation of the Convention.

The SAB should be the engine of such an assessment, and its functioning would be based on flexible organization and a clearly-defined relationship with the Technical Secretariat.

The SAB could, for instance, be composed of several study groups, whose task would be to monitor developments in the different technological and scientific fields and to submit a report to the Executive Council on an annual or, if need be, an emergency basis.

### ***The role of the Preparatory Commission***

Paragraph 21 (h) of Article VIII states that the Conference shall adopt criteria to facilitate the appointment of independent experts who will compose the SAB. It is thus up to the Preparatory Commission to prepare and to adopt the necessary provisions. However, in addition to these criteria, and to ensure that the SAB is operational as soon as the Convention enters into force, the Commission should in particular pay attention to the following aspects:

- the length of appointment of the members of the SAB;
- renewal of its membership, in particular in relation to the development of new disciplines which could affect the Convention;
- the definition of the functions of the SAB;
- determining the operating procedures of the SAB;
- the definition of the role of the Director-General.

The Preparatory Commission should thus try to provide a clear and unambiguous definition of the scientific character of the SAB, setting aside any temptation to make of it a political body, and should confer upon it the necessary scientific authority and independence, since the advice it offers will, in some cases, have a direct impact on the Convention and its implementation.

### ***The international scientific community***

Many scientists are interested in disarmament, more particularly nuclear disarmament, to a greater or lesser extent and for different reasons, and have often made significant contributions by alerting public opinion and governments to the danger and the threats linked in particular to weapons of mass destruction. Numerous national academies, associations, and learned societies have shown an interest in the disarmament issue in general.

Although chemical disarmament has not generated the same interest as nuclear disarmament within the scientific community, something which is understandable due to the difference in the nature and degree of threat, over the past few years information relating to chemical disarmament has

gradually been made known to a broader public. Those who negotiated the Convention in Geneva, as well as the governmental authorities of the most involved countries, have benefited from the knowledge and assistance of well-known scientists in different fields of expertise.

The preparatory phase of the implementation of the Convention currently in progress should allow for communication between scientists throughout the world who are sensitive to the issues related to chemical disarmament, with a view to:

- disseminate information amongst all potentially interested scientists;
- stimulate reflection on the relationship that should be developed between the international scientific community and the Organization for the Prohibition of Chemical Weapons;
- propose an organizational structure for the Scientific Advisory Board, as a basis for discussion by the Commission;
- develop criteria which will facilitate the definition of the composition and appointment of the members of the SAB;
- determine the fields, subjects and issues which are currently, or are likely to be sensitive from a scientific and technological point of view and are relevant to the effective implementation of and respect for the Convention.

Various organizations representing scientists have already given some thought to problems related to the Convention. A means has yet to be found for the good will which already exists amongst scientists to be channelled with increased effectiveness towards the goal of chemical disarmament.

### ***Concluding remarks***

To ensure the best possible implementation of the Convention, it is important to be able to make appropriate use of the expertise of qualified representatives of the international scientific community, without, however, involving them in the administration of the established regime of the treaty. One should at all costs avoid anything that might resemble “a Government of Wise Men”.

The purpose of calling upon scientists is to avoid a blind, blinkered application of the Convention which would lack the capacity to adapt to the increasingly rapid and dynamic development of science and technology.

The credibility and efficiency of the Convention can only be enhanced by the participation of scientists. In particular, the Scientific Advisory Board will help to improve the standing of chemical disarmament in the eyes of governments, as well as of public opinion in general.

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*Further reading: France, working paper for the Conference on Disarmament, The Scientific Advisory Council, CD/916 of 17 April 1989.*

## DISARMING IRAQ — LESSONS FOR THE CHEMICAL WEAPONS CONVENTION

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The United Nations Special Commission on Iraq (UNSCOM) provides a unique experience in the world of arms control and disarmament. Much about the UNSCOM experience was unprecedented and may never be seen again. Therefore, the UNSCOM experience cannot be translated wholesale into traditional arms control and disarmament situations. Nonetheless, there are important lessons and meaningful parallels for other arms control regimes, particularly the Chemical Weapons Convention (CWC).

Proponents and opponents of the CWC alike can, and have, drawn from the UNSCOM experience to support their views. Meaningful comparisons can only be made by keeping the differences between UNSCOM and the CWC in perspective. The CWC and UNSCOM differ in their origins, objectives and execution.

The UNSCOM experience can be put in proper perspective by reviewing the key elements of the Iraqi disarmament that are unique. Unlike the CWC, UNSCOM was not the result of a mutually agreed upon treaty voluntarily entered into by States Parties for disarmament and confidence-building purposes. UNSCOM was imposed on Iraq as a punitive action against a belligerent. The United Nations (UN) Security Council Resolution unilaterally spelled out cease fire conditions, backed by the threat of resumed military action for non-compliance. From the outset there was a high degree of distrust.

UNSCOM had a broad mandate: the cease fire resolution required the destruction, removal or rendering harmless of three categories of weapons (chemical, biological, and nuclear) and one delivery system (ballistic missiles with a range greater than 150 km). This mandate applied not only to the weapons themselves, but to all related subsystems, stocks of agent, precursors, and to all research, development, support and manufacturing facilities. Iraq had no inherent right to retain anything of a dual purpose nature involved in and therefore tainted by a program for weapons of mass destruction. UNSCOM defined the terms of reference for its inspections. There was no item-by-item debate as to what was relevant — UNSCOM made these decisions and Iraq was obligated to comply.

UNSCOM was created at a time of unparalleled concentration of the will of the international community, creating unparalleled support for UNSCOM. This enabled UNSCOM to conduct the most intrusive inspection operations which were, as it turned out, necessary. Iraq was intent on concealing as much as it could, building upon its past ingenuity at undertaking clandestine operations. This environment was thus very different from traditional arms control and disarmament activities.

Under these circumstances, how successful was the Special Commission? I left UNSCOM in July 1992, just over a year after its establishment. At that time, Iraq's entire missile production program had been identified and, despite vigorous Iraqi resistance, destroyed. This destruction included a large number of buildings and advanced equipment. Also destroyed were *Scud* missile warheads and launchers, the supergun, and parts for a larger supergun. Facilities and equipment for uranium enrichment and nuclear weapons design had been identified and destroyed. All of the essential elements of the chemical weapons program had been identified, all unfilled munitions and chemical bomb casing manufacturing machinery had been destroyed, and actual weapons destruction was well underway. Today, less than two years later, this formidable task is almost complete.

An unfinished agenda item in July 1992 was the ascertainment of material balances for missiles and chemical weapons. For example, the total number of Iraqi *Scud* warheads and launchers can be calculated from the initial number provided by the Soviet Union, the number of cannibalizing modifications that were made in developing extended range warheads, and the number of missiles used in two wars. Such calculations required documentary evidence from Iraq and other sources to prove that everything was accounted for. Although information developed by UNSCOM indicated complete accountability, its evidence regarding the magnitude of Iraq's programs differed from pre-war estimates made by the intelligence services of some members of the Gulf War coalition. Without more detailed documentary evidence, Iraq's pattern of deception therefore ensured that a degree of uncertainty would persist. It should be pointed out, however, that at that time the tough compliance monitoring regime of Security Council resolution 715 had not yet been implemented.

Given the unique circumstances of the UNSCOM experience, what then are the meaningful parallels and lessons for the Organization for Prohibition of Chemical Weapons (OPCW)?

Those who are uncomfortable with the fact that the CWC will be administered by an international organization are associating the OPCW with the usually bureaucratic UN system. UNSCOM — a truly multinational UN operation — demonstrated that inspections conducted under the UN umbrella can be tough and effective. Resolve that the OPCW not be doomed to the ineffectiveness of some UN agencies can be seen in important CWC Preparatory Commission decisions on organization and staffing. Furthermore, there is a strong commitment among signatories to

hold the OPCW accountable for its operations and to ensure that it does not fall prey to bureaucratic pitfalls.

Unlike the OPCW, UNSCOM is a temporary organization. The eventual fate of its compliance monitoring mission notwithstanding, UNSCOM was formed with the specific task of quickly accomplishing its mandate. There was a tremendous sense of urgency, of common purpose and of acting on behalf of the entire world. This type of commitment keeps an organization focused. Former Warsaw Pact and NATO allies worked closely together on both the New York based planning staff and on the inspection teams in the field. This often overlooked post-Cold War phenomenon is probably one of the most significant outgrowths of UNSCOM. Some rather large barriers to East-West cooperation were broken. Apart from the sense of urgency and the temporary nature of the organization, the OPCW has these very same elements.

Another important lesson comes from UNSCOM's arms control and disarmament elements not being confused with a technical cooperation mission such as that conducted by the international Atomic Energy Agency (IAEA) to assist nations in developing peaceful uses of the atom. Since IAEA also conducts safeguards inspections, it arguably has a "split personality". This important distinction has apparently contributed to some of the institutionalized weaknesses of IAEA's nuclear safeguards regime. In contrast, the OPCW will not be excessively burdened with the management of technical assistance.

UNSCOM enjoyed unprecedented broad-based information gathering resources. Inspections were guided by international contributions of information and direct access to a wide array of surveillance assets. This intelligence cooperation, for the first time, cut across many historical, cultural and political lines that had been obstacles in the past. The broken barriers there will also benefit the OPCW. Shared intelligence will be essential in enabling the OPCW to keep vigilant watch on compliance with its provisions throughout the world.

Many important operational lessons can be transferred from the UNSCOM experience to the OPCW. These include lessons regarding team size, composition, technical and support skill requirements, operational security, data base management and assessment, mission planning and execution, training, and team leadership. In each of these areas, a wealth of directly applicable lessons is available as to what worked and what did not. These lessons are in fact receiving due consideration. Key participants from UNSCOM have joined the provisional OPCW Technical Secretariat. Additionally, national delegations to the OPCW Preparatory Commission, have brought to the Hague valuable lessons from their bilateral and national trial inspection experiences.

Before making further comparisons it is important to keep in mind the goal of the CWC and the role of the OPCW. The ultimate goal of the CWC is to abolish chemical weapons and the primary role of the OPCW is to help

nations comply with their mutual, voluntary commitment. Given this free-will commitment, it is not unreasonable to assume that States intend to abide by at least the letter of the law. This setting is quite different from the cops-and-robbers, cat-and-mouse scenario that, unfortunately, characterized the Iraqi disarmament. Nonetheless, the CWC's challenge inspection provisions are important because they give the OPCW the ability to resolve grave concerns. Challenge inspections will be the exception — not the rule.

The principal concern regarding challenge inspections is that they will cause the loss of sensitive information critical to national defense and industrial competitiveness. The inspectorate, some fear, will be staffed with personnel whose real mission is strategic or industrial espionage, so that challenge inspections may be used for the purpose of gathering intelligence or proprietary information. There is genuine concern that no matter what protective measures we take we are going to lose something. For the most part, I find that there is no need for such apprehension.

First of all, after participating in a number of mock and national trial inspections at Department of Defense sites throughout the US, I am confident that with managed access sensitive defense information can be protected while still resolving the compliance concerns of the State Party requesting the inspection. The ability to do this requires training and preparation. For the US, this is not something new. We have already had experience in protecting unrelated sensitive information while still accommodating inspection under other bilateral and multilateral agreements.

Second, the OPCW will be ever aware that its professionalism, objectivity, and reputation with the international community are at stake in everything it does. Misbehavior on the part of OPCW inspectors should not be a concern. As there was with UNSCOM, you can be assured that the OPCW will be conscientious in its "self-policing." The OPCW simply cannot risk jeopardizing the confidence and financial support of its member nations.

Some persons question the merits of challenge inspections and whether or not the OPCW could ever realistically expect to catch a cheater. UNSCOM proved that a cheater can be caught. Iraq tried to hide calutrons and all other aspects of its uranium enrichment and nuclear weapons design program. Iraq's attempt to retain a number of *Scud* missile warheads, launchers and chemical weapons, evidenced by their exclusion in the initial declaration, was uncovered. UNSCOM also caught Iraq attempting to retain chemical bomb casing manufacturing machinery by keeping it in a sugar factory.

Admittedly, the truly no-notice nature of the inspections contributed to this success. But the key element was gaining access to the site.

It is not true that inspections must be no-notice whatever in order to detect a violation. And it is certainly not true that a verification exercise in which the inspected party intentionally reveals nothing is likely to be futile. Iraq had

months to clean up the many sites that were obvious candidates for inspection. To an impressive degree, a trained inspector can determine when something is not right. In Iraq, we could determine which facilities had legitimate enterprises and which had significant evidence to indicate a cover-up or a situation for which the explanations given were not entirely convincing. Suspicious activities can be discerned, and it is then up to the inspected State Party to demonstrate compliance.

Furthermore, it is short-sighted to demand a smoking gun as a measure of success in catching a cheater. The inspections centered on the Iraqi biological-warfare program did not uncover the “smoking gun” many had expected — that of weaponized biological agents. However, the facts in evidence and an assessment of the findings did provide a picture of where the Iraqis were in this effort, along with a reasonable determination of where they were headed. At the very least, identifying a situation for which there remains serious doubt will focus the OPCW’s monitoring effort and thwart the efforts of a would-be violator.

Finally, there is the assertion that the OPCW will not get anywhere with a non-cooperative party. Iraq undoubtedly has earned that distinction. Ingeniously deceptive, Iraq put obstacles in the road every step of the way. In spite of those obstacles the objectives of the inspections and the aims of the Security Council resolution were accomplished. There is an important lesson here for evaluating verification regimes.

In judging the UNSCOM experience, the manner in which the obstacles were overcome demonstrated that the verification and control system applied was not merely a fair-weather one. Without the obstacles, we would not be in a position to assess whether the system was strong enough — an uncontested system would be an untested system. The extent to which it was tested only proves the degree to which it was successful.

In determining whether other verification systems will have the requisite tools to make them strong enough — the first item on the inventory should be on-site inspection. As important as on-site inspection is, no verification tool can stand alone. It is the synergy of on-site inspection combined with good intelligence, thorough analysis of all the puzzle pieces, and strong political resolve that makes a verification regime successful.

One thing the Iraqi situation clearly demonstrated was that we cannot underestimate the role of political crises in achieving arms control and disarmament agreement aims. A crisis shakes the international community out of its lethargy, grabs its attention and galvanizes it into action. The CWC has a good chance of succeeding in its ultimate goal of abolishing chemical weapons — as long as the States that ratify it are serious about enforcing it, thereby establishing a strong international norm. □

## CWC Non-Signatory States

*as of 1 June 1994*

Angola  
Botswana  
Chad  
Egypt  
Lesotho  
Libya  
Mozambique  
Sao Tome & Principe  
Somalia  
Sudan

Bhutan  
Iraq  
Jordan  
Kiribati  
Lebanon  
North Korea  
Solomon Islands  
Syria  
Taiwan  
Tonga  
Tuvalu  
Vanuatu

Bosnia-Herzegovina  
Macedonia, FYR of  
Uzbekistan  
Yugoslavia

Antigua & Barbuda  
Barbados  
Belize  
Grenada  
Jamaica  
Suriname  
Trinidad & Tobago

Andorra  
Monaco

*157 states have signed the CWC and 8 have deposited instruments of ratification*

## Building the Organization for the Prohibition of Chemical Weapons

### **Actions by the PrepCom**

The Preparatory Commission for the Organization for the Prohibition of Chemical Weapons (OPCW) reconvened for its sixth plenary session in the Hague during 11-15 April 1994. The Commission continued its work on detailed verification procedures for implementation of the Chemical Weapons Convention (CWC) and on the organizational foundations for the future OPCW. The Sixth Plenary was able to take action on a wide range of matters on which decisions had been prepared by its two Working Groups (A on Administrative and Organizational matters, and B on Verification and Technical Cooperation and Assistance) and their eighteen Expert Groups which had been active during the first three months of 1994. Key PrepCom actions included:

- Adoption of criteria to be used in evaluating the adequacy of complementary bilateral and multilateral verification procedures at chemical weapons storage and destruction facilities.
- Adoption of guidelines for verification activities at CW destruction facilities.
- Approval of understandings on three matters related to chemical industry facilities (methods for risk assessments of schedule 2 facilities, for determining the frequency, duration and intensity of inspections, and for verification at 'mixed plant sites').
- Expression of concern about the 'lack of progress in the Expert Group on Chemical Weapons Production Facilities and at the serious nature of existing differences on key issues' including verification activities, inspection equipment and criteria for conversion of such facilities.
- Approval of a detailed set of requirements for the future OPCW Building and initiation of a design competition for the new building among architects from the Netherlands, Spain and the United States.
- Acceptance of the Financial and Staff Rules as prepared by the Executive Secretary.
- Adoption of a security policy for the OPCW Data System, of a confidentiality classification system for the OPCW, and of provisions for applying the confidentiality system to PrepCom data.
- Adoption of training guidelines for courses of member states which will be conducted as part of the OPCW's General Training Scheme.
- Approval of a document spelling out the OPCW's Health and Safety Policy and its applicability to the Commission.
- A request to the UN Secretary-General, as depositary of the CWC, to correct clerical errors found in the certified copy of the Convention.
- A request to member states for comments on an updated Industrial Declarations Handbook prepared by the Provisional Technical Secretariat (PTS).
- Reduction of the number of Expert Groups and endorsement of a set of recommendations on their improved functioning.

As a result of the last item above the work carried out by the eighteen existing Expert Groups will be consolidated under ten such groups, making it easier for delegations to follow and contribute to their proceedings. The Groups will now normally have a one day break in the middle of each week of meetings, to facilitate the holding of informal consultations and the preparation of papers for consideration.

Despite agreement on the items mentioned above a growing number of disputes over substantial matters surfaced at the Sixth Plenary. Whereas at previous sessions controversy centered largely on administrative issues, such as the use of languages, budgets and the distribution of jobs in the PTS, controversial items at the April Plenary involved key aspects of CWC implementation and in some cases reopened old issues which had been presumed resolved in the text of the Convention itself.

