

CHEMICAL WEAPONS CONVENTION BULLETIN

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CONCLUDING THE CHEMICAL WEAPONS CONVENTION

by Paul O'Sullivan

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Important progress was made during the 1991 session of the Conference on Disarmament on the issues which remain to be settled before a Chemical Weapons Convention can be concluded. That progress encompassed agreement on Article I defining the scope of the Convention's prohibitions; new concepts for verification of the chemical industry and for addressing challenge inspections were put on the table; and provisions for assistance to victims of a chemical weapons attack or those threatened with an attack were developed. Consideration of the Convention's provisions ensuring that nothing in it inhibited the free trade in legitimate chemicals was also advanced, as were proposals to confine trade in scheduled chemicals to States Parties; and the Ad Hoc Committee changed its mandate to specify a time-frame for finishing the Convention -- that is, it agreed to conclude these negotiations in 1992.

Despite these welcome and necessary advances, at the end of the 1991 session there was nevertheless a sense of some real obstacles being revealed. These relate to: industry verification, in particular whether to expand the scope of such verification under Article VI to include industry capable of producing, processing or consuming scheduled chemicals; procedures for challenge inspection under Article IX; the language of paragraph 6 of Article X dealing with provision of assistance, to which changes were proposed undermining its voluntary character; and proposed additions to Article XI on economic and trade development, calling in effect for the abolition of national export controls between States Parties.

Given the long time already devoted to these negotiations, what can be done in the period immediately ahead to achieve an effectively verifiable Convention acceptable to a broad range of countries? First, a greater involvement by capital-based officials might help inject a firmer concentration on the security benefits that this treaty will provide especially to Third World countries. It is in the Third World that chemical weapons have been used on each occasion since their initial use in World War I, and it is in situations of regional tension in the Third World where the temptation to use chemical weapons may be greatest. It follows that the enhancement of security by the removal of such a threat will be greatest in the Third World, although any use of chemical weapons would have negative security implications for many states. That is why Australia supports a multilateral Convention as the only effective long-term solution to the challenge posed by chemical weapons.

A second improvement would be to have a less formalistic structure in the negotiations. It is not at all obvious that the process of Working Groups which has been common in recent years has really worked effectively. Partly this has to do with the drain on resources that multiple Working Groups demand, especially for small delegations. Partly it has to do with a sense that "real negotiating" is

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awaiting the involvement of more senior officials than those participating in the Working Groups. In turn, this sense produces an atmosphere of game playing rather than carefully weighed and nuanced negotiation. The removal of the Working Group structure, with its politically-balanced representation, might also break down an institutionalized group mind-set which it is not useful to perpetuate. It is also the case that more private consultations via a system of "Friends of the Chair" would allow for compromises to emerge without having to be publicly viewed and without negotiators being seen as gaining or losing face. In particular, it may be time -- if the negotiations are to be concluded next year -- for the conference to select several key Friends of the Chair who should work on the principal remaining matters such as verification, assistance and universality, and structural questions related to the CWC organization.

Thirdly, it should be accepted in principle that a meeting of the Ad Hoc Committee at ministerial level be scheduled for early 1992. This would in itself impart a discipline and sense of urgency to the negotiators either to conclude the negotiations so that the Ministers could ratify the agreement at such a meeting or, if that were not possible, clearly delineate options on the outstanding issues so that Ministers could consider an overall package that might clinch the deal.

Also, it is time to encourage greater regional efforts to initiate a dialogue on the practical requirements that this Convention will impose. Such a dialogue has already been undertaken in Southeast Asia and the Pacific and in Latin America. There are proposals for similar efforts in Africa. Obvious areas where this approach might be taken further are the Middle East, the Sub-Continent and East Asia. A regional dialogue could help prepare for the Convention and help assuage false fears about the security intentions of key regional states. The efforts of non-governmental organizations such as the Quakers, who have been active in searching for a common ground to conduct such a dialogue in the Middle East, are to be applauded and heartily encouraged.

Finally, if we are to adhere to the schedule in the Committee's mandate, the time will shortly be upon us for a meeting of the prospective or acting heads of the national implementation authorities that are to be established under the CWC. Such a meeting will have an important role in standardizing implementation requirements so that each State Party could be confident that it would not be commercially penalized by the way it interpreted its obligations. It would also have an important function in educating those who had only recently turned their minds to the CWC requirements about how to implement their obligations under the Convention.