Issues addressed at the Sixth Plenary and in its Working Groups which remained unresolved at the session's close, include the use of a 'filter' for approval of challenge inspection requests, access within the perimeter of facilities subject to challenge inspections, the right of states to impose export controls on non-scheduled chemicals, the use of inspection equipment capable of detecting treaty-relevant non-scheduled chemicals at a facility and a proposal for ensuring geographic balance within inspection teams. The meeting also failed to overcome differences on several issues related to the scope of industrial obligations under the treaty. These include (1) criteria for declaring products containing low concentrations of schedule 2 or 3 chemicals, (2) the question of whether plants processing castor beans, from which the schedule 1 chemical ricin can be extracted, should be declared as CW production facilities, (3) whether facilities previously engaged in production of schedule 1 chemicals for pharmaceutical purposes should be declared as former CW production facilities and (4) a decision on which 'discrete organic chemicals' and 'PSF Chemicals' are covered by the Convention's verification regime.

Many participants viewed the shift of attention from organizational issues to substantial matters as an encouraging

development, reflecting a growing awareness in capitals of the impending entry into force of the CWC and of the concrete ways in which the Convention will affect their interests. Others viewed the growing list of substantive disputes as a sign of drift in the Commission's work and of the need for renewed attention to the chemical disarmament process from a high political level. For many signatory states which did not participate actively in the CWC negotiations, the Commission provides the first experience of grappling with certain issues which the treaty's intrusive verification regime entails. However any delays in resolving key issues, particularly those related to industrial obligations, are likely to set back planning for entry into force and complicate efforts of ministries and industrial organizations to prepare to meet their obligations.

Despite its preoccupation with more substantive matters the Commission continued to involve itself in what some consider to be internal management matters of the PTS. The Asian and Latin American Groups requested Ian Kenyon, the Executive Secretary, to begin publishing the grade and step levels of PTS staff, an unusual request which the Executive Secretary has so far declined. The Asian group also requested that the 'particulars of successful candidates' be circulated. As a result of what some delegations considered to have been insufficient consultation, the Commission was unable to approve a package of 12 staffing adjustments which the Executive Secretary had identified as 'essential for preparing efficiently for entry into force of the Convention and for managing the basic responsibilities of the Secretariat'.

The April Plenary was attended by only 79 of the then 157 CWC signatory states, putting the session only one member above the level at which it would have been without a quorum. The session was the first for the Commission's new chairman, Ambassador Grigory Berdennikov of the Russian Federation, who will continue in the chair at the Commission's seventh session from 27 June to 1 July 1994.

### **Actions by Member States**

Three additional states, the Bahamas, Saint Kitts and Nevis, and Tanzania, signed the CWC during the period between December 1993 and the April PrepCom session, thus raising the total number of signatories to 157. At that time the only new instrument of ratification deposited was that of Norway. By 1 June additional instruments of ratification were deposited by Albania and Australia, bringing the total to seven of the sixty-five ratifications required to trigger entry into force.

The slow pace at which ratifications were being received emboldened the Executive Secretary to raise officially for the first time 'the possibility that the deposit of the sixty-fifth instrument of ratification...may not be reached by the date of 16 July 1994, which is the current assumption built into the 1994 Programme of Work and Budget'. It is likely that this assumption will be officially changed at the Seventh Session of the Commission in June.

A large number of states reported at the time of the Sixth Plenary, either formally or informally, that preparations for ratification were well underway in their capitals and that they expected to have ratified the Convention by the end of 1994. The final report of the Plenary contains predictions by Bulgaria, Germany and the United States that their respective ratification procedures will be completed as early as mid-1994. Mexico reported on plans to ratify during 1994, while Romania expressed its hope to be among the first 65 ratifying states.

In a special message to the Commission, Russian Foreign Minister Andrej Kozyrev stated that the Russian Duma had begun preparations for ratification, while making it clear that ratification would be linked to agreement on a 'concept for chemical weapons destruction' and the effective use of limited Russian financial resources. The Russian representative, in a separate written statement circulated at the plenary, amplified his Minister's statement, raising a wide range of issues which he said would 'have a considerable impact on the outcome of the deliberations' on CWC ratification in the Duma. These issues included allocation of financial resources, arrangements for conversion of CW production facilities, and the sharing of verification costs between the inspected state and the OPCW. He also warned against what he considered to be efforts at the PrepCom to reinterpret provisions of the CWC which had been settled in the Geneva negotiations, particularly on matters relating to challenge inspections and certain key definitions.

The United States and the Russian Federation jointly submitted to the Commission a copy of their 14 January 1994 understanding which provides for a detailed information exchange on their respective CW capabilities and for routine and challenge inspections at CW related facilities of the other state. The 'understanding' was a follow-up to the US-Soviet agreement reached in Wyoming in September 1989 concerning the declaration, inspection and partial destruction of US and Soviet CW stockpiles. Declarations and inspections under the January 1994 agreement are to be completed before the end of 1994.

Western Samoa became the third signatory state, after Lithuania and Vietnam, to announce that it was unable to continue its participation in the PrepCom and to request that its financial responsibilities to the Commission cease. In a report on this recurring problem the Executive Secretary noted that signature of the Convention constituted *ipso facto* membership in the Commission and reminded the Commission of its previous decision that its budget would be financed by all member states. The Executive Secretary has recommended that the PrepCom arrange for the first Conference of States Parties of the OPCW to address, among other issues the assessment of the amount due from states which are in arrears in their contributions.

In a direct challenge to states members of the Australia Group, which coordinates CBW-related export controls, the government of Iran called on the PrepCom to critically examine the contents of an earlier Australian paper on na-



tional implementation which asserts that signatory states have a responsibility to control the export of non-scheduled chemicals which could be of use in CW armaments programs. While Iran claims, in a document submitted to the Sixth Plenary, that Article XI of the CWC should ensure the 'free and unhampered transfer of chemicals' for peaceful purposes, the Australian position builds on the duty of states, under Article I, not to 'assist...anyone to engage in any activity prohibited to a State Party' and on the sovereign right of states to determine their own national export policies. Although no action on this issue was taken by the PrepCom, this controversy highlights an area of intentional ambiguity in the Convention, resulting from compromises reached in the final stages of its negotiation.

### ***Progress in the Provisional Technical Secretariat***

As of early April, 91 of the 120 PTS posts authorized for Phase I of the 1994 budget had been filled and recruitment for an additional 16 positions was underway. The 13 remaining posts must remain unfilled until 7 months before entry into force. The Executive Secretary reported that 31 nationalities were now represented in professional posts, an increase of 6 since the previous session with the addition of staff from Bangladesh, Cuba, Israel, Morocco, New Zealand and the Slovak Republic. He also reported problems in recruiting staff due to the uncertain term of service being offered and had issued a statement providing conditional assurances to staff concerning renewal of their contracts and the possibility of future employment with the OPCW.

Political debate in the PrepCom over PTS posts continued to affect the work of the Secretariat, even at lower levels in the organization. Of twelve post adjustments deemed essential by the Executive Secretary the PrepCom could agree on only three minor changes. Though all staffing adjustments were within existing budgetary limits some delegations objected to the lack of consultation, others took the opportunity to promote their own respective candidates and yet others used the occasion to express concern about regional imbalances in the Secretariat. As a result, nine posts will remain unfilled at least until after the June Plenary. These include a receptionist, security officer, procurement clerk, archivist and an officer responsible for OPCW building matters (a post previously recommended by the Committee on Relations with the Host Country). The impasse over such essential functions will further increase pressure on existing personnel, particularly among support staff, many of whom are already working considerable amounts of overtime.

The Secretariat reported an increase in outreach activities during the first quarter of 1994. This involved intensified contacts with member states, other international organizations and the chemical industry. Executive Secretary Ian Kenyon had, since the beginning of the year, visited officials from government, industry and research institutes in Asia (China, Indonesia, Japan, South Korea, Singapore and Thailand) and Scandinavia (Finland, Norway and Sweden), discussing the Commission's work and identifying ways in which the PTS could assist in solving practical problems of CWC implementation. Other PTS staff had

been engaged in contacts with the UN Economic Commission for Europe, a committee on dangerous goods transport of the UN's Economic and Social Council, and the UN Special Commission on Iraq (UNSCOM).

Internally, a special task force to coordinate industry outreach was established with Raúl Fernández, Industry Officer in the External Relations Division, as its contacts coordinator. The task force will coordinate PTS contact with industry and the production of written material on industry implementation. Where direct contacts between industry and particular staff members already exist, the task force will help ensure consistency in information being provided. In other cases Mr. Fernández will be the first point of contact, will direct requests to the appropriate substantive officer, and is responsible for the distribution of information materials to industry.

As part of its outreach to industry the Secretariat prepared a second meeting between industry officials and the Expert Group on Chemical Industry Facilities, which took place 27-28 April in the Hague. The gathering, which drew participants from 34 countries and the European Chemical Industry Council, attracted industry officials from 14 countries. It also provided for more 'give and take' between industry and the Commission than had the previous meeting in November 1993. Topics covered included confidentiality, operational and safety issues and reporting and administrative arrangements.

In cooperation with the Thai and Australian governments the PTS organized a third regional seminar on national implementation in Bangkok on 9 and 10 May. At the event, which brought together 70 participants from 15 countries, the PTS and non-governmental organizations, a representative of the Harvard Sussex Program spoke on 'The general obligations of a National Authority'. A fourth regional seminar was hosted by the government of the Czech Republic in Brno during 1-2 June which brought together 48 participants from 19 states, research institutes and non-governmental organizations. Preparations are continuing for seminars in Peru (1-3 September), Indonesia, and possibly in South Africa.

The Hague Academy of International Law, in cooperation with the PTS and the UN Institute for Disarmament Research, will be sponsoring a colloquium in November on 'The Convention on the Prohibition and Elimination of Chemical Weapons: A Breakthrough in Multilateral Disarmament'. At the seminar a group of invited international legal and other experts will address a number of issues related to the work of the PrepCom.

### ***Progress in Other PrepCom Structures***

As a result of a decision of the Sixth PrepCom the work of a number of Expert Groups, particularly those relating to chemical weapons facilities and the chemical industry, will be merged in the future. This is intended to make it easier for delegations to follow discussions on particular topics, reduce the amount of overlap between different Expert Groups and improve the coordination of proceedings. The

ten Expert Groups which resulted from this restructuring, effective from 18 April, are as follows:

Under Working Group A:

- Administration, Finance and Personnel
- Data Systems
- Headquarters Agreement
- Program of Work and Budget

Under Working Group B:

- Challenge Inspections and Alleged CW Use
- Chemical Industry Issues
- Chemical Weapons and Associated Issues
- Confidentiality
- Inspection Procedures
- Technical Cooperation and Assistance

During the intersessional period between the December and April PrepCom Plenaries a record number of eighteen Expert Groups convened in the Hague, six under Working Group A and twelve under B. A summary of their work for the period is provided below, with the first six groups being those operating under Working Group A.

*Staff and Financial Regulations* (Chair: Sarvajit Chakravarti of India). This Group reviewed the staff and financial rules prepared by the Executive Secretary, found them to be consistent with the Staff and Financial Regulations and reported to the Commission on its findings. Further work on Staff and Financial Regulations for the OPCW will be carried out by the group on Administrative, Financial and Personnel Matters following the Seventh Plenary.

*Transitional Arrangements* (Chair: I.M. Bindawa of Nigeria). The first report of this body covered issues involved in the transfer of functions, property, legal obligations and staff from the PrepCom to the OPCW. The Group made recommendations on various matters to other Expert Groups and to the Committee on Relations with the Host Country. It may be convened in the future when the Executive Secretary identifies particular issues for consideration.

*OPCW Building* (Chair: Radoslav Deyanov of Bulgaria). This Group's final report to the Commission included a draft Program of Requirements for the permanent OPCW Building, which was subsequently endorsed by the Commission. It also addressed security standards for the future OPCW premises and identified requirements which could be suspended during the period in which the OPCW may need to be housed in interim accommodation.

*OPCW Headquarters Agreement* (Chair: Natalino Ronzitti of Italy). The first meeting of this body considered matters to be addressed in the future Headquarters Agree-

ment between the OPCW and the Netherlands and reviewed similar agreements involving other international organizations. It recommended that the Secretariat prepare a draft agreement which it will consider at its next meeting following the June Plenary.

*Data Systems* (Chair: Olivier Caron of France). This Group further elaborated requirements for the OPCW's Information Management System (IMS) and agreed on principles for the OPCW's computer security policy, both of which were subsequently adopted by the Commission. At its suggestion the Executive Secretary was authorized to set up a Task Force including national experts, PTS staff and, if needed, consultants to assist in completing the development of the IMS.

*Program of Work and Budget* (Chair: Jorge Morales of Cuba). Based on the intersessional work of this body the Commission approved a Calendar for 1994 work on the 1995 Budget and a proposed structure for the 1995 budget.

*Confidentiality* (Chair: Antony Taubman of Australia). This body completed work on the 'Draft OPCW Classification System for Confidential Information' which was accepted by the Commission and will also be used by the PrepCom. It will continue work on responses to breaches of confidentiality, a Commission to settle confidentiality disputes and the 'information release procedures' of the OPCW.

*Technical Cooperation and Assistance* (Chair: Sarvajit Chakravarti of India). For the first time this group discussed practical ways in which Article XI of the CWC, pertaining to the promotion of free trade and international cooperation in the peaceful use of chemicals, could be implemented. Specific roles for the Conference of States Parties, the Executive Council and Technical Secretariat were considered. Meetings also focussed on a model bilateral agreement for the procurement of assistance and on formats for declaring (a) national protective programs and (b) the types of assistance which could be made available to states attacked or threatened with CW.

*Challenge Inspections* (Chair: Andrea Perugini of Italy). This Expert Group grappled with a number of sensitive issues which it was unable to resolve, including how to determine abusive use of the right to request a challenge inspection, the type of information to be provided with such a request, the type of access which is required within the perimeter of an inspected facility and the role of the Executive Council in processing a request. Additional issues such as the choice of language for the conduct of inspections, inspection team equipment and privileges and immunities for inspection teams were also addressed.

*Chemical Industry Facilities* (Chair: Adam Noble of the United Kingdom). Understandings on risk assessment of schedule 2 plant sites, verification at 'mixed plant sites' and factors to govern the frequency, duration and intensity of inspections were developed by this body during its intersessional meetings and in consultations by its chair. The

body also reviewed the Declarations Handbook prepared by the PTS. It is hoped that it will be able to complete work on the controversial matters such as castor bean processing plants and past schedule 1 production at pharmaceutical facilities (listed in section 1 above) by the time of the seventh PrepCom plenary.

*Declarations and Model Facility Agreements* (Chair: Heinrich Beuth of Germany). This group focussed its work on the draft Declarations Handbook being prepared by the PTS and on further elaboration of model facility agreements for industrial facilities. It identified a number of legal problems concerning the legal status of facility agreements and the importance of an OPCW policy on relations with the news media as regards the release of information on industrial sites.

*Chemical Weapons Production Facilities* (Chair: Graham Cooper of the United Kingdom). Disagreements on criteria for conversion of CW Production Facilities to peaceful production, on the definition of 'production capacity' and on the precise inspection activities to be permitted were among the matters blocking agreement in this working group. Efforts to resolve these issues will continue both in the US–Russian context and in consultations conducted by the chairman. The group did complete its appraisal of a list of inspection equipment required for CWPFs.

*Chemical Weapons Storage Facilities* (Chair: James Knapp of Canada). This group developed criteria, later adopted by the Commission, for assessing the applicability of bilateral or multilateral verification arrangements which the OPCW may authorize as complementary to OPCW verification arrangements. It also worked on a model facility agreement.

*Chemical Weapons Destruction Facilities* (Chair: Patrick Dewez of France). Guidelines for four types of inspection activities and for judging the adequacy of bilateral verification arrangements were developed by this body and later adopted by the PrepCom. Guidelines and deadlines for the provision of detailed facility information were also produced and approved. Work is continuing on the definition of the 'destruction end point', the quantification of agents destroyed and how to deal with CW destruction processes which produce schedule 2 chemicals.

*Old and Abandoned Chemical Weapons* (Chair: Peter Krejsa of Austria). This group prepared usability and risk criteria to be applied to old chemical weapons produced between 1925 and 1946 and produced guidelines for initial inspections of old CW sites. The Commission requested that work on the regime for old and abandoned CW, including recommendations on the sharing the cost of verification, be completed before its next plenary session.

*Equipment* (Chair: Henk Boter of the Netherlands). This body reported considerable progress in identifying inspec-

tion equipment to be purchased for the OPCW and outlined specific steps in the procurement process. It also developed criteria for laboratories to be used by the OPCW and continued work on the OPCW's Quality Assurance Program and its Quality Control System. The PTS Executive Secretary was asked to seek from member states the names of laboratories or other facilities which could assist the PTS in evaluating major items of laboratory or inspection equipment.

*Training* (Chair: Benham Behrooz of Iran). Based on the work of this group the Commission was able to adopt guidelines for the certification of training courses offered by member states as part of the OPCW's General Training Scheme. Given the uncertain date of the CWC's entry into force planning for the commencement of inspector training has been difficult. The group has asked the PTS and member states offering training courses to liaise closely to determine when courses could be conducted in late 1994 and 1995. As of 11 April only 17 applications had been received for the 215 inspector trainee positions. In light of this the deadline for applications was extended and the Secretariat is conducting a salary survey to compare projected OPCW inspector salaries with those of industry and other international organizations utilizing staff with equivalent qualifications. It will also request an increase in its budget for 1995 for expenses related to advertising and recruitment.

*Safety Procedures* (Chair: Ray Fatz of the United States). This body provided the PrepCom with a final draft of the OPCW's Health and Safety Policy, which was subsequently adopted. Work will continue on the associated Health and Safety Regulations and Technical Guidelines and on procedures for medical screening of OPCW inspector candidates. The group also prepared an outline of the training course for OPCW medical personnel.

In addition to its Working Groups and Expert Groups the PrepCom has also spawned a Finance Group and a Committee for Relations with the Host Country. The *Finance Group*, consisting of financial experts from national governments, held its first meeting on 3 March at which it developed guidelines for preparation of the 1995 PrepCom budget. The *Committee on Relations with the Host Country* held three meetings during the intersessional period at which it considered options for permanent and interim accommodation for the PTS and OPCW, privileges and immunities for delegates and staff, and the problem of obtaining a suitable conference facility for the first conference of states parties — given that the exact date may not be known until nearly six months in advance. The Committee intends to make a recommendation to the June Plenary on whether to proceed with a tailor made OPCW building or to house the OPCW in an existing building in the Hague. This decision will, in turn, determine the size and duration of interim accommodation needed for the PTS and/or the future OPCW Technical Secretariat.

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*This review was written by Peter Herby*

What follows is taken from the CBW Events data-base of the Sussex Harvard Information Bank, which provides a fuller chronology and more detailed identification of sources. The intervals covered in successive Bulletins have a one-month overlap in order to accommodate late-received information. For access to the data-base, apply to its compiler, Julian Perry Robinson.

**1 February** In Moscow, the Vernadskiy Institute of Geochemistry and Analytical Chemistry is reported by *Izvestiya* to be the location of the projected Central Chemical Weapons Destruction Analytical Laboratory which the United States is to provide in Nunn-Lugar assistance [see 9 Jun 93]. As accepted during the Moscow summit [see 14 Jan], more than half of the nearly \$30 million agreed with the President's Committee on CBW Convention Problems for the laboratory is to go on instruments and equipment. {*Izvestiya* 1 Feb in JPRS-TND 25 Feb}

As for the long-awaited selection of a US contractor to assist Russia, under the Nunn-Lugar programme, in preparing a comprehensive chemdemil implementation plan [see 30 Jul 92], a spokeswoman for the US Defense Department has recently said that the request for proposals is to be released within the next two weeks. The contractor will work out of the US Chemical Weapons Destruction Support Office in Moscow [see 9 Jun 93]. {*Aerospace Daily* 27 Jan} Release of the RFP is still being awaited two months later. {*National Defense* Apr}

**1 February** In Moscow, the head of the public relations department of the President's Committee on CBW Convention Problems, Igor Vlasov, says on radio that the amount of Russia's chemical weapons inherited from the former USSR is 40,000 tonnes of toxic substances, including 32,200 tonnes of organophosphorus toxic substances stored in aviation, missile and artillery charges, and 7700 tonnes of skin-affecting toxic substances, such as mustard gas, lewisite and mixtures thereof [see also 8 Dec 93]. {*Mayak Radio* 1 Feb in BBC-SWB 12 Feb} In a later radio interview, he repeats this and says: "The places where they are stored are the town of Shchuchye in Kurgan Oblast, the settlement of Kizner in Udmurtia, the settlement of Maradykovskiy in Kirov Oblast, the settlement of Leonidovka in Penza Oblast and the town of Pochep in Bryansk Oblast. In the town of Kambarka (in Udmurtia) there is a storage facility for lewisite, and in the settlement of Gornyy in Saratov Oblast there is a small amount of toxic agents such as mustard gas, lewisite and their mixtures." {*Mayak Radio* 4 Feb in BBC-SWB 9 Feb}

Vlasov had published these details in *Rossiyskaya Gazeta* immediately after the Moscow Summit [see 14 Jan], introducing them as follows: "The problem of the destruction of chemical weapons has alarmed the country's public. The sociopolitical situation has been sharply aggravated in the regions where it is planned to site installations for the destruction of the chemical weapons arsenal, and certain representatives of social movements are trying to exploit the currently fashionable topic of chemical disarmament in their own interests. Journalists are citing unverified facts, and people weighed down with science degrees are now trying to draw attention to themselves by making revelatory statements. The press increasingly often carries articles in which so-called chemical weapons experts who like to pose as major specialists try to intimidate the public with reports on the alleged continuation of scientific research into

chemical weapons, their unauthorized destruction, secret burials on land and in water...". {*Rossiyskaya Gazeta* 15 Jan in JPRS-UMA 9 Feb} Further particulars of the stockpile, and similarly acerbic comments on publicists such as Dr Lev Fedorov [see 8 Dec 93], had been given by the chief of the Committee's CW department, Professor Aleksandr Gorbovskiy, in an interview for *Nezavisimaya Gazeta* {27 Jan in JPRS-TAC 7 Mar}.

**1-11 February** In Iraq the thirteenth UN chemical inspection team, UNSCOM 67, led by Horst Reeps of Germany and numbering 10 people, some of whom are now with the PTS in The Hague, visits sites containing dual-purpose chemical production equipment: Al Muthanna, Fallujah I, II and III, and the new Ibn al Baytar pharmaceutical facility, currently under construction in support of Samarra Drug Company. The team also receives further declarations of information from the Iraqi side, including an account of past research conducted into the production of BZ-type hallucinogens and nitrogen mustards. The team identifies and tags 223 items of dual-use equipment pending decision on conversion or destruction. {UN doc S/1994/489} Speaking at the end of the mission, Chief Inspector Reeps tells reporters: "Our main aim was to get more information on the planned use of this equipment in the future. Iraq has said it intends to make use of them for the production of pesticides, pharmaceuticals and other chemicals". He says, further, that some of the equipment had never been used, some used on a regular basis, and some would be the subject of new discussions with the Iraqis on their planned use. {AP 30 Jan; AFP 11 Feb in BBC-SWB 15 Feb}

**2 February** In Jakarta, the director of International Organization Affairs in the Indonesian Foreign Ministry, Hasan Wirayuda, states at a press conference that Indonesia is planning to ratify the CWC by the end of 1994. An interdepartmental committee is preparing for the ratification, comprising representatives of the ministries of industry, defence and security, trade, and health, the Armed Forces Headquarters, the Agency for the Assessment and Application of Technology, and Surveyor Indonesia Co Ltd. {*Antara* 3 Feb in BBC-SWB 5 Feb}

**2 February** In Washington, the French Embassy hosts a symposium on Peacekeeping and Humanitarian Assistance. A US Army officer from Fort Benning, Lt-Col Michael Smith, speaks in his presentation of an Army priority requirement for nonlethal weapons, saying in particular that an alternative to CS gas is needed for crowd control and disabling combatants. He goes on to list a variety of other nonlethal technologies [see 24-28 Jan] in which the Army is interested. {*Defense Daily* 3 Feb}

**2-5 February** UNSCOM Executive Chairman Ekéus is in Iraq for a new round of high-level talks [see 22 Nov], including technical talks [see 30 Nov], about the preconditions for lifting the

UN embargo [see 17 Dec 93]. {AP 6 Feb; *New York Times* 13 Feb} In a joint end-of-talks statement, he and Iraqi Deputy Prime Minister Tariq 'Aziz say that both sides "expressed their readiness to expedite the process of establishing ongoing monitoring and verification in a spirit of goodwill, in order to achieve their joint objective". There is to be another round of high-level talks during the first half of March. {INA 6 Feb in FBIS-NES 7 Feb; AFP 7 Feb in FBIS-NES 8 Feb; UN doc S/1994/151}

Ambassador Ekéus visits Kuwait after leaving Iraq. Television there reports him as stating that, as regards Iraqi chemical weapons, UNSCOM did not feel reassured: there was still a lack of complete information from Iraqi officials which would enable the Commission to confirm that all these weapons had been destroyed or removed. Kuwait Radio later reports him as saying that, as regards the Iraqi biological-weapons programme, UNSCOM was relatively confident, but not fully satisfied, that all the essential elements had been treated. {Radio State of Kuwait 7 Feb in BBC-SWB 9 Feb; Reuter in *Washington Times* 7 Feb}

**3 February** The US firm Raytheon Engineers & Constructors, as part of a consortium headed by the German concern Lurgi Umwelt-Beteiligungs Gesellschaft [see 11 Nov 93], has obtained a contract from the Russian government for the development of a concept for, and a prototype of, a chemdemil plant to be built in Saratov Oblast. The firm's press department says that the concept for the enterprise should be ready in March. Development of the concept is being financed by the Federal German government, which has allocated DM 3.2 million for the purpose. {ITAR-TASS 3 Feb in BBC-SWB 8 Feb; *Aviation Week & Space Technology* 14 Feb} The consortium has been established in order to build chemdemil facilities in Russia. Its other members are Uhde GmbH, a branch of Hoechst AG, Entsorgung und Sanierungstechnik, and a subsidiary of Deutsche Aerospace. {ITAR-TASS 3 Feb in FBIS-SOV 7 Feb}

**4 February** In Moscow, the trial of Dr Vil Mirzayanov [see 28 Jan] resumes. ITAR-TASS reports that President Yeltsin has been briefed in detail on the case by his national security adviser Yuriy Baturin, who had himself spoken at length with Dr Vladimir Uglev [see 24 Jan] and talked to the news agency about the "anticonstitutional" character of the trial — and the possibility, therefore, of it being cancelled. {*Moscow News* 4-10 Feb}

**4 February** In Washington, the National Research Council issues the recommendations on chemdemil developed by its Committee on Review and Evaluation of the Army Chemical Stockpile Disposal Program [see 10 Jun]. {*Chemical & Engineering News*, 14 Feb} Under the 1993 Defense Authorization Act [see 1 Oct 92], the Army now has 60 days to submit to the Congress its own assessment of alternatives, suitably reflective of the NRC recommendations.

The lead technology currently being developed for chemdemil by the Army is embodied in the Johnston Atoll Chemical Agent Disposal System (JACADS) [see 25-26 May 93]. This system separates stockpiled items into four different streams. These are: liquid chemical agent; energetics (explosives and propellants) and small metal components; large metal components; and dunnage. Each stream is processed in a separate incinerator, with treatment of effluent gases to remove solid particles and gaseous pollutants. Brines from the treatment process are concentrated by evaporation and stored for land burial. Possible alternatives to the system are what the

NRC committee has been considering. Its recommendations include the following:

- Disposal should continue on schedule with the existing system, unless and until alternatives are developed and proven to offer safer, less costly, or more rapidly implementable technologies, without sacrifice in any of these areas.
- Any disposal system should be designed to process separately liquid chemical agent, energetics, metal parts, and dunnage. The cryofracture process precludes such separate processing and the Committee does not recommend it.
- Consideration should be given to the addition of activated charcoal filters for removing traces of organic pollutants from gaseous incinerator effluents.
- There is no acceptable alternative to incineration for treatment of energetics and metal components.
- As an alternative to the present technology, chemical neutralization should be examined as a possible first step for destruction of liquid chemical agent.
- Chemical neutralization of agent GB is an established technology. Chemical neutralization of agent VX and mustard is presently under study.
- The products of chemical neutralization of liquid chemical agents will require further treatment before ultimate disposal. Four alternative procedures for possible use following chemical neutralization are recommended for consideration. These are (1) incineration; (2) high-temperature, high-pressure wet air oxidation, possibly followed by biodegradation; (3) supercritical water oxidation; and (4) biodegradation. Except for incineration, each of these follow-on processes is in the stage of research or development. {*NRC Recommendations for the Disposal of Chemical Agents and Munitions*}

The Army now seeks reports on the recommendations from each of the Citizens' Advisory Commissions in the stockpile regions, by the end of the month. {*Star* (Anniston) 11 Feb} Opposition to the recommendations is later expressed by Greenpeace and by local groups coming together in the Kentucky-based Chemical Weapons Working Group. {*Chemistry & Industry* 7 Mar; *CWC Chronicle* May} Common Ground, funded by the Kentucky Environmental Foundation, states: "For an independent, scientific agency, the NRC reported little that was either independent or scientific. Their contradicting conclusions are based on past Army documentation, and the overall tone of the report rings with the Army's influence." {*Common Sense* Mar}

**7 February** In Bosnia-Herzegovina, "chlorine-based toxic gases" are fired into Croat-held areas around Novi Travnik during artillery and mortar attacks by the Bosnian Army, according to Radio Croatia. {7 Feb in JPRS-TND 25 Feb}

**7 February** In the UK, the Director-General of the Chemical and Biological Defence Establishment at Porton Down responds as follows to a Parliamentary question about experiments involving human beings at his establishment [see 27 Jan]: "The role of the CBDE is to ensure that the UK Armed Forces have effective protective measures against the threat that chemical or biological weapons may be used against them. In order to carry out this work, it is necessary to use volunteers to: (a) assess the ability of Service personnel to function with new equipment and procedures, (b) develop medical countermeasures to protect Service personnel, and (c) evaluate the effects of very low and medically safe concentrations of CW agents on the ability of unprotected personnel to operate nor-

mally. No studies involving volunteers are carried out unless there is a clear military need and a detailed protocol has been reviewed and approved by an independent Ethics Committee in accordance with the guidelines laid down by the Royal College of Physicians. The volunteers come from all three Services and from both sexes. The CBDE Ethics Committee was established in July 1991. This Committee follows the guidelines laid down by the Royal College of Physicians of London and its membership includes lay members, members of both sexes from the local community, a nurse and a general medical practitioner. The Ethics Committee has subsumed previous arrangements for the ethical review of proposed volunteer studies. For some 30 years, a committee on the safety of human experiments had been set up at this establishment involving all the medical officers on the staff of the establishment whose task was to review all the protocols for proposed volunteer studies to ensure that they were as safe as possible; this committee had the right of veto. Following such reviews, protocols were then considered by an ethical sub-group of the Medical Committee of the Defence Scientific Advisory Board, which involved independent experts." {*Hansard (Lords)* written answer 7 Feb}

**7 February** In Washington the US defence budget for Fiscal Year 1995 is announced. The Administration is seeking a total of \$263.7 billion. The Defense Department later indicates that the budget includes \$851.3 million for the FY95 Chemical Stockpile Disposal Program and the FY 95 Non-Stockpile Chemical Materiel Program {Army testimony in Senate 26 Apr}, and also about \$506 million for the FY95 Chemical Biological Defense Program {Defense testimony in Senate 13 May}. The latter includes a new 'Joint Biological Defense Program' research and development programme-element, for which \$52.895 million is requested. {*Aerospace Daily Defense Budget Supplement* 23 Feb}

For the Nunn-Lugar program of assistance to the disarmament efforts of former Soviet states, \$400 million is earmarked. {*Arms Control Today* Mar}

**8 February** In Iran, during an address to air force personnel, Ayatollah Khamene'i responds as follows to foreign accusations that Iran is acquiring chemical weapons: "We shall do anything which conforms to our principles, and if we deem it necessary we shall manufacture or obtain weapons, as we did during the imposed war. But we do not seek to obtain and use banned weapons, because we respect our principles and faith." {*Voice of the Islamic Republic of Iran* 8 Feb in BBC-SWB 10 Feb}

**8 February** The US government initiates sanctions against three companies in Thailand under the 1991 Chemical and Biological Weapons Control and Warfare Elimination Act. It has determined that the three companies "have engaged in chemical weapons proliferation activities" [see also 7 Nov 93]. {*Federal Register* 7 Mar, p 10663.}

**9 February** Israel proposes to the OPCW Preparatory Commission that the inspection teams conducting challenge inspections should, in the interests of preserving confidentiality, be required to use safety equipment supplied by the inspected facility, not their own equipment. This would include personal monitors, protection clothing and masks. The use of any additional safety equipment would be subject to negotiation prior to entry into inspected sites. {PC-VI/B/WP.6}

**9 February** In Strasbourg the European Parliament unanimously votes approval for the long-projected International Science and Technology Centre in Moscow [see 27 Dec 93]. {*NRC Handelsblad* 10 Feb in FBIS-WEU 14 Feb; *Chemistry & Industry* 7 Mar} The ISTC is a joint EU-Japanese-Russian-US venture which seeks to prevent a brain-drain from Russia of nuclear and CBW weapons specialists. Up until November, Russian actions had been blocking it. {*Science* 18 Mar}

**9 February** In Washington, Senator Donald Riegle [see 9 Sep 93] announces that exports of biological agents to Iraq had been licensed by the Department of Commerce during 1985-89. The exporter had been American Type Culture Collection, a nonprofit body collecting and distributing biological samples worldwide. Its associate science director confirms that, in response to requests from Iraqi government representatives, cultures of *Bacillus anthracis* and *Clostridium botulinum* had been shipped. Senator Riegle says that ATCC had been licensed to export at least three other biological agents as well, according to Commerce Department records obtained by the Senate Banking Committee, of which he is chairman. {*New York Times* and *Washington Post* 10 Feb}

Senator Riegle makes these statements during a floor speech in the US Senate in which he suggests that the unexplained symptoms suffered by Gulf War veterans, and the apparent transmission of that illness to family members, might have been due to Iraqi biological weapons. {*Congressional Record* (daily) 9 Feb, pp S1196-1201}

**10 February** The US Defense Department, in its annual report to the President and the Congress released today, says: "Since the United States has forsworn chemical and biological weapons, the role of US nuclear forces in deterring or responding to such nonnuclear threats must be considered".