Such practical measures would be useful addenda to the efforts of the negotiators in Geneva. There is also a need to continue a dialogue with industry, not so much any longer on the content of the treaty, but on the sort of training and implementation activities which the Technical Secretariat will be asked to assume soon after the Convention comes into force. These supplementary measures and renewed efforts in Geneva may produce the combination of practical and political will that is needed if 1992 is indeed going to see the conclusion of the Chemical Weapons Convention. ■

The *Chemical Weapons Convention Bulletin* is edited and published quarterly by the Harvard-Sussex Program on CBW Armament and Arms Limitation. The goal is to provide information and analysis toward an effective multilateral treaty which will eliminate chemical weapons and help prevent the exploitation of biomedical technologies for hostile purposes.

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To Develop Suitable Chemical Defensive Technology for Developing Countries: To Facilitate Conclusion of the Chemical Weapons Convention

by Gao Fang

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Characteristics of chemical weapons. Chemical weapons have two characteristics that are contradictory: On the one hand, they are weapons of mass destruction, a means of massacre. Upon receiving the Nobel Prize in 1919 for his work on the fixation of atmospheric nitrogen, Fritz Haber, pioneer of chemical warfare, said: "In no future war will the military be able to ignore poison gas, it is a higher form of killing." More than a million people were killed or wounded by chemical weapons in World War I, the Italo-Ethiopian war, the Iraq-Iran war and other conflicts in which chemical weapons were used.

On the other hand, chemical weapons have intrinsic weaknesses. They are not all-weather weapons, but are strongly weather-dependent. Meteorological factors limit their effectiveness and can even make them useless. Moreover, people can be fully protected against chemical warfare agents by chemical defensive equipment. Even in World War I, gas masks played an important role in defense against chemical weapons. Rudolf Hanslian in his book *Der chemische Krieg* (1927) states that early in the war, when chemical attacks were against unprotected or poorly protected troops, the fatality rate was as high as 35 percent but that near the end of the war it had dropped to 2.5-6 percent. One of the causes of this steep decline was that both sides became equipped with gas masks. The same point may be made for modern conditions, as exemplified by the estimate of Stöhr in *SIPRI CBW Studies* No. 7 (1987) that an attack with the nerve agent sarin causing 70-80 percent casualties to personnel without masks would cause only about 2 percent casualties to personnel wearing masks. Against well-protected troops, therefore, chemical weapons will inflict only a very low percentage of casualties. My conclusion is that chemicals are weapons of mass destruction only when used on unprotected or poorly protected personnel. Against armies well prepared for chemical defense, chemical weapons are much less effective or even ineffective. It follows that military and civilian chemical defense is an important factor in deterring the use of chemical weapons.

Chemical defense for developing countries: a difficult problem. Thanks to developments in science and technology, many industrialized countries have developed chemical defensive equipment that makes it possible for soldiers and civilians to survive and continue to fight or work in a chemical environment. Modern gas masks can filter out all known chemical warfare agents in vapor or aerosol forms at field concentrations and the burden to the wearers is becoming less and less. Modern charcoal-containing permeable chemical protective clothing greatly increases the survivability of people facing percutaneous chemical threats. Gratifying progress has also been made in the technology of detection and warning. Some countries, such as Israel, Sweden and Switzerland, even have gas masks for every civilian, an important measure to deter chemical attack.

But the above stated situation is valid only for industrially developed countries. For developing countries, it is very difficult to achieve a high level of protection, owing to the following reasons: their lower level of scientific development prevents timely access to technical information; their less advanced industrial base limits development and manufacture of chemical defensive equipment; their lower educational level is a barrier to instruction in the proper use of chemical defensive equipment; and, most important, their economy cannot support the heavy financial burden of procuring adequate chemical defensive equipment for military personnel and civilians. Therefore, developing countries face a more dangerous threat from chemical weapons than do developed countries. It is not surprising that all the uses of chemical weapons after World War I were against developing countries.

What is the conclusion? I believe that the statement "Chemical weapons are the poor man's nuclear bomb" is wrong. The right statement is "Chemical weapons are the sword of Damocles hanging over the poor man's head."