The Department's Nuclear Posture Review, due for completion in the spring, is addressing such issues. {*Defense News* 14-20 Mar}

**10 February** US Arms Control and Disarmament Agency Director John Holum testifies to the Congress on the \$61.3 million requested for ACDA in the President's budget for Fiscal Year 1995. Of it, \$14 million is needed to pay the US assessment to prepare to implement the Chemical Weapons Convention. {*USACDA For Your Information* 17 Feb}

**11 February** In Russia, a Petrozavodsk newspaper carries a participant's account of a 1961 ocean-burial operation in which thousands of tons of mustard-gas bombs and other chemical munitions were dumped in the Arctic Ocean. {*ITAR-TASS* 11 Feb in FBIS-SOV 14 Feb}

**14 February** Moscow City Court approves a petition from the prosecutor in the Mirzayanov case [see 4 Feb] that the case be referred back to the Procurator-General for further investigation. There is expectation that the charges will now be dropped. Dr Mirzayanov continues to be held in custody, but is released eight days later on the condition that he remains in Moscow. {*Izvestiya* 16 Feb in JPRS-TAC 7 Mar; *Chemical & Engineering News* 21 Feb; *Science* 25 Feb}

**14 February** The US Arms Control and Disarmament Agency's responsibilities for Biological Weapons Convention matters have now, with the move of Dr Edward Lacey to the Pacific-Sierra Research Corporation's Center for Coun-

terproliferation [see 13 Dec 93], been taken over by Donald Mahley, head of the Agency's Bureau of Multilateral Affairs. {*Arms Control Reporter* at 701.B.125}

**15 February** In The Hague, the OPCW Preparatory Commission Committee on Relations with the Host Country reconvenes [see 18 Jan] for its third session, chaired by Commission chairman Grigory Berdennikov of the Russian Federation. {PC-VI/HC/4} Among the papers before it is a detailed interim estimate from the Provisional Technical Secretariat of the costs of the OPCW Building as built to the latest Expert-Group programme of requirements. The PTS has also reported on the available options for using existing buildings, observing that, for accommodating a total OPCW staff of 575-650 people, the only serious possibility is the Aegon building, currently occupied by the UN International Tribunal for Alleged War Crimes in the former Yugoslavia. {PC-VI/HC/2} The Committee asks the PTS to develop further cost estimates, including ones on the available options for interim PTS/TS accommodation.

**15 February** Russia and the United States transmit to the OPCW Preparatory Commission the basic text of their agreed understanding on measures for the preparation and implementation of the second phase of the 1989 Wyoming agreement. The *Understanding* and its 12 annexes had been one of the official-level agreements signed during the Moscow summit [see 14 Jan].

According to this text, the exchange of detailed stockpile and facility data is to begin by 14 April and to be completed by 14 May; and each side is to conduct five inspections during the period 11 August to 10 November, beginning with a trial challenge inspection. The facility data are to include not only production facilities but also all establishments constructed or used since 1 January 1946 primarily for development of chemical weapons. The text also says: "In view of the fact that at the time of the data exchange neither of the sides has, nor is planning to have, a single small-scale facility as allowed under the Multilateral [Chemical Weapons] Convention, the sides will not include data on such facilities in the data exchange". {PC-VI/4}

**15 February** British Defence Secretary Malcolm Rifkind, during a lecture at the Centre for Defence Studies at King's College London, announces that a 2-year series of studies is being launched to determine whether Britain should develop an antiballistic missile defence network. {*Defense News* 21 Feb; *Aviation Week & Space Technology* 21 Feb}

**15 February** In the United States, at White Sands Missile Range, New Mexico, another *Storm* re-entry vehicle simulating a CW missile warhead is successfully intercepted by an ERINT hit-to-kill missile [see 30 Nov 93]. The target had carried a bulk fill of water to simulate the CW-agent fill, and most of it is vapourized during the impact.

Four days previously, the Army System Acquisition Review Council had selected the Loral Vought ERINT in preference to the Raytheon multimode seeker *Patriot*, which has a steerable blast/fragmentation warhead, as its choice for the Pac-3 missile development programme, the top priority in US theatre missile defense efforts. {*Aviation Week & Space Technology* 21 Feb; *BMD Monitor* 25 Feb} The Defense Acquisition Board is scheduled to meet on 1 March to review the Army preference for ERINT, but the meeting is postponed by Under Secretary of Defense John Deutch, pending further study. {*Jane's Defence Weekly* 12 Mar; Aaron Zitner in *Boston Globe* 23 Mar}

**16 February** In Iraq, the director of the Military Industrial Organization, Lt-Gen Eng Amir Muhammad Rashid, issues a statement suggesting that UNSCOM Executive Chairman Ekéus has become a tool of US political manoeuvres against Iraq by giving the unjustified impression that Iraq was continuing to withhold information on chemical weapons [see 2-6 Feb], as in an interview broadcast the day previously on the US television network CNN. {INA 16 Feb in BBC-SWB 18 Feb}

*ca* **16 February** Zimbabwe joins those BWC states parties that have requested the convening of a Special Conference to examine the VEREX report [see 13 Dec 93]. The requisite majority is thereby achieved.

**18 February** In Russia, people working at the State Institute for Organic Synthesis Technology (GITOS) at Shikhany [see 1 Jul 93] have not been paid for three months, such are the financial difficulties now prevailing there. GITOS was formerly engaged in chemical-weapons development, and is now examining possible chemdemil processes. According to the current draft of the Russian chemdemil plan, GITOS will be used for detoxification of the 1025 tonnes of mustard gas and lewisite held at Gornyy, 100 km away. The arsenic-extraction technology favoured by GITOS scientists for this task can also be applied to adamsite, of which more than 8000 tonnes reportedly lie buried near-by in the Shikhany test ranges. {*Izvestiya* 18 Feb in JPRS-TAC 7 Mar; Russia TV 18 Feb in BBC-SWB 21 Feb}

**20 February** In Cairo, a committee of the Arab League begins work on means for freeing the Middle East of mass-destruction weapons. The committee, which is chaired by the permanent delegate of Egypt, Dr Nu'man Jalal, is due to present a paper at the next session of the Arab League Council, scheduled for 27 March. {MENA 20 Feb in FBIS-NES 22 Feb}

**21 February** In Germany, the 'Iraqi poison-gas trial' in Darmstadt [see 31 Jan] is suspended pending an application by the defendants to the European Court in Luxembourg. {*Frankfurter Rundschau* 22 Feb}

**21 February** The UK government responds as follows to a question in parliament about British Gulf-war veterans suffering from the putative 'Gulf war syndrome' [see 21 Jan]: "[The Defence Ministry] has applied standard epidemiological and statistical criteria, universally employed by the medical profession when researching existing or possible new diseases, in judging the scientific merits of all information received relating to the alleged Desert Storm syndrome. The application of such criteria to information available to date has not identified any scientific evidence proving the existence of a new medical condition peculiar to service in the Gulf conflict." {*Hansard (Commons)* written answers 21 Feb}

Lawyers acting on behalf of some 250 British veterans who believe themselves to be suffering from the syndrome are reportedly preparing to lodge claims for £25 million in compensation. {*Sunday Times* 27 Feb}

**22 February** The OPCW Provisional Technical Secretariat announces an expanded industry outreach effort. This includes the provision of direct assistance by the PTS to individual companies or trade associations in clarifying "the implications of the CWC for the activities of the chemical industry", provided their respective governments agree. {PC-VI/5}

ca **22 February** The US Supreme Court rejects a petition to reopen the Agent Orange liability case [see 6 Jan]: it refuses, without comment, to hear arguments that many Vietnam-War veterans have been denied their right to sue the manufacturers of the agent. {*Chemical and Engineering News* 28 Feb}

**22 February** The US General Accounting Office produces a critical report on the Army's programme for helping communities near chemical stockpile sites prepare themselves for emergencies such as accidental releases of CW agent [see 16 Jul 93]. This Chemical Stockpile Emergency Preparedness Program was established in 1988. The estimated completion date is now 2003, rather than 1994 as originally specified, with a total cost to completion of \$696 million, rather than \$114 million. {GAO/NSIAD-94-91}

**23 February** Armenian armed forces have fired poisonous chemical projectiles 38 times this past year against Azerbaijani forces and noncombatants in northern Karabakh, according to a broadcast on National Television of Azerbaijan which quotes Agdam civil defense headquarters. Mustard gas and "cyanics" have reportedly been identified following "laboratory examination". {*Turan* 23 Feb in JPRS-TND 23 Mar; Azerbaijan television 24 Feb in FBIS-SOV 28 Feb}

**23 February** The UK Ministry of Defence, under contract to the US Ballistic Missile Defense Organization, is to evaluate an air-defence warhead with penetrator projectiles developed by the Ministry for application against missile-borne chemical and biological weapons. Further, the research effort, announced in *Commerce Business Daily*, will use models and facilities owned by the Ministry to assess CBW threats, compile and correlate US and UK data on the properties of CBW weapons, and further develop simulations of non-nuclear defeat mechanisms for CBW weapons and potential hardening countermeasures. {*Defense Daily* 23 Feb}

**24 February** The Netherlands provides the OPCW Preparatory Commission with a working paper detailing the planned arrangements for implementing the CWC in the Netherlands. An interministerial consultative group had been established in 1991 to develop the plans. Meeting alongside it had been separate consultative forum involving the Netherlands chemical industry. The interministerial group had first addressed the legal, practical and financial implications of the CWC; had then turned to the establishment of the Article VII National Authority; and had finally considered the requisite draft legislation and regulations. The Netherlands Minister for Economic Affairs has been designated as the National Authority. The task of processing the national declarations to the OPCW will fall to the Ministry's Central Licensing Office for Import and Export, with the Ministry's Economic Investigation Agency responsible for monitoring compliance.

The working paper summarizes the projected legislation and regulations. It also gives preliminary information on the numbers of production facilities and traders handling reportable quantities of scheduled chemicals (Schedule 2: 3 plus 10; Schedule 3: 10 plus 30). The intention is to apply national inspections to the country's chemical industry in addition to the OPCW inspections, this reflecting a policy of "active national monitoring". {PC-VI/A/WP.6}

**24 February** The US Department of Commerce announces the administration's proposed new export control legislation, in-

tended to take the place of the 1979 Export Administration Act which expires in June. Secretary Ronald H Brown says at a press briefing: "We feel it strikes the critical balance between nonproliferation concerns and economic interests". {*New York Times* 25 Feb; *Arms Control Today* Apr} The aims are to loosen export controls on some high-technology goods, increase the rights of industry to oppose controls, speed up licensing decisions, and institute modalities for resolving interdepartmental disputes. {*Defense News* 28 Feb-6 Mar}

**26 February** The Russian Armed Forces General Staff, through a press interview by its chief, Colonel General Mikhail Kolesnikov, announces solid progress in the planning for destruction of Russian chemical weapons; and, like the President's Commission on CBW Convention Problems [see 1 Feb], vehemently criticizes the domestic critics of the Russian chemdemil effort. {*Krasnaya Zvezda* 24 Feb in JPRS-TAC 7 Mar}

**28 February** UNSCOM announces that no traces of CW agent had been found in any of the samples taken during its investigation of the reports of CW attacks in the southern marshlands of Iraq at the end of September [see 20-21 Nov 93]. The samples had been analyzed in the UK and the USA, further aliquots being held in France for control purposes. Thus, says UNSCOM, "there is no evidence to support the allegations of chemical weapons use". {UN press release IK/165} The UK aliquots had been analyzed over several months at CBDE Porton Down. {UK FCO *Notes on Security and Arms Control* 1994 Feb}

A member of the Tehran-based Supreme Assembly of the Islamic Revolution in Iraq says later that the reason for this failure to discover proof of Iraq's use of chemical weapons was the 40-day delay in the dispatch of the UN fact-finding team: "The Ba'thist regime had cleaned up the area and removed all traces of chemical agents". Also, the team had not known the area well enough to go to the right place. {IRNA 17 Mar in BBC-SWB 19 Mar}

**28 February** In the United States, the Committee to Review the Health Consequences of Service during the Persian Gulf War holds its first public hearing. The Committee, convened in January by the Departments of Defense and Veterans Affairs [see also 1 and 9 Nov 93 and 21 Jan], comprises 18 scientists chaired by John Bailar III of McGill University. An interim report is expected from it in about a year's time. {AP in *Washington Post* 2 Mar}

**28 February-4 March** In Geneva there is an organizational session of the Group of Governmental Experts convened by the UN Secretary-General to prepare for the first review conference of the 1980 Inhumane Weapons Convention. {*Disarmament Newsletter* Jan-Feb} The Group is chaired by Johan Molander of Sweden. **CHECK**

**1 March** In the eastern Mediterranean, the seventh trial launch of the joint Israeli-US *Arrow* antimissile missile system [see 14 Oct 93], in which the target (another *Arrow* missile) has a simulated CW warhead, is not successful: a malfunction prevented firing of the interceptor missile. {Israel Television 1 Mar in FBIS-NES 3 Mar; *Aerospace Daily* 2 Mar}

**1 March** The US Marine Corps awards a \$43 million contract for the supply of a further 252,800 Saratoga CW protective



suits in addition to the 286,923 already received since 1990 as replacement for the Battle Dress Overgarment. An \$18 million contract for 100,000 more suits is to be issued next month. {*Jane's Defence Weekly* 26 Mar}

**1 March** In the United States, the state of California legalizes sales of one particular type of oleoresin capsicum self-protection "pepper spray". The authorized spray is manufactured by Defense Technology Corporation of America. {*Los Angeles Times* 8 Feb}

**1 March** Russian officials in the United States complete a tour of inspections at three non-military biological research and production sites. The Russian team had arrived in Washington on 11 February. The sites, chosen at short notice by the Russian team, have been a facility at Vigo, Indiana, currently owned by Pfizer Inc; another Pfizer facility, at Groton, Connecticut; and Plum Island Animal Disease Center [see 16 Jul 92], currently a Department of Agriculture facility. The visits have been the first Russian ones to be conducted within the framework of the September 1992 trilateral Russo-UK-US *Joint Statement on Biological Weapons* [see 10-11 Sep 92]. {*New York Times* 2 Mar; *Arms Control Reporter* at 701.B.123-5} There have previously been Anglo-American visits to non-military biological sites in Russia [see 9 Oct 93]; to four such sites, according to Russian sources {ITAR-TASS 29 Mar in FBIS-SOV 30 Mar; Radio Moscow 12 Apr in FBIS-SOV 14 Apr} during 1992, October 1993 and January 1994; or, according to the British government {*Hansard (Commons)* written answers 12 Apr}, to five such sites, during November 1992, September 1993 and January 1994.

**1-2 March** In the United States at Aberdeen Proving Ground, the American Defense Preparedness Association organizes an advance planning briefing for industry on NBC defence and chemdemil: company marketing and technical representatives are informed about acquisition requirements and specific contracting opportunities in these fields over the next five years. {*National Defense* Feb}

**3 March** In Germany the Chancellor's intelligence coördinator, Dr Bernd Schmidbauer, issues a statement referring to a new Libyan chemical-weapons facility under construction at Tarhuna [see 7 Nov 93], saying that German equipment appeared to have been used in the construction work. But the statement also says that there was not "a single piece of evidence that German companies were involved in the construction of the complex", and notes that, in Summer 1992, the Federal government had warned German companies against participation in the project. The statement is a response to allegations made the day previously in the ZDF television programme *Kennzeichen D*. The programme had also discussed the possibility of the new Libyan construction being intended for biological weapons. A criminal investigation of suspected German companies is underway in Frankfurt. {ZDF Television 2 Mar in FBIS-WEU 4 Mar; *Süddeutsche Zeitung* 5 Mar; *Times* (London) 5 Mar}

**3 March** In Santiago, the Chilean Foreign Ministry publishes the papers produced at the regional CWC seminar 6 months previously [see 9-10 Sep 93]. The publication notes that countries such as Argentina, Chile, Cuba, Mexico and Venezuela are concerned with preventing impediments to economic and technological development in the area, and with establishing

solid foundations for trade in chemicals unsuited to military use. {EFE 3 Mar in BBC-SWB 7 Mar}

**3-14 March** In North Korea the IAEA conducts inspections at declared nuclear facilities as agreed on 15 February, but at one facility it is not permitted to conduct a full inspection. The Director-General subsequently states that the inspections had not permitted the IAEA to conclude that nuclear material had not been diverted for military use in North Korea since February 1993. {*Hansard (Commons)* written answers 29 Mar}

**5 March** In Russia a deputy chief of the Radiation, Chemical and Biological Protection Troops, Colonel Viktor Kholstov, says in interview that Russia has "completed work on elaborating the concept of destruction of toxic chemical agents" and that elimination of the country's chemical weapons will start after the Duma has ratified the CWC. Asked whether new types of chemical weapons were being developed, Colonel Kholstov replies: "Russia is not violating international agreements, but the strengthening of national security lies within its scope just as it does in any sovereign, self-respecting state". {ITAR-TASS 5 Mar in FBIS-SOV 7 Mar}

**5 March** The UK Department of the Environment gives notice that a field experiment of a biological control agent, is to be conducted near Oxford. A team from the National Environment Research Council Institute of Virology will be spraying a virus genetically modified to carry a scorpion-toxin gene over young cabbages infested with caterpillar pests. {*Oxford Mail* 5 Mar quoted in *Genetics Forum* Jun; *Independent* (London) 18 and 26 May}

**6 March** In Kuwait, the Ministers of Defence and Health say that the country, in the aftermath of the Gulf War, is free of any abnormal diseases, despite press reports about 'Gulf War syndrome' [see 9 Feb]. {*Al-Watan* 7 Mar in FBIS-NES 15 Mar}

**7 March** In Tokyo, the Japanese government begins a week-long seminar for senior officials from 12 republics of the former Soviet Union on how to establish an effective export control system directed at illicit traffic in weapons and technologies. {*Defense News* 28 Feb}

**7 March** The US Army announces that it has chosen reverse-assembly as the preferred alternative for the pre-incineration stage of chemdemil operations at Pueblo Depot Activity, Colorado. Cryofracture has been rejected because of "immaturity of the process". {*Inside the Army* 14 Mar}

**8 March** In Washington, Representatives Martin Lancaster and Glenn Browder host the first of what is to be a series of luncheon seminars for members of Congress and their staffs sponsored by the CWC Implementation Project of the Henry L Stimson Center. The head of Industry Operations in the Verification Division of the OPCW Provisional Technical Secretariat, Don Clagett, gives a presentation on the work of the PTS in ensuring that the OPCW will be fully capable of discharging its verification duties if the CWC enters into force as early as January 1995. {*Chemical & Engineering News* 21 Mar}

**8 March** In the US Senate, the Administration's proposed new export control legislation [see 24 Feb] is introduced by Senator Riegle [see 9 Feb]. The bill, S2478, would liberalize export controls by requiring licence applications to be reviewed

within 90 rather than 120 days, by strengthening the role of the Department of Commerce in the review process, and by restricting the government's ability to impose unilateral export controls. However, while relaxing the licensing procedures for transfers of conventional or dual-use technologies, the bill would also seek rigidly to restrict transfers of technology that could be used to produce or deliver weapons of mass destruction. {*Defense News* 21-27 Mar; *Arms Control Today* Apr}

**10 March** In Thailand, US Ambassador David Lambertson issues a statement noting that there had been no new developments following the US warning six months previously about three Thai companies supplying workers for chemical-weapons-plant work in Libya [see 18 Sep 93]. Accordingly, the companies were now barred from doing business with US companies [see 8 Feb]. The owner of one of the Thai companies has denied the charges, but has admitted designing and overseeing the construction of a "safety bunker" in a Libyan complex believed by the United States to be a chemical-weapons factory. {*Siam Post* 11 Mar in JPRS-TND 23 Mar}

**10 March** In Moscow, Aleksey Yablokov, now chairman of the Interdepartmental Commission for Ecological Safety of the Russian Security Council, speaks at a press conference about the "very conservative" nature of official data on chemical weapons in Russia. He says that the holdings are not 40,000 tonnes of toxic substances, as officially stated, but possibly a whole order of magnitude more. {*Radio Rossii* 10 Mar in JPRS-TND 23 Mar; *Segodnya* 11 Mar in JPRS-TND 23 Mar}

A week later, Commission consultant Valery Menshikov states that an unknown quantity of chemical weapons had been destroyed during the summer and autumn of 1993 in order to reduce total holdings to 40,000 agent tonnes. {*Interfax* 17 Mar quoted in *RFE/RL News Briefs*, 21-25 Mar; *Daily Telegraph* (London) 18 Mar}

**11 March** In Russia, the office of the Procurator-General announces that the criminal case against Dr Vil Mirzayanov [see 14 Feb] has now been dropped "for lack of evidence of a crime" and "absence...of any violations of both law and the constitution". {*Novosti* newscast 11 Mar in FBIS-SOV 11 Mar; *Chemical & Engineering News* 21 Mar} Dr Mirzayanov says that he will be "taking the 'new KGB' to court for the great moral and material damage they caused me these past 18 months". {*Times* (London) 17 Mar}

**11 March** In Moscow, at a press conference, Dr Lev Fedorov [see 1 Feb] launches his new study *Chemical Weapons in Russia: History, Ecology, Politics*. {*TAR-TASS* 11 Mar in BBC-SWB 14 Mar}

**14 March** US Army Edgewood Research, Development and Engineering Center is proposing a Chemical Satellite programme as contribution to the Defense Department counterproliferation effort. Edgewood research manager Bill Loerop is quoted as saying that the programme is intended to develop a satellite capable of detecting clouds of chemicals as small as 50 metres across. {*Defense News* 14-20 Mar}

**14-19 March** In New York there is a new round of high-level talks [see 2-5 Feb] between the government of Iraq, on the one hand, and UNSCOM and the IAEA, on the other. The talks, which proceed in both plenary and technical-level sessions, are mainly about the plan approved by Security Council resolution

715 (1991) for ongoing monitoring and verification in Iraq to ascertain that the weapons programmes prohibited and destroyed under SCR 687 (1991) are not reactivated; a necessary precondition for lifting of the UN embargo is that this OMV regime is in place. The approved plan [see 2 Oct 91] depends on Iraq supplying verifiable baseline information in adequate quantity and detail; what exactly was still needed is the main focus of the talks. UNSCOM is now recruiting additional personnel to handle OMV work.

The Iraqi side presents additional information about its past chemical weapons programmes [see 16 Feb]. According to the subsequent UNSCOM report on the talks, {UN doc S/1994/341} this "included data on the importation of precursor chemicals and a time correlation between declared production quantities of chemical warfare agents, imported precursor chemicals and installed production capacity". Also presented by Iraq, in lieu of absent historical documentation, are data from interviews with "senior Iraqi personnel associated with the past chemical weapons programme, among them the former head of Al Muthanna for the period from 1981 to 1987". The report states that all this new information has yet to be evaluated by UNSCOM.

On the biological side, in contrast to the chemical, UNSCOM has specified a time — the second week of April — for initiating its baseline OMV inspections. Start-up of the chemical OMV inspections, possibly in May, is "very much dependent" on Iraq completing its initial data declarations. Chemical sensors are currently being installed on a trial basis, and thought is being given to biological technical monitoring as well. Thus, the UNSCOM report on the talks says: "[I]n May, it is intended to hold a series of seminars between Commission personnel and international experts on biological issues. There will be seminars on reviewing the information obtained from the baseline inspections to assess where monitoring and verification effort should be focused in the biological area; sensor technologies that might be of use at biological sites; and a full review of Iraq's past and current biological activities in order to assess whether the Commission has indeed accounted for all the materials and equipment of concern and ensure that these will be adequately monitored... On the basis of these seminars, a further round of inspections will be conducted at sites identified as key in the biological area."

**15 March** The US General Accounting Office reports to the Chairman of the Senate Foreign Relations Committee, as requested, on progress thus far in implementing the 1989 and 1990 bilateral CW agreements with Russia (as successor to the Soviet Union), on the status of the Chemical Weapons Convention, and on the costs to the United States of these agreements.

The report outlines the final implementation plan for Phase II of the 1989 Wyoming Memorandum of Understanding, as signed by the two sides during the recent Moscow summit [see 15 Feb]. The report states that "many countries" are delaying ratification of the CWC until Russia and the USA have done so, and that, for this reason, the CWC is unlikely to enter into force as early as it could, namely by 13 January 1995.

As to costs, the USA has spent some \$166 million on the bilateral and multilateral CW agreements since 1988 and has projected expenditure of another \$717 million during FY 1994-99. Research and development of verification technology — by the Defense Nuclear Agency, the Department of Energy, and ACDA — accounts for \$98.7 million and \$85 million, respectively, of those two totals. The GAO suggests that at least

some of the R & D costs are recoverable from the OPCW or its Preparatory Commission.

The report also states that, in Congressional testimony earlier in the month, the US Defense Department had said that, in order to spur the Russian chemdemil programme, the United States is prepared to provide \$300 million or more to help build a pilot chemdemil facility in Russia, provided Russia agrees to destroy its most modern CW bombs at the plant. Such a plant would take 8 years or more to build. {GAO/NSIAD-94-136}

**17 March** In the Czech Republic, the Prague newspaper *Cesky Denik* reports that the former Czechoslovak Socialist Republic had conducted a BW-weapons programme at a secret Military Research Institute near Techonin in the Orlicke Hory mountains of eastern Bohemia. Cholera, plague, smallpox, tularaemia, meningitis and psittacosis are said to have been among the diseases studied for weaponization. {ASA Newsletter 7 Apr} A former director of the institute (which is now the J E Purkyne Military Medical Academy Institute of Immunology and Microbiology), Petr Propper, states that no development of biological weapons had ever taken place there, the institute being concerned "exclusively with defense-related research". He describes as false the *Cesky Denik* report that dangerous strains of bacteria and viruses developed at the institute are stored in other parts of the Czech Republic. {*Mlada Fronta Dnes* 18 Mar in JPRS-TND 1 Apr} This story is also denied by Defence Minister Antonin Baudys. The chairman of the Parliamentary Foreign Affairs Committee, Jiri Payne, calls for thorough investigation of the affair. {*Cesky Denik* 19 and 21 Mar in JPRS-TND 1 Apr} The chairman of the Defence and Security Committee, Vladimir Suman, calls for a full report from the Defence Minister. {ASA Newsletter 7 Apr}

Later, responding to reports that BW weapons based on smallpox were held in the Czech Republic, Defence Minister Baudys says that a small quantity of variola minor virus had been stored. {CTK 23 Apr in BBC-SWB 26 Apr}

**17 March** In the UK, the Director-General of the Porton Down Chemical and Biological Defence Establishment, Dr Graham Pearson, includes the following in a further answer to a Parliamentary question answered in January: "When a parliamentary question concerning work on a particular subject is asked, information is sought from all readily available sources which include the library at CBDE to see if there are any reports on the subject, and the Superintendents of the Divisions at CBDE in which such work is being or may have been carried out, who in turn make enquiries of their senior staff. If these searches reveal no information I then reply stating that our records do not indicate any work into this subject. It would require a disproportionate amount of effort and cost, every time a Parliamentary Question is asked, to initiate a search into the past records at the Public Record Office or elsewhere to see if there was information on a particular subject." {*Hansard (Commons)* written answers 17 Mar}

This further answer had been necessitated by the discovery in the Public Record Office of a paper from the early 1960s apparently contradicting the answer which Dr Pearson had given to a question about research work at Porton in progress then.

**17-18 March** In Moscow the International Science and Technology Centre [see 9 Feb] begins operations with a meeting of its governing body. The ISTC has an overall budget of \$65 million for its first two years. The Governors approve 23 of the 75 projects thus far screened from the 180-odd submitted, in-

volving an initial funding of \$11.9 million. The projects will engage more than 600 Russian scientists and engineers, as well as hundreds of supporting staff. {*Atlantic News* 23 Mar; *Defense News* 28 Mar-3 Apr; *Arms Control Today* May}

**18 March** In Belgium, new export control regulations enter into force as agreed within the Australia Group. They extend existing regulations to cover installations, equipments and technologies applicable in the production of CW agents and their precursors; biological equipment applicable in the production of BW agents; and biological agents. {*Belgisch Staatsblad* 18 Mar, pp 6716-22}

**18 March** In the United States, new export control regulations enter into force reflecting revisions in control lists agreed at the June 1993 meeting of the Australia Group. {*Federal Register* 18 Mar, pp 12824-8}

**18 March** The US General Accounting Office reports on the development status of chemdemil technologies alternative to incineration. It concludes that none of the eight alternative technologies considered is likely to reach maturity in time to destroy the US chemical-weapons stockpile to the deadline required by existing legislation, namely 31 December 2004. At least three further years would be required, probably more, by which time the 10-year deadline set by the CWC is likely to have been exceeded as well. {GAO/NSIAD-94-123}

**18-21 March** In Washington the Chemical Weapons Working Group holds its third annual conference focused on the US chemdemil programme. The participation includes delegates from each of the stockpile sites plus Hawaii and Russia, and representatives of Greenpeace, the Military Toxics Project, Physicians for Social Responsibility, and the Government Accountability Project. The coalition which the CWWG represents has developed a 7-page position paper, *The Citizens' Solution for Chemical Weapons Disposal*. It advocates agent neutralization instead of incineration. {*Common Sense* Apr special edition}

**19 March** In Kazakhstan, officials present to US Defense Secretary William Perry a list of about half of the country's defence plants, the plants listed being ones proposed for conversion to civil purposes with US assistance. Secretary Perry is touring the four nuclear-armed republics of the former Soviet Union, seeking to spur demilitarization. Included on the Kazakhstan conversion list is a plant in the city of Aksu which, according to Western sources, had been designed to produce biological-weapons materials. {*Reuter* 19 Mar; *Washington Post* 20 Mar}

**19 March** The UN Security Council, after conducting its bi-monthly review of sanctions against Iraq, decides against lifting the sanctions but is unable to agree upon a statement to accompany the decision. France, supported by Russia, China and Brazil, had wanted to commend Iraq for its increased coöperation with UNSCOM [see 14-19 Mar], but Britain and the United States had opposed this, saying that Iraq was still far short of full compliance with the Gulf-War ceasefire terms. {*Guardian* (London) 16 Mar; *Financial Times* (London) 19-20 Mar; AFP 20 Mar in JPRS-TND 1 Apr} With the backing of some Council members, UNSCOM Chairman Rolf Ekéus has reportedly been proposing a test-period of 6-12 months after which, if Iraq is judged to have been complying properly with

UNSCOM's ongoing monitoring and verification regime, the sanctions would be lifted. {*Guardian* (London) 17 Mar}

**20–26 March** In Iraq, the fourteenth UN chemical inspection team, UNSCOM 70, led by Gerald Brubaker of the United States and numbering six people, installs four air-samplers at the former chemical-weapons complex at al-Muthanna for trial use in the ongoing monitoring and verification effort [see 14-19 Mar]. {UN doc S/1994/489}

**21 March** In Washington, the Chemical Weapons Working Group presents its position paper on chemdemil [see 18-21 Mar] at a Capitol Hill news conference. {*Sun* (Baltimore) 22 Mar; *Chemical & Engineering News* 28 Mar}

**21 March** President Clinton orders a US Army *Patriot* missile battalion to South Korea [see also 3-14 Mar] by ship. {*Washington Post* 22 Mar; *Aviation Week & Space Technology* 28 Mar}

**22 March** In Seoul, North Korean defector Li Chung-kuk, said to have been an Army sergeant assigned to a laboratory of the North Korean Defence Ministry nuclear-chemical defence bureau, speaks as follows at a press conference: "North Korea can kill and hurt the entire South Korean people with its chemical and biological weapons. They boast that they have the most lethal chemical weapons in the world." Sergeant Li is said to have fled into China on 9 November, arriving in Seoul on 18 March. {UPI 22 Mar; *International Herald Tribune* 23 Mar}

A month previously a report by the South Korean National Unification Board had been released which stated that North Korea had a thousand tons of CBW weapons in storage [see also 27 Sep 93]. This government report also stated that North Korea operated eight plants producing chemical weapons and three laboratories devoted to biological warfare. {*International Herald Tribune* 23 Feb}

**22 March** In Cambodia, during fighting in the Thai border region near Pailin, chemical weapons are used against Khmer Rouge fighters by the Khmer Royal Armed Forces, according to a report in the *Bangkok Post*. The report is denied by a KRAF spokesman in Phnom Penh, who says that the Cambodian government has never purchased or been supplied with chemical weapons. The spokesman also says that more than 10 KRAF combatants have died after drinking water from streams and ponds poisoned by the Khmer Rouge. {Channel 9 Thai Television 22 Mar, and National Voice of Cambodia 23 Mar in BBC-SWB 24 Mar}

**22 March** In Bosnia-Herzegovina, Serbian forces use chemical agents in the Bihac region, according to Sarajevo radio. {Radio Bosnia-Herzegovina 22 Mar in JPRS-TND 1 Apr}

**22 March** US Defense Department Tactical Warfare Programs Director Frank Kendall says in interview that he had been directed earlier in the year by Under Secretary of Defense John Deutch to devise a plan for acquiring "nonlethal" technologies [see 24-28 Jan] and systems. He says: "We're not looking at this as a new warfighting strategy per se, but rather as another effective tool for the users... Our challenge is figuring out how to incorporate nonlethality in existing operational concepts". As part of this work, Dr Kendall is conducting a survey of the many different nonlethality programmes being pursued in the services, the Advanced Research Projects Agency and Department of Energy laboratories. Projects for chemical im-

mobilizers, neural inhibitors and a variety of different anti-materiel chemical/biological weapons are included in the survey. One outcome may be a major funding initiative in the FY96 budget. {*Defense News* 28 Mar–3 Apr; *Jane's Defence Weekly* 30 Apr; *Inside the Air Force* 15 Apr}

**22 March** In the US House of Representatives, the Armed Services Subcommittee on Defense Science and Technology hears testimony from Defense and Justice Department officials on plans for transferring state-of-the-art military technology, including "nonlethal" weapons, to civilian law-enforcement agencies. An agreement between the two departments is in the "late stages" of drafting. {*Defense Daily* and *Washington Post* 23 Mar}

**22 March** In the US Senate, the Foreign Relations Committee opens its ratification hearings on the Chemical Weapons Convention. There is strong testimony in support of the treaty by Secretary of State Warren Christopher and by ACDA Director John Holum. {*Congressional Quarterly Weekly Report* 26 Mar}

**24 March** In the Russian State Duma, the Committee on International Affairs opens its hearings on the Chemical Weapons Convention. The head of the Foreign Ministry arms control department, Oleg Sokolov, states that Russia's interests require it to become one of the first 65 signatories to ratify the Convention, and that the "negative implications from Russia's failure to do so are obvious". Deputy head of the Radiation, Chemical and Biological Protection Troops, Major General Yuriy Tarasevich, speaking of the need for special financing for destruction of the country's chemical weapons, says that the planned first-phase chemdemil operations at Kambarka and Gornyy would consume 500 billion 1993 roubles (about US \$250 million), which would represent 20 percent of the total costs to completion of the programme. He says that the weapons could remain safely in storage for a long while yet, but adds: "It would be wrong to shift the difficult job of destroying them to the next generation. There is every opportunity to do it now, relying on international agreements." A draft destruction plan for the weapons will be presented to the State Duma in mid April.