China's technical approach. China faces the same problem in developing chemical defensive equipment as other developing countries. China's approach to solve this problem is practical and realistic and is in conformity with its situation.

During the war with Japan, China suffered greatly from CW, which killed or injured many people. The following is an incomplete survey provided in 1941 by the Chinese Gas Defense Department:

Year	No. of attacks	Casualties:	
		killed	wounded
1937	9	20	50
1938	105	293	2708
1939	455	634	12556
1940	259	71	6288
1941	231	930	5000
	1059	1948	26602

Cited in E.M. Spiers, *Chemical Warfare* (1986).

Newer Chinese statistics estimate the total killed and wounded by chemical weapons for the period 1937-45 at 80,000. So, it is not strange that China is deeply concerned to protect its soldiers and civilians from CW.

Even if the cost of a gas mask were as low as 10 dollars, providing masks for the 1.1 billion population of China would cost 11 billion dollars, equal to 1.5 times the entire annual military expenditure of China -- a completely unacceptable figure! So a Convention for complete destruction and total prohibition of chemical weapons conforms to the basic interests of China, as well as of all mankind.

At the same time, we have to develop low-cost, light-weight chemical defensive equipment that is technically sound, using available raw materials. Following these guidelines, we have developed a series of chemical defensive items and technologies for the Chinese Army including: inexpensive coal-based activated charcoal, costing about \$0.8/kg to produce; charcoal-containing cotton gauze filter material, made by a simple low-cost textile technology, and also charcoal-containing filtering board; light-weight, low-cost gas masks, such as the T-65 and T-69, weighing only about 600g, with a production cost of about \$10 each; charcoal-containing cotton flannel, and permeable chemical protective clothing made from it (It is lightweight, about 1.4 kg/suit, and has high mechanical strength and low production cost, about \$20/suit.); and duck cholinesterase, easily obtainable in China, which can be used to detect G- and V-agents with high sensitivity.

There is still a long way to go to develop chemical defensive technology suitable for China and other developing countries. Accordingly, there is keen interest and a definite need for international exchange of information and cooperation.

Implications of chemical defensive technology for the Chemical Weapons Convention. The achievement of an effective Chemical Weapons Convention depends on many factors, one of the most important of which is the level of chemical defensive technology. An effective Convention is urgently needed because CW is a weapon of mass destruction that has killed and wounded large numbers of people and is a threat to mankind, as further emphasized by recent disquieting developments.

But if effective chemical defensive equipment and training are generally available, the military value of chemical weapons will be greatly decreased and any attraction chemical weapons may have for military establishments will be greatly weakened. The inevitable result will be to facilitate the conclusion of an effective CW Convention. For this to occur, as industrialized countries provide themselves with high-tech chemical defensive equipment, we must also remember the importance of developing chemical defensive technology suited to the needs and capabilities of developing countries. ■

What follows is taken from the Sussex-Harvard rolling CBW chronology. The intervals covered in successive Bulletins have a one-month overlap in order to accommodate late-received information. The basic chronology, which is continuously updated, is fuller and provides complete citations of sources. For access to it, apply to Julian Perry Robinson at the Science Policy Research Unit, University of Sussex, Brighton, BN1 9RF, England.

2 May The Australian Ministry of Foreign Affairs and Trade announces that the director of its chemical and biological disarmament branch, Dr John Gee, is to head the Working Group on Chemical and Biological Weapons of the UN Special Commission mandated by the Kuwait-War ceasefire resolution [see 22 Apr]. Dr Gee is a career diplomat with a doctorate in chemistry from Oxford University. {Australian Embassy, Washington, *Australia News Release*, 2 May; Australian High Commission, London, Australian Overseas Information Service, release dated 3 May}

6 May The clandestine radio station *Voice of Rebellious Iraq* says that the Iraqi government is dispersing its CBW weapons to several locations, particularly in the north of the country. {Voice of Rebellious Iraq 6 May in FBIS-NES 7 May}

7 May At the United Nations in New York, the Working Group on Chemical and Biological Weapons of the UN Special Commission [see 2 May] begins its work. Besides its Coordinator, Dr John Gee of Australia, the Group comprises Dr Paal Aas of Norway, Lt-Gen (ret) Ken Adachi of Japan, Professor Bryan Barrass of the UK, Professor Helmut Honig of Austria, Dr A J J Ooms of The Netherlands and Dr Miroslav Splino of Czechoslovakia, assisted by Dr Johan Santesson for the World Health Organization. The Group is joined by members of the Future Compliance Working Group, including Ron Cleminson of Canada, Dr Marjatta Rautio of Finland and its Coordinator, Peter von Butler of Germany, assisted by Lt-Col Jim Knapp of Canada. {S/22614}

8 May In the Russian Federation, at a meeting of the Supreme Soviet of the Mari Autonomous Republic, opposition is expressed to location of chemdemil facilities on the territory of the 13th District. {Moscow domestic service 8 May in BBC-SWB 10 May}

8 May In the UK House of Commons, the Defence Committee is told by Lt-General Sir Peter de la Billière, joint commander of British forces during the Kuwait War, that to his knowledge no Iraqi CW weapons had been recovered, apparently because they had not in fact been deployed to frontline Iraqi units [see 26 Feb and 6 Mar]. {FT 9 May}

8 May In the US Congress, the House Armed Services Committee completes its markup of the 1992 defense authorization bill. Citing the GAO study it had requested on the state of the Army's chemical defense program [see 16 Apr], it adds \$50 million to enable the Army to purchase Marine protective overgarments and \$15 million for the Marine Corps to expand its defensive chemical equipment program {House Armed Services Committee news release, 8 May}. This additional authorization of \$65 million is in Operations & Maintenance funds.

9 May In Brussels, unidentified NATO sources reportedly say that the United States is pressing for retention of chemical weapons in the Alliance's new post-Cold-War strategy, despite the opposition of many NATO member states. {Reuter as in CN 10 May}

10 May The US Army Armament, Munitions and Chemical Command awards a \$16.1 million contract to EAI Corporation of Abingdon, Maryland for a 54-month program to provide specialized R&D

support to the CRDEC in support of US CW arms-control initiatives {DN 27 May}. EAI also announces plans to open a Chemical and Biological Warfare Arms Control Institute at its Abingdon headquarters {ASA Newsletter 6 Jun}.

13 May President Bush announces major changes in US policy on chemical weapons, as follows:

"The Gulf war has once again raised the specter of chemical weapons and demonstrated that unscrupulous regimes can and will threaten innocent populations with these weapons of terror so long as we permit them to exist. These stark events renew and reinforce my conviction, shared by responsible leaders around the world, that chemical weapons must be banned -- everywhere in the world.

"The world's best hope for this goal is the Chemical Weapons Convention now being negotiated by the Conference on Disarmament in Geneva. The United States is committed to the early, successful completion of this Convention and I am today announcing a number of steps we will take to accelerate the negotiations and achieve an effective chemical weapons ban as soon as possible. I hope this initiative also will spur other nations to commit themselves equally to this critical objective.

"I have instructed the United States negotiating team in Geneva to implement my decisions at the next session which begins May 14. To demonstrate the United States commitment to banning chemical weapons, we are formally forswearing the use of chemical weapons for any reason, including retaliation, against any state, effective when the convention enters into force, and will propose that all states follow suit. Further, the United States unconditionally commits itself to the destruction of all our stocks of chemical weapons within ten years of entry into force and will propose that all other states do likewise. We will offer technical assistance to others to do this efficiently and safely.

"In addition, we will call for setting a target date to conclude the Convention and recommend the Conference stay in continuous session if necessary to meet the target. The United States also will propose new and effective verification measures for inspecting sites suspected of producing or storing chemical weapons. To provide tangible benefits for those states that join the Convention and significant penalties for those that fail to support it, the United States will propose the Convention require parties to refuse to trade in chemical weapon-related materials with states that do not join in the Convention. The United States reaffirms that we will impose all appropriate sanctions in response to violations of the Convention, especially the use of chemical weapons.

"These steps can move the world significantly closer to the goal of a world free of chemical weapons. I call upon all other nations to join us in the serious and cooperative pursuit of this important goal."

A *Fact Sheet* issued by the White House to accompany this statement, specifies the "target date" as