Also speaking at the hearing is Dr Vil Mirzayanov [see 11 Mar], who dwells on the discrepancy between the declared size of the chemical-weapons stocks awaiting destruction (40,000 agent tons) and the quantity actually produced, which he says was more than 400,000 tons [see also 10 Mar]. He calls for an international commission of experts to inquire into past disposal activities. As for future chemdemil activities, he calls for "extending the destruction period from 25 to 30 years given the enormous spending involved". {Moscow world service 24 Mar in BBC-SWB 30 Mar; ITAR-TASS 24 Mar in JPRS-TND 1 Apr; Interfax 24 Mar in FBIS-SOV 25 Mar; *Vesti* newscast 24 Mar in JPRS-TND 1 Apr; *Krasnaya Zvezda* 25 Mar in JPRS-TND 1 Apr}

**24 March** The Netherlands Foreign Ministry announces that a training course for future personnel of Article VII National Authorities of CWC states parties is to be offered by the Netherlands free of charge to 80 participants drawn from developing countries. Candidatures are to be submitted by 20 May. The course will be held during 25 July to 20 August at the Royal Netherlands Defence College. {PC-VI/B/WP.18}

**25 March** US Defense Secretary William Perry denies a newspaper report that, in the Nuclear Posture Review [see 10 Feb], he has overturned a decision by his predecessor in office, Les Aspin, and established a new role for nuclear weapons, namely deterring and responding to chemical and biological threats. He says that the review is still in its early days, and that he has neither been briefed on interim progress nor drawn any policy conclusions. {Letter to the editor *New York Times* 31 Mar}

**25 March** The new US Joint Program Office for Biological Defense [see 24 Oct 93], which is to be responsible to the Joint Chiefs of Staff and managed by the US Army, will coordinate plans to spend about \$1400 million on passive BW defences through to the end of the decade [see also 7 Feb], so a Defense Department official says in interview. The programme is said to include a stand-by vaccine production facility; mobile medical laboratories for rapid identification of BW attacks; development of helicopter-mounted laser devices for detection of BW agent clouds; and plans for immunizing rapid-reaction troops against a variety of BW agents. The Program Office is headed by Brigadier Ralph Wooten. {*Defense News* 28 Mar–3 Apr}

**25 March** UNSCOM announces that, with the burning of the last of some 400 kilolitres of mustard gas at al-Muthanna, all of Iraq's declared and recovered stockpile of CW agents has now been destroyed. Remaining for destruction at al-Muthanna are some precursor chemicals (more than 2000 tonnes of which have already been destroyed) and possibly some buried 155mm mustard-filled artillery projectiles that have yet to be recovered. {UN press release IK/[1]67}

**27 March** The Russian Defence Ministry is continuing to develop biological weapons despite a Presidential edict forbidding any such work, according to an excerpt in the London *Sunday Times* from a forthcoming book by one of its reporters {James Adams, *The New Spies*, London: Hutchinson}. The article recounts the defection to Britain in October 1989 of Vladimir Pasechnik [see 21 Jan 93], director of an institute in Leningrad [see 18-21 Nov 92] linked to several others throughout the Soviet Union in the Biopreparat network [see 19 Sep 92], a programme — “one of the best kept secrets of the cold war” — that provided cover for secret BW-related activities. Reference is made in the article to two other defectors from Biopreparat, one to the United States in late 1992, the second to the UK in autumn 1993. The article speaks of the “breakthrough” development of a new strain of the tularemia bacterium at the Obolensk Research Institute of Applied Microbiology in 1983, and of subsequent work there on plague. Apparently, Pasechnik had had the task in Leningrad of developing production processes for these agents; and “by 1987 the Soviet Union had sufficient industrial capacity to manufacture 200 kilos of the super-plagues every week”. Later, even as British and US inspectors were being privately admitted into the Obolensk and other Biopreparat facilities [see 4 Jul 92] amidst official Soviet assurances that the work there was legitimate, “a secret new facility was being built at Lakhta near St Petersburg”. This is the nub of the *Sunday Times* disclosure; it continues: “Far from the Biopreparat biological warfare programme being shut down, it had undergone considerable modernisation. Work is continuing as before, in defiance of Yeltsin's orders.”

Commenting on the article, Lt-Gen V I Yevstigneyev, deputy chief of the Russian Defence Ministry Radiation, Chemical and Biological Protection Forces, states that “any suspicions

concerning violations by Russia of the ban on the development, production or storage of biological weapons are completely unfounded”. He observes also that the article had been published during the run-up to the meeting of the Preparatory Committee for the Special Conference of states parties to the Biological Weapons Convention at which measures to verify compliance with the Convention would be addressed, measures for which Russia, in contrast to others, had been and still was a strong advocate. {Interfax 29 Mar in FBIS-SOV 30 Mar; *Krasnaya Zvezda* 30 Mar in FBIS-SOV 30 Mar}

Later, *Izvestiya* reports an unidentified Russian intelligence official as saying that the United States maintains advanced facilities for BW production, citing the equipment seen during the recent Russian inspection of Pfizer facilities [see 1 Mar]. Further, the official had suggested that the accusations of Russia were motivated by a US desire to resist Russian calls for tighter BWC compliance. {*RFE/RL News Briefs* 5-8 Apr}

**28–30 March** COCOM member states meeting in The Hague decide to end their 47-year-old multilateral export-control regime at once, even though they have not yet succeeded in agreeing a replacement [see 16 Nov 93]. They decide to continue talks on a successor regime, aiming for agreement by the end of the year. They agree, also, to uphold the existing regime's strictures on exports of weapons and military technology identified in the COCOM Munitions List. {*Financial Times* (London) 31 Mar; *Defense News* 4-10 Apr} CBW-related items figure in the Munitions List.

**29 March** In the UK, the government announces that a new Microbiological Research Authority is to be set up to run the Centre for Applied Microbiology and Research, Porton Down [see 16 Jun 93], which, from 1 April, will become independent of the Public Health Laboratory Service. Dr J Melling is appointed chief executive and director of CAMR. {*Hansard (Commons)* written answers 29 Mar}

**29 March** OPCW Preparatory Commission member states are once again asked to tell the PTS, for the latter's planning purposes, how many facilities, sites and locations they have that will become subject to declaration and inspection under the CWC. The Convention specifies 20 different categories. A standardized form is provided for replies, longer than the one sent out originally [see 15 Jun 93]. There had been 27 responses then, but of a preliminary character only in many cases. {PC-VI/12}

**29 March** In Washington, as part of the post-cold-war reorganization of the Bureau of Export Administration, a new office dealing with chemical and biological weapons will take its place alongside other new offices dealing with nuclear/missile proliferation and with the COCOM-successor regime [see 28-30 Mar]. Speaking at a conference sponsored by the US Department of Commerce, the Deputy Assistant Secretary responsible for export administration, Iain Baird, says that each new office will be charged with performing the complete range of functions associated with export controls, from policy planning to export licensing. {*BNA Washington Insider* 30 Mar}

**30 March** North Yemen has imported chemical weapons from East-European states according to sources in Aden quoted by Radio Monte Carlo, which also quotes Defence Ministry sources in Sana'a categorically denying the report. {Radio Monte Carlo 30 Mar in BBC-SWB 31 Mar}

**30 March** President Zhelev of Bulgaria, at the start of a two-day visit to London, accuses Russia of renegeing on a promise to release KGB files relating to the murder in London, by poison umbrella in 1978, of Bulgarian dissident Georgi Markov [see 30-31 Oct 93]. {*Times* (London) 31 Mar}

**31 March** In Geneva at the Conference on Disarmament, the Group of 21 neutral and non-aligned states put forward — expressly in the context of the 1995 NPT Conference — a *Declaration on the Question of Negative Security Assurances*. This proposes the negotiation of a binding multilateral convention whereby the nuclear-weapon states engage never to use, or threaten to use, nuclear weapons against non-nuclear-weapon states that have engaged themselves not to acquire nuclear weapons [see also 16 Nov 93 and 25 Mar]. {CD/1256}

**31 March** The UK government, responding to a Parliamentary question about the use of gas weapons by the police, says: “The only chemical agent which police forces are currently permitted to use is CS irritant... Police forces are permitted to use CS in extreme public order incidents where the chief officer of police judges such action to be necessary because of risk of loss of life or serious injury or widespread destruction of property; or against armed besieged criminals or violently insane persons where a senior officer judges that not to use it would endanger lives. There are no current proposals to change arrangements relating to CS.”

The government also says, however, that the “Association of Chief Police Officers is considering the possible use of products containing the incapacitating inflammatory agent, oleoresin capsicum [see 1 Mar]”. {*Hansard (Commons)* written answers 31 Mar}

**31 March** In Washington a conference on ‘The Chemical Weapons Convention: Anticipating US Ratification and 1995 Entry-into-Force’ is convened by the Center for Strategic & International Studies in co-sponsorship with the Chemical and Biological Arms Control Institute, the Chemical Manufacturers Association, the Harvard Sussex Program, and the Henry L Stimson Center, with the support also of the US Institute of Peace. Some 200 government officials, policy analysts and chemical-industry people participate. The keynote address is a powerful endorsement of the Convention given by ACDA Director John Holum. {*Chemical & Engineering News* 18 Apr} This and the other conference presentations have since been published {see *Recent Publications*, the entry for Brad Roberts}.

**7 April** President Yeltsin dismisses Academician Anatoliy Kuntsevich from his position as chairman of the President’s Committee on CBW Convention Problems. The presidential press service at first gives as the reason “numerous and rude violations of labour duties”, but later “a single gross violation of duties”. {ITAR-TASS 7 and 8 Apr in FBIS-SOV 7 and 8 Apr} No successor is named.

**7 April** Norway deposits its instrument of ratification of the Chemical Weapons Convention with the UN Secretary-General, becoming the fifth of the 157 signatory states to do so. {OPCW/PTS press release no 12}

**7 April** US Assistant Defense Secretary Ashton Carter tells reporters at a breakfast meeting that, if Russian officials agree, money appropriated by Congress under the Nunn-Lugar package of Russian aid could be used to “destroy facilities built spe-

cifically for a biological warfare program”, such as factories for the large-scale production of toxins or specialized chambers for studying the dispersal of disease agents by munitions [see also 19 Mar].

According to next day’s *Washington Post*, the administration is convinced that Russian scientists have not entirely shut down work on biological weapons, despite repeated assurances by President Yeltsin that the programme had been stopped. One reason for this belief is that recent UK/US inspections of nonmilitary biological facilities in Russia [see 1 Mar] have, according to an unidentified US official quoted by the *Post*, demonstrated that a “substantial infrastructure with no commercial purpose” and with links to the Russian military remains largely intact. Another reason for the belief, says the *Post*, is the testimony of a senior scientist in the Russian programme who defected to the United States in 1993 [see also 27 Mar]. {*Washington Post* 8 Apr}

State Department spokesman Michael McCurry, responding to a question about the *Post* article, says that the administration “has a great deal of confidence in President Yeltsin’s personal commitment to end the program”. {*Arms Control Today* May}

**8 April** Russian Foreign Minister Kozyrev says in a message to the OPCW Preparatory Commission: “The understanding that there is no alternative to chemical disarmament is deeply rooted in Russian society. Ensuring the earliest possible entry into force of the Convention remains an unchanging priority of Russian foreign policy. The Committees of the Russian State Duma have already started preparations for the ratification of the Convention [see 24 Mar]. Russian Ministries and Agencies are now completing the development of the concept for chemical weapons destruction, the adoption of which will be of the utmost importance for the ratification of the Convention by Russia. Of course a number of practical problems remain to be resolved, including the conversion of former chemical weapons production facilities and ensuring the maximum effectiveness of the resources allocated to chemical disarmament.” {PC-VI/15}

**8 April** The US National Research Council Committee on Review and Evaluation of the Army Chemical Stockpile Disposal Program issues a report advising the Army to improve its system for monitoring gaseous emissions from chemdemil facilities before operations commence in the continental United States. Although the monitoring system in use on Johnston Atoll has adequate agent-detection sensitivity, it has an excessively high false-alarm rate. {*Inside the Pentagon* 14 Apr; *Chemical & Engineering News* 18 Apr}

**8–26 April** In Iraq, the fourth UN biological inspection team, UNSCOM 72, led by Volker Beck of Germany and numbering 21 people, conducts the first biological inspections in the baseline process of the ongoing monitoring and verification plan [see 14-19 Mar]. The team visits 30 sites. The main purpose is to verify the declarations submitted by Iraq in January in accordance with the OMV plan. Other objectives are to provide an assessment of the work being undertaken and of the equipment present at the declared biological facilities, many of which have never been visited by UNSCOM; to establish an inventory of that equipment for future tagging; and to draft a format for Iraq’s regular reports under the OMV plan. {AFP 17 Apr; Reuters 20 Apr; UN doc S/1994/489}

**9 April** In Bosnia-Herzegovina, Serbian forces kill “many people” in the course of three chemical attacks on Gorazde, according to a Bosnian presidency spokesman. {AFP 10 Apr in FBIS-EEU 11 Apr}

General Rasim Delic, commander-in-chief of the Bosnia-Herzegovina Army says at a press conference: “Chemical weapons have been used several times during the aggressor’s offensive on Gorazde. I am speaking about the use of chemical gases fired from artillery weapons. These are mainly gases which cause short-term effects, gases such as irritants. The valley of the River Drina has just the right configuration of the terrain for the use of chemical gases. I would like to remind you that international conventions ban the use of chemical gases. Chemical gases have been used indiscriminately, both against the units of Bosnia-Herzegovina Army and against populated areas, in particular the village of Vitkovici. Yesterday alone 45 projectiles containing chemical gases were used. We have heard reports that they were used this morning as well. According to some unconfirmed reports chemical gases which cause long-term effects have also been used, such as blister-causing gases. We do not know the number of casualties, either among the civilians or among the soldiers, since this number is large. All indications are that the aggressor has used all prohibited means at his disposal in order to destroy people in the area.” {Radio Bosnia-Herzegovina 10 Apr in BBC-SWB 12 Apr}

This charge, amplified by the presidency and widely quoted (especially in Turkey {TRT 10 Apr in BBC-SWB 12 Apr}), is denied next day by a representative of UNPROFOR. It is also denied by the deputy commander of the Bosnian Serb army general staff, General Milan Gvero, who says to Tanjug news agency: “Poisonous gases were never produced in former Yugoslavia and the VRS therefore has none in its possession” [see also 7-8 Dec]. General Gvero also says that it was the Muslim side that had been using poison gases — in order to accuse the Serbs and provoke a military intervention against them. {Tanjug 10 Apr in FBIS-EEU and BBC-SWB 11 Apr}

**11 April** The US Army submits to the Congress its report on chemdemil technologies alternative to the baseline disassembly and incineration process, as required by Public Law 102-484. The report includes an evaluation of the recommendations of the National Research Council [see 4 Feb] and considers comments offered by concerned citizens residing near each of the stockpile sites.

The report is released next day, the Army announcing that it plans to continue implementing the chemdemil programme using the baseline technology, as recommended by the NRC. A \$200 million research effort will be put in hand, if the Congress approves and funds it, for detailed study of two of the more promising of the alternative technologies: neutralization (presumably followed by incineration), and neutralization combined with biological degradation. {*Inside the Pentagon* 14 Apr; *Chemical & Engineering News* 18 Apr}

The Chemical Demilitarization Citizens’ Advisory Commissions at seven of the eight US stockpile locations (only Arkansas, home of Pine Bluff Arsenal, has not yet formed one {*Chemical Demilitarization Update* Apr special edition}) now have 60 days — i.e. through 11 June — to present the concerns of their communities directly to Congress.

**11–15 April** In Geneva there is a meeting of the Preparatory Committee for the Special Conference of States Parties to the Biological Weapons Convention. Participating are 61 of the

states parties and one state signatory. They elect Ambassador Tibor Tóth of Hungary as chairman, with the recommendation that he also preside over the Special Conference itself. Mr Sohrab Kheradi, Deputy Director of the UN Centre for Disarmament Affairs, serves as Secretary of the Committee. The Committee decides that the Special Conference should take place in Geneva during 19-30 September, and adopts a provisional agenda for it. The central agenda item is to be “consideration of the [VEREX report] and decision on any further action with a view to strengthening the Convention” {BWC/SPC/PC/6; UN press release DC/2470}

One country, unidentified, reportedly distributes a paper within the Western Group discussing and outlining the verification protocol that might be negotiated for the BWC.

Brazil announces that it will be hosting a seminar on the BWC in Sao Paulo in early August. {*Arms Control Reporter* at 701.B.127-128}

**11–15 April** In The Hague, the OPCW Preparatory Commission convenes for its sixth plenary session. The Chemical Weapons Convention has now been signed by 157 states (Bahamas, St Kitts & Nevis and Tanzania having done so during the intersessional period) of which 103 had accredited or provisionally accepted representatives to the Commission, but only 79 participate in this session. Decisions are taken on a broad range of matters [see *Progress in The Hague*, p 7 above], including the OPCW Building, principles for the OPCW’s computer security policy, the classification system for the Commission’s confidential information, and certain technical aspects of compliance verification. The UN Secretary-General, as depositary of the Convention, is asked to correct the numerous clerical errors that have been identified in all six language versions of the text as signed in Paris (errors which are listed in document PC-VI/7\* and Corr.1). Eight delegations speak of the good progress which their countries are making towards ratification: Australia, Bulgaria, Germany, Mexico, the Netherlands, Romania, Russia and the United States. Statements made on behalf of the Asian Group and the Latin American & Caribbean Group draw particular attention to Article XI (Economic and Technological Development) of the Convention. A date is agreed for the seventh plenary session: 27 June to 1 July. {PC-VI/22}

**12 April** US Army Special Operations Command spokesman George Grimes says that chemical agents are to be studied by the Command to determine whether they might improve the combat performance of special forces. Funding is being sought to investigate such drugs as melatonin (used to reduce the severity of jet lag), modafinil (used to combat sleep deprivation) and the various performance-enhancing chemicals used by weight-lifters and marathon-runners. {*Defense News* 18-24 Apr}

**13 April** In the US House of Representatives, the Armed Services Readiness Subcommittee receives in closed session a briefing from the Defense Intelligence Agency and other Defense Department witnesses on the CBW preparedness of US and South Korean forces. {*The Week Ahead* 11 Apr}

**13 April** In the US Senate, the Foreign Relations Committee has a second session of its ratification hearings on the Chemical Weapons Convention [see 22 Mar]. Testimony is taken from Ambassador Stephen Ledogar, who led the US negotiating team while the Convention was being completed. He pres-

ents a detailed overview of the negotiation, an article-by-article and annex-by-annex explanation of what the Convention says, an explanation of the relationship between the Convention and the Russo-US Bilateral CW Destruction/Nonproduction Agreement, and an account of the OPCW Preparatory Commission.

Condensed as it had to be, Ambassador Ledogar's testimony inevitably simplifies some of the nuances in the treaty text, even to the point of distortion. For example, on the delicate issue of 'riot control agents', he states that these "are defined in a section separate from chemical weapons to indicate that while the Convention prohibits their use as a method of warfare, they themselves are not considered chemical weapons". Such a portrayal carries the erroneous and dangerous implication that the general purpose criterion enunciated in Article II somehow does not apply to chemicals that happen to have usefulness in controlling riots.

**13 April** In the UK, the Home Secretary is urged by chief constables attending the quarterly council meeting in London of the Association of Chief Police Officers to approve the issue of oleoresin capsicum sprays [see 31 Mar] — "pepper gas" — to police officers on routine patrol. {*Times* (London) 15 Apr}

**15 April** Bosnian Vice-President Eyup Ganic, after visiting the US Secretary of State in Washington, speaks at a news conference of evidence that Bosnian Serbs have been using Russian-made chemical weapons [see 9 Apr]. {Federal News Service 18 Apr} Later, the US State Department issues a statement saying that there has been "no credible information that the Bosnian Serbs are using chemical weapons", but noting that "an ammonia chemical plant just outside of Gorazde has been badly damaged by shelling from Bosnian Serb forces". The statement continues: "Reports indicate that ammonia gas is leaking into the air and into the Drina River". {Reuters 19 Apr}

**15 April** Due date for BWC states parties to submit their annual returns of information in accordance with the expanded confidence building measures agreed at the 1991 Review Conference [see 27 Sep 91]. During 1993 a total of 39 countries had made such returns: Argentina (22 Jul), Australia (16 Apr), Austria (13 Apr), Belarus (10 May), Brazil (3 Aug), Bulgaria (18 May), Canada (29 Apr), China (19 Apr), Cuba (14 May), Cyprus (2 Jul), Denmark (26 Jul), Ecuador (29 Mar), Finland (3 Jun), France (15 Apr), Germany (19 Apr), Hungary (19 Apr), Iceland (20 Apr), Iraq (28 Apr), Ireland (18 Feb), Italy (15 Apr), Japan (27 May), Korea, South (20 May), Kyrgyzstan (25 May), Mongolia (6 Jul), Netherlands (19 Apr), New Zealand (24 May), Nicaragua (15 Apr), Norway (16 Apr), Romania (15 Apr), Russia (16 Apr), Slovenia (15 Jul), South Africa (10 Sep), Spain (9 Jul), Sweden (29 Mar), Switzerland (8 Jul), Turkey (16 Apr), Ukraine (29 Mar), UK (13 Apr) and USA (15 Apr).

**16 April** In Sri Lanka, port officials in Colombo, acting on information transmitted by Interpol, impound a shipment of phosphorus pentasulphide en route from Bombay to Israel via Egypt. Sri Lanka has asked Interpol for help in investigating the shipment. {SLBC 18 Apr in BBC-SWB 22 Apr; Reuter 20 Apr} The chemical, which is on the Australia Group precursor control list, can be used to make amiton-type nerve gases.

**18 April** The UK government responds as follows to a question in parliament about the so-called 'Gulf War syndrome' affecting spouses and children of people who served in the Gulf war [see 9 Feb]: "[The Ministry of Defence] has received repre-

sentations relating to seven cases where it is alleged that there may be some linkage between service in the Gulf and subsequent medical problems among spouses or children of service personnel". {*Hansard (Commons)* written answers 18 Apr}

More than 280 British Gulf war veterans have by now submitted claims to the Ministry of Defence alleging illnesses they believe are attributable to the conflict. The Minister of State for the Armed Forces, Jeremy Hanley, has said that the Ministry retained "an open mind" on the matter, but added that those who had undergone a full medical examination had shown no link between their problems and their service in the Gulf [see also 21 Feb]. {*Independent* (London) 1 Apr}

**18 April** In Washington it is announced that the former USACDA Assistant Director for Multilateral Affairs, Michael Moodie, has been appointed president of the Chemical and Biological Arms Control Institute. {*Defense News* 18-24 Apr}

**18-22 April** In Iraq the fifteenth UN chemical inspection team, UNSCOM 74, led by Horst Reeps of Germany and numbering 7 people, interviews senior Iraqi officials in order to verify information about Iraq's past chemical-weapons programme given during the recent round of high-level talks [see 14-19 Mar]. The team is also given new documentation about the programme. {AFP 17 Apr; Reuter 18 Apr; AFP 22 Apr}

**19 April** In Bosnia-Herzegovina, "enemy planes" overflying Serbian positions on the Glamoc front release "thick toxic smoke", according to a Serbian broadcast which says that the propellor-driven aircraft "left behind a thick veil of smoke forcing all Serbian fighters on the front line to seek urgent medical care to deal with breathing discomforts and sharp stomach pains". The broadcast goes on to quote Serbian military sources saying they believed an as yet unknown poison gas had been used for the first time. Samples had been collected for analysis in Banja Luka. {e Srpski Radio-Televizija 20 Apr in FBIS-EEU 21 Apr}

Meanwhile reports of Serbian use of chemical weapons in Gorazde continue to be heard [see 9 Apr]. A reporter from Gorazde on Radio Bosnia-Herzegovina {19 Apr in BBC-SWB 21 Apr} says: "These chemical agents have psychological effects and with them the Serbs want to create panic among the residents". The Serb command denies the reports, saying that it was Muslim forces that were using chemical weapons, for which they had a factory in Gorazde. {Tanjung 19 Apr in BBC-SWB 21 Apr}

**19 April** In Ukraine, research institutes were given assignments by the leadership about a year ago to "develop binary chemical and bacteriological weapons" according to a report published in the Russian newspaper *Komsomolskaya Pravda*. The Russian Foreign Ministry says it has not received official reports confirming that such work has been under way in Kiev. The Ukrainian embassy in Moscow dismisses the report as nonsense. {*Russian Press Digest* 19 Apr}

**20-21 April** In Moscow, a two-day international Symposium on Chemical Weapons takes the place of the originally scheduled three-day international Conference on Chemical and Biological Arms Control, Demilitarization and Conversion, MOSCON 94, organized under joint Russian and US auspices once again [see 19-21 May 93] and now tentatively rescheduled for 19-21 October. The symposium, held at the Academy of Sciences, is opened by Academician Anatoliy Kuntsevich



## Guidelines on Riot Control Agents

There has been some controversy as to the status of riot control agents under the Chemical Weapons Convention. In fact, however, the status of these agents is clear from the Convention's text. Every "riot control agent," as defined in Article II(7), is also a "toxic chemical," as defined in Article II(2). Thus, riot control agents are subject to the General Purpose Criterion of Article II(1)(a), which applies by its terms to "toxic chemicals." Under that provision, riot control agents are "chemical weapons" "*except where intended for purposes not prohibited under this Convention, as long as the types and quantities are consistent with such purposes.*" The definition of "purposes not prohibited under this Convention" appears in Article II(9); it includes both II(9)(c), "military purposes not connected with the use of chemical weapons and not dependent on the use of the toxic properties of chemicals as a method of warfare," and Article II(9)(d), "law enforcement purposes including domestic riot control." If toxic chemicals, including riot control agents, are produced, held or transferred for purposes other than these permitted purposes, or in types or quantities inconsistent with those purposes, then they are "chemical weapons" and are subject to the Convention's declaration and destruction requirements. For instance, a stockpile of 105mm howitzer shells loaded with a riot control agent would be a "chemical weapon" and be subject to the Convention's restrictions. But, although riot control agents can be chemical weapons under certain circumstances, virtually all currently intended United States uses of riot control agents are permitted by the Convention.

A number of questions of interpretation may arise with respect to the Convention's provisions on riot control agents and other toxic chemicals. The following statements are offered as guidelines to help resolve such problems.

1. The term "law enforcement" in Article II(9)(d) means actions taken within the scope of a nation's "jurisdiction to enforce" its national law, as that term is understood in international law. When such actions are taken in the context of law enforcement or riot control functions under the authority of the United Nations, they must be specifically authorized by that organization. No act is one of "law enforcement" if it otherwise would be prohibited as a "method of warfare" under Article II(9)(c).
2. The uses of toxic chemicals prohibited as "methods of warfare" include any use of toxic chemicals by virtue of their toxic properties against enemy combatants (whether regulars or irregulars), and any use of toxic chemicals by virtue of their toxic properties against noncombatants if designed to advance a specific military objective in war.
3. A toxic chemical used by virtue of its toxic properties is only of a type consistent with the purpose of law enforcement, in the sense of Article II(1)(a), if it meets the Convention's definition of a "riot control agent" in Article II(7). Thus, such chemicals must be "not listed in a Schedule" and must "produce rapidly in humans sensory irritation or disabling physical effects which disappear within a short time following termination of exposure." However, any chemical not on Schedule I may be used in carrying out the sentence of a duly constituted tribunal against a natural person.

*[an excerpt from Proposed Guidelines on the Status of Riot Control Agents and Other Toxic Chemicals under the Chemical Weapons Convention by Abram Chayes, Matthew Meselson and R Justin Smith]*

[see 7 Apr]. {ITAR-TASS 20 Apr in FBIS-SOV 21 Apr; *Toronto Star* 30 Apr}

**20–22 April** US Army Worldwide Chemical Conference XIII takes place at the Army Chemical School, Fort McClellan, together with the American Defense Preparedness Association's 1994 NBC Operations Symposium. {*National Defense* Feb}

**21 April** In Germany the Bundestag debates ratification of the Chemical Weapons Convention. It has multilanguage translations of the treaty (German, English and French texts in parallel columns) {BT-Drs 12/7206} and a memorandum on it by the Federal government {BT-Drs 12/7207}. Speakers from all parties welcome the treaty, but concern is expressed about how universal adherence is to be achieved, and about how Russia is going to destroy its chemical weapons. {*Deutscher Bundestag* 21 Apr, pp 19240-49}

**22 April** The UN Secretary-General submits to the Security Council a fifth 6-monthly report on implementation of the UNSCOM plan for ongoing monitoring and verification in Iraq, as required by Security Council resolution 715 (1991). Now that Iraq has formally accepted the latter resolution [see 26 Nov 93], the report is considerably fuller than its predecessors, detailing preparatory activities that have been initiated for implementing the OMV plan [see 14-19 Mar].

The report states that Iraq has declared a total production of CW agents of 4340.5 tons. The latest Iraqi declaration of total traceable imported precursor chemicals is 17,657 tons. {UN doc S/1994/489}

**ca 22 April** The US Defense Department announces its intention to replace the *Patriot* antimissile missile with ERINT [see 15 Feb], citing the greater effectiveness and safety of the hit-to-kill ERINT in the face of possible attacks from ballistic missiles armed with nuclear or CBW warheads. {*Atlantic News* 29 Apr}

**22 April** In Sao Paulo, the conference of Foreign Ministers of Rio Group member-states and representatives of the European Union adopt a joint communiqué, the *Sao Paulo Declaration*, which among other things calls for worldwide ratification of the Chemical Weapons Convention and for strengthening of the Biological Weapons Convention. {EFE 22 Apr in BBC-SWB 25 Apr; ITAR-TASS 23 Apr}

**24–26 April** In Iraq, UNSCOM Executive Chairman Rolf Ekéus has high-level talks with Iraqi officials during which it is agreed to accelerate the process of establishing the on-going monitoring and verification regime. Speaking to reporters after the talks, Chairman Ekéus says that Iraq had provided some very important information about its chemical weapons programme, although more was still needed in order to operate the OMV plan. {AFP 24 Apr; Xinhua 26 Apr}

**25 April** In the UK, the universities have rejected a government proposal for vetting their intakes of overseas students and researchers in order to exclude any who might use the knowledge they acquired to develop nuclear or CBW weapons, so *The Independent* newspaper reports. Such controls on transfers of "intangible technology" had been mooted a year previously [see 10 Mar 93]. Under the now-rejected plan, the government would list for the universities 11 countries and 17 academic disciplines that in combination were "a prima facie cause for concern". {*Independent* 25 Apr}

**26 April** In the US Senate, the Armed Services Subcommittee on Nuclear Deterrence, Arms Control and Defense Intelligence holds a hearing on the US chemdemil programme. Testimony from the Army, the National Research Council and the General Accounting Office {GAO/T-NSIAD-94-159} displays the convergence of view evident in the recent reports on the programme by these three organizations [see, respectively, 11 Apr, 4 Feb and 18 Mar], namely that the Army's baseline technology of reverse-assembly and incineration is the best way to proceed under the circumstances, notwithstanding environmentalist opposition to incineration: the risks of delaying incineration of a deteriorating stockpile are not outweighed by the advantages that might possibly be gained by waiting for the alternative technologies to become sufficiently available. The NRC witness, Dr Carl Peterson of MIT, cautions against "a drift toward total stagnation in this program". Pursuing this theme later, one commentator observes that the Army is in danger of becoming trapped "between the mandate to dispose of the chemicals and the concerns of vocal opponents, including state regulators, who do not want the materials burned, transported or kept where they are". Senator Exon, the chairman of the subcommittee, says: "We've just got to move ahead on this. We are never going to come up with a plan that's totally acceptable to everyone." He rejects the criticism that the Army has failed to pay proper attention to alternative technologies: "I'd say the Army has bent over backward". {*Washington Post* 27 Apr}

The Army testimony states that the latest life-cycle cost estimate for the total chemdemil program, due out in late summer, will be an increase over the 1993 one of \$8600 million, but the deadline for completion of the programme, December 2004, will be retained. Including the \$851 million programmed for FY 1995, the US chemdemil programme will have consumed \$3400 million by the end of that year.

**26 April** The UK Defence Ministry, in its *Statement on the Defence Estimates 1994* released today, observes: "It may be some time before all states finally accede to the CWC and the Government will therefore ensure that other measures to deter the proliferation and use of chemical weapons (such as the chemical warfare defence programme and export controls) are maintained at an appropriate level."

Noted elsewhere in the White Paper: "Since the Gulf conflict, scientists at the Chemical and Biological Defence Establishment have increased their efforts to develop effective vaccines against biological weapons agents which might be used against the United Kingdom's armed forces. CBDE has recently patented a genetically engineered vaccine against gas gangrene, an infection of serious wounds. Most cases of gas gangrene are caused by *Clostridium perfringens*, a bacterium which occurs widely in nature but which has also been linked to biological weapons programmes." {Cm 2550}

**26–28 April** In London, British, Russian and US officials meet for talks, within the framework of the trilateral *Joint Statement on Biological Weapons* [see 10-11 Sep 92], to establish procedures for exchanging visits to military biological facilities. The US team is reportedly led by Ambassador James Goodby. {*Arms Control Reporter* at 704.B.128}

**27–28 April** In The Hague there is the second combined meeting of chemical industry representatives and the OPCW Preparatory Commission Expert Group on Chemical Industry Facilities (now 'Issues') [see 6-7 Oct 93]. The participants in-

clude people from the chemical industries of Algeria, Bulgaria, China, France, Germany, India, Italy, Japan, the Netherlands, Poland, Russia, Sweden, the UK and the USA, as well as delegations from 34 member states and the European Chemical Industry Council. The PTS had prepared 12 "Fact Sheets", each one addressing a particular problem (such as: "Does the term 'production' under Article VI cover biotechnological production processes such as fermentation, or biologically mediated processes?") and setting out a possible solution with underlying reasoning. These pre-distributed papers have been intended to stimulate the participants into preparing themselves for the discussions. {PC-VI/B/7} The meeting is organized into three workshops, each with a moderator from the delegations and with support from the PTS: on confidentiality, on operations and safety, and on reporting and administrative issues. The PTS later publishes a detailed analytical account of the views and suggestions put forward in each workshop. {OPCW/PTS *Information Series B (Chemical Industry)* no 2}

**28 April** In Seoul, North Korean defector Li Chung-kuk [see 22 Mar] tells a news conference that North Korea has the technology to mount chemical warheads, but not nuclear warheads, on its Scud missiles. Such missiles have been targeted, he says, on Okinawa and Guam, and also China. {*Washington Times* 29 Apr}

**29 April** The UK government responds as follows to a question in Parliament about the status in international law of the UN Security Council statement of 31 January 1992, a statement which had declared that "the proliferation of all weapons of mass destruction constitutes a threat to international peace and security": "The statement...made by the President of the Security Council on behalf of Council members was a summation of points discussed and agreed at the meeting, but was not designed to have legal effect". {*Hansard (Lords)* written answers 29 Apr}

**29 April–1 May** In the United States, at the National Institutes of Health campus in Bethesda, Maryland, a workshop on 'The Persian Gulf Experience and Health' is conducted by an NIH advisory panel of 12 independent experts jointly sponsored by five government agencies [see also 28 Feb]. There is a wide range of participation, focussed on the putative 'Gulf War Syndrome' [see 18 Apr]. The panel comes to the conclusion that many US veterans of the Gulf War are indeed suffering, some of them very seriously, from illnesses of unknown cause, but that no single syndrome is discernible. The panel does not rule out any of the reasons for the illness that have been suggested, including exposure to CBW agents and side-effects of the widely used nerve-gas pretreatment drug pyridostigmine; but the panel does place Post Traumatic Stress Syndrome and the parasitic disease leishmaniasis high on the list of likely causes. The panel recommends (a) that a health survey be carried out of the nearly 700,000 individuals who served in the Persian Gulf during the war, and (b) that extensive research be conducted into unexplained symptoms being reported by Gulf-War veterans. {AP in *New York Times* 1 May; *Nature* 5 May}

Meanwhile, in the United Kingdom, a spokesman for the Ministry of Defence says: "The MoD does not agree that there is anything such as Desert Storm Syndrome, but we still maintain an open mind [see 18 Apr]. There is no evidence that any serviceman from the UK has any syndrome." {*Times* (London) 2 May}

**2 May** In Qatar, the Arms Control and Regional Security multilateral working group of the Middle East Peace Process convenes for the start of its sixth round. The fifth round had taken place in Egypt during February [see also 3-4 Nov 93]. There is participation from Israel, the Palestinians, and about a dozen Arab states (though neither Syria nor Lebanon), with more expected later. The co-sponsors of the Peace Process — Russia and the United States — jointly propose a draft *Declaration of Principles and Statements of Intent on Arms Control and Regional Security*. This envisages, as its final objective, "establishing a zone free of all weapons of mass destruction, including nuclear, chemical and biological weapons and their delivery systems". {*Reuter* 1 May; *Mideast Mirror: the Arab/Islamic World* 3 May}

**3 May** In Burma, the State Law and Order Restoration Council may have been using biological weapons since last August against Karen guerrillas in the Thai border area, according to a compilation of data purportedly from eye-witness accounts assembled by a Canadian human-rights activist, and now reported in the Canadian press. {*Southam News* 3 May} The compilation had been given to foreign diplomats in Bangkok at the end of April, and then to officials of External Affairs Canada in Ottawa on 29 April. Sudden outbreaks of cholera-like disease have reportedly been occurring within days of military air-drops of balloons containing a foul-smelling dark liquid.

**6 May** Australia deposits with the UN Secretary-General its instrument of ratification of the Chemical Weapons Convention, becoming the sixth country to have done so. {*Xinhua* 7 May}

**6 May** In the US Senate the Committee on Veterans' Affairs conducts a hearing on the theme "Is military research hazardous to veterans' health? Lessons from the cold war, the Persian Gulf, and today" to examine the results of a 6-month investigation by Committee staff. The unexplained illnesses suffered by Desert Storm veterans [see 29 Apr–1 May] are the main focus. Testifying are four afflicted veterans; scientists and officials from four federal agencies; and other experts. {*New York Times* 7 May}

**9–10 May** In Bangkok there is a regional seminar on National Implementation of the Chemical Weapons Convention [see also 7-8 Dec 93]. It is jointly organized by the government of Thailand and the OPCW Provisional Technical Secretariat. The participation is from fifteen countries in the region, from the PTS and from nongovernmental organizations including the ASEAN Chemical Industries Club, the Harvard Sussex Program and SIPRI.

Some national delegations reported on the progress being made by their countries towards ratification of the CWC. Vietnam has an interdepartmental group studying the tasks that have to be completed before ratification. Progress in Thailand and Indonesia is being held up by translation of the CWC into the national languages. China and Japan are working towards ratification. South Korea hopes to ratify later in the year, but its northern neighbour's threatening behaviour is for the moment making any sort of disarmament unpopular domestically.

**10 May** In the United States, a death sentence is executed in the state of Illinois by means of lethal injection. The toxic chemicals used are sodium pentothal, pancuronium bromide and potassium chloride, administered in succession through an

intravenous tube at one-minute intervals. {*Daily Telegraph* 11 May}

**11 May** Albania deposits with the UN Secretary-General its instrument of ratification of the Chemical Weapons Convention, becoming the seventh country to have done so.

**12 May** In Washington, the Assistant to the Secretary of Defense for Atomic Energy, Dr Harold Smith, speaks of US assistance for the Russian chemdemil programme at a seminar organized by the Henry L Stimson Center [see 8 Mar]. He says that the Administration will ask Congress to help fund construction of a \$500 million destruction facility if Russia continues to make progress toward compliance with the CWC [see also 15 Mar]. A second US-funded facility might follow. {*Defense News* 23-29 May}

**13 May** In the US Senate, the Foreign Relations Committee has a third session of its ratification hearings on the Chemical Weapons Convention [see 13 Apr]. Testimony is taken from Walter Slocombe, Acting Under Secretary of Defense for Policy, and from Dr Harold Smith, the Assistant to the Secretary of Defense for Atomic Energy, both of whom strongly urge early ratification. Secretary Slocombe presents an overview of the security significance of the CWC. He observes: "It is important to note that three quarters of the countries believed to have chemical weapons programs have signed the Chemical Weapons Convention. The remaining quarter have isolated themselves. Should they remain outside the Convention after it enters into force, they will be subject to the trade restrictions on specific chemicals under the CWC." On the renunciation of CW retaliatory capability he says: "as we stated during the Gulf War, if any country were foolish enough to use chemical weapons against the United States the response will be 'absolutely overwhelming' and 'devastating'. We do not need chemical weapons to deliver an effective response to CW."

Secretary Slocombe goes on to address other specific aspects of the treaty "of direct concern" to the Defense Department, including the matter of riot-control agents [see 13 Apr]: "The Convention does...prohibit the use of RCAs as a method of warfare. The Administration understands that this prohibition applies only to their use as a method of warfare in international and internal armed conflict. Use of RCAs for operations such as normal peacekeeping operations, humanitarian and disaster relief missions, and counter-terrorism and hostage rescue are unaffected by the CWC." He goes on to say that, for US forces, the use of RCAs in war is currently guided by Executive Order 11850 of April 1975. (This forbids "the first use of riot control agents in war except in defensive military modes to save lives".) Secretary Slocombe says that the Administration is still reviewing the matter of "how, if at all" the CWC's prohibition on RCA use as a method of warfare affects the Order.

Dr Smith says in his testimony that he believes many countries are closely watching the ratification actions of the United States, and will ratify as soon as they are convinced that the United States is serious about doing so ahead of the 17 July deadline. As Secretary Slocombe had done, he describes the CWC verification regime as "effective"; it is "the most intrusive of any existing bilateral or multilateral accord". He continues: "The CWC's verification provisions will help give us confidence that violations are not occurring. These verification provisions, however, are effectively balanced by certain safeguards and we consider that the treaty strikes the proper balance between intrusiveness and the protection of privacy, proprietary informa-

tion, and national security. He speaks of the support being provided by the Defense Department to the international CWC organization, observing that "it is possible that no fewer than one quarter of the international inspectorate serving the OPCW will have been trained and certified at DOD facilities in the United States". Again emphasizing a matter stressed by Secretary Slocombe, he says that "the Department of Defense Chemical Biological Defense Program will not be diminished in any way by entry into force of the CWC... American military forces will continue to be the best prepared and equipped in the world to deal with warfighting in a CW environment."

**16-19 May** The Australia Group [see 6-9 Dec 93] meets in Paris. Its subsequent press release describes the proceedings as "informal consultations". It makes no specific reference to the conflict which some governments have said they see between the Group and the CWC, but it does include the following: "Despite these international agreements [the BWC and the CWC], there are active chemical and biological weapons programs underway in some proliferating [*sic*] countries. Hence the continuing need for national measures to prevent civilian industry and traders from becoming unwitting contributors to CBW programs. Export licensing is consistent with, and indeed actively supports, the requirement under Article I of the CWC that States Parties never assist, in any way, the manufacture of CW. These measures are also consistent with the undertaking in Article XI of the CWC to facilitate the fullest possible exchange of chemical materials and related information for purposes not prohibited by the Convention, as they are focussed solely on preventing assistance to activities banned under the CWC. Similarly, such efforts also support existing nonproliferation obligations under the BTWC."

The Czech Republic is to join the Group in November. {Australia Group doc AG/May94/Press/Chair/13}

**17 May** In the US Senate, the Foreign Relations Committee has a fourth session of its ratification hearings on the Chemical Weapons Convention [see 13 May]. Testimony is taken in open session from Maj-Gen John Landry, speaking for the Intelligence Community, and Donald Mahley, Acting Assistant Director of ACDA. General Landry addresses the ability of the US intelligence community to monitor the CWC, going into the subject in greater detail in a closed hearing later in the day. He says: "despite the strong verification regime embodied in the CWC, the intelligence monitoring of this agreement will prove to be a monumental task... That said, we believe that the transparency and verification provisions of the Convention will contribute to our ability to focus collection and analysis to detect and assess the most threatening CW programs."

Donald Mahley addresses the verifiability of the CWC, also in both open and closed sessions. He observes: "The Intelligence Community monitoring effort is one element designed to provide evidence contributing to US verification and compliance judgements". He explains how the Administration arrived at its assessment that the Convention is clearly in the interests of the United States. "That judgement rests in part on the verification regime analyzed in the [verification] report [submitted to the Congress in accordance with Section 37 of the Arms Control and Disarmament Act]. It also rests on the unique value of the Convention as a mechanism for rolling back CW proliferation and as a bulwark against further CW spread and use." He closes: "Simply put, we are better off with the Convention than without it. There is no better alternative."

**19 May** The Brussels office of UNITA — the Union for the Total Independence of Angola — releases a statement once again accusing the Angolan government of “using chemical weapons...to wage war on the population”. {Reuter 19 May}

**22–27 May** In Naaldwijk, Netherlands, there is a NATO Advanced Research Workshop on Destruction of Military Toxic Materiel.

**25 May** In Iraq the sixteenth UN chemical inspection team, led by Rod Godfrey of the United Kingdom and numbering 10 people, arrives in Baghdad to “begin to design the technical measures necessary to implement monitoring of Iraq’s chemical plants”, according to UN spokesman Roald Opsahl. {Reuter 23 May}

**25 May** Dr Vil Mirzayanov [see 24 Mar] publishes an article about the CWC in *The Wall Street Journal*, in both the European and the US edition. In the article he warns that “the treaty as it stands will help, not hinder, Russia’s production of deadly chemical weapons”. This is because the Russian negotiating team “succeeded in inserting loopholes into the convention that allowed Russia to proceed with its secret program”. That program, he says, rested on two “major achievements” of 1990-91: the commencement of production of a binary weapon based on Substance 33 [see 31 Jan 93 and 8 Dec 93], and “the synthesis [sic] of a binary weapon based on Substance A-232 [which is]...part of the ultra-lethal ‘Novichok’ class [see 8 Dec 92 and 31 Jan 93]”. He says that neither of these substances, which he does not identify beyond their cryptonyms, is listed in the CWC (presumably he is referring here to the schedules in the Annex on Chemicals). Apparently he believes that these substances are somehow exempt from the general purpose criterion which defines the scope of the CWC’s prohibitions, for his article continues: “If a weapon is not listed, then it cannot legally be banned, to say nothing of being controlled”. It is this — in fact flawed — line of reasoning that has stimulated Dr Mirzayanov’s warning: “The chemical generals are banking on this technicality... Our generals see the implementation of the treaty with its loopholes as a way to dispose of their obsolete and hazardous stockpiles with American taxpayers’ help, while preserving their new classes of toxins and, even worse, permitting their sale abroad for hard currency”. The article accordingly ends with a recommendation that the negotiations which produced the CWC now be reopened.

**25 May** In the US Senate, the Committee on Banking, Housing, and Urban Affairs conducts a hearing on US export policy as it relates to shipments of BW-related materials to Iraq by US companies prior to the Gulf War. Chairman Donald Riegle has called the hearing both to review export-control policies under the Export Administration Act [see 8 Mar] and as part of his continuing investigation into the so-called ‘Gulf War Syndrome’ [see 9 Feb]. He releases a lengthy staff report which presents evidence showing it to have been theoretically possible for there to have been widespread exposure among US forces in the Gulf area to low levels of CW agents, and perhaps even BW agents as well. The Committee hears testimony from Defense Department, DIA and CIA witnesses. {*Washington Post* 26 May; AP in *International Herald Tribune* 26 May}

Under Secretary of Defense (Personnel and Readiness) Edwin Dorn speaks of the efforts being made of behalf of Gulf War veterans by his Department and the Department of Veter-

ans Affairs. He says: “DoD and VA doctors have treated thousands of Persian Gulf veterans for readily identifiable illnesses and injuries; but we know of about 2,000 people for whom a clear diagnosis continues to elude physicians.”

The Director of the Nonproliferation Center at the CIA, Dr Gordon Oehler, testifies on the US intelligence community’s assessments of Iraqi CBW capabilities prior to the Gulf War, on the means whereby Iraq acquired its CBW and other mass-destruction weapons, and on the part played by US intelligence agencies in efforts to restrict CBW-related technology transfers to Iraq. In the course of his testimony he says that, by early 1990, US intelligence had calculated that the Iraqi CW-weapons production facility at Al-Muthanna was capable of producing more than 2000 tons per year of blister and nerve agents. Also: “With regard to biological weapons, we estimated, prior to the start of the war, that Iraq had a stockpile of at least one metric ton of biological warfare agents, including anthrax and botulinum toxin.”

**25–26 May** In Finland, at Keuruu, there is an international symposium on NBC defence. It is cosponsored by three Finnish defence organizations: the Scientific Committee for National Defence, the Research Centre for the Defence Forces, and the School of NBC Defence.

**27 May** In the US Congress the Office of Technology Assessment publishes a study of US *Export Controls and Nonproliferation Policy* {OTA-ISS-596}. This is the latest installment of its assessment on the proliferation of weapons of mass destruction [see 21 Sep 93] that had been requested by several Congressional committees.

**27–29 May** The Pugwash Study Group on Implementation of the CBW Conventions holds its second workshop in the Netherlands, with the opening session in The Hague, at the Netherlands Foreign Ministry, and then in Noordwijk. The main agenda item is ‘Law enforcement, domestic riot control, and the Chemical Weapons Convention’. Also considered are possible future relationships between the CWC and the BWC.

**28 May** In Iraq the fifth UN biological inspection team, led by Dave Franz of the United States and numbering 10 people, arrives in Baghdad to continue, as the team leader puts it to reporters, “the assessment of the biological capability and to begin construction of an inventory of equipment that can be used for legitimate purposes or for offensive biological purposes, whether it be research, development or production”. The purpose is to develop the technical baseline for UNSCOM’s ongoing monitoring and verification in the biological field. {Reuter 27 and 28 May}

**30 May–1 June** In Geneva the International Committee of the Red Cross holds an Expert Meeting on ‘Certain Weapon Systems and on Implementation Mechanisms in International Law’, as part of its preparatory work for the Inhumane Weapons Convention Review Conference [see 28 Feb-4 Mar]. Among the presentations given is one on ‘Developments in “non-lethal weapons” involving chemicals’.

**31 May** The Maldives deposits with the UN Secretary-General its instrument of ratification of the Chemical Weapons Convention, becoming the eighth country to have done so.

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## Forthcoming Events

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The 7th plenary session of the OPCW Preparatory Commission will take place in The Hague during 27 June–1 July 1994.

The US Defense Intelligence Agency is to present a Secret-Nofoan conference on "Chemical and Biological Warfare—Focus on the Future" at Bolling AFB, 28–30 June 1994.

The Special Conference of States Parties to the Biological Weapons Convention will take place in Geneva during 19–30 September 1994.

The fifth Wilton Park arms control seminar (Wiston House, England, 30 September–2 October 1994) will be on "Implementing the Chemical Weapons Convention". Enquiries about participation to Elizabeth Harris, Wilton Park Conferences, telephone \*\*44-903 815020, fax \*\*44-903 815931.

The 15th Kühlungsborn Colloquium will take place on Insel Vilm, Germany, 12–16 October 1994. The topic is "Biological and Toxin Weapons Research, Development and Use 1925–45: Lessons for the Future".

The postponed Second Moscow Conference on Chemical and Biological Arms Control, Demilitarization and Conversion, MOSCON 94, is now tentatively rescheduled for 19–21 October 1994.

The Hague Academy of International Law, in cooperation with the OPCW/PTS and UNIDIR, will conduct a workshop on "The Convention on the Prohibition and Elimination of Chemical Weapons: A Breakthrough in Multilateral Disarmament" during 24–26 November 1994.

## Antichemical Protection and the Chemical Weapons Convention

edited by *Priyamwada Deshingkar, Matthew Meselson and Julian Perry Robinson*

"It is possible to protect people against chemical weapons without at the same time so immobilizing or burdening them that they are unable to function effectively. This is true of no other category of modern battlefield weapon."

In this lies the key to the crucial relationship now being established between the new chemical treaty and protection against chemical weapons. HSPOP 2 shows why this is so, and why the treaty should not obstruct development of protection.

Antichemical protection may promote compliance with the Chemical Weapons Convention by reducing the incentive for having chemical weapons. It may enhance the effectiveness of verification by forcing a would-be violator to increase the scale and therefore the detectability of any production, storage or other proscribed activities undertaken. If noncompliance nevertheless happens, antichemical protection may render it less dangerous.

The implications of the Convention for the future role and design of antichemical protection and, conversely, the implications of antichemical protection for the successful implementation of the Convention were the chief topics before the *El Escorial Workshop on Antichemical Protection and the Chemical Weapons Convention*, of which HSPOP 2 is a record.

The Workshop, held while the Convention was in the final phase of negotiation, was hosted by the Complutense University of Madrid and the Spanish Pugwash Group, and was organized by the Harvard Sussex Program in collaboration with the Pugwash Conferences on Science and World Affairs. Besides conveners and organizers, the Workshop brought together 20 experts from 16 countries, most of them specialists in physical or medical aspects of protection against chemical warfare and some of them members of their countries' negotiating delegations in Geneva.

**Contents:** *Matthew Meselson and Julian Perry Robinson*, Introduction, overview and conclusions; *Julian Perry Robinson*, The emerging Chemical Weapons Convention; *Matthew Meselson*, The role of chemical defense in chemical warfare, chemical deterrence and chemical disarmament; *Jan Medema*, Realistic chemical challenge levels for design of antichemical protection; *Herbert C DeBisschop*, Detection and identification of chemical warfare agents; *Derek L Griffiths*, Evolution and performance of modern respirators and filters; Some thoughts on collective protection; *David W Pike*, Evolution and performance of protective clothing; *S M Asim*, Hot weather field trials of chemical protective suit; *Hugh D Crone*, Limitations on the effectiveness of chemical protection for the person, particularly that of heat stress; *C Richard Hall*, Possible developments in protective clothing; *Hermann Martens*, New aspects of decontamination; *Zlatko Binenfeld and Vladimir Vojvodic*, Medical aspects of chemical warfare; *Slawomir Rump*, Medical protection: present status and possible development; *Gad Bar-Sela*, The protection of civilians; *Benjamin Harris and Frank Shanty*, US chemical defence; *Kathleen C Bailey*, The need for increased protection against chemical weapons; *Mohamed El Zarka*, Antichemical protection and chemical weapons non proliferation; *Gao Fang*, To develop suitable chemical defence technology for developing countries, to facilitate the conclusion of the CW Convention; *Alexander T Lugachev*, Political and technical aspects of antichemical protection in the context of elaboration of the Convention on the Prohibition of Chemical Weapons; *Graham Cooper*, Article X of the Chemical Weapons Convention: Assistance and Protection against Chemical Weapons; *Martin M Kaplan*, A final comment.

HSPOP 2 is available from the Committee for National Security (see below), price \$12 (plus \$3.50 postage and handling). Payments may be made by cheque (in US\$) or by Visa/MasterCard.

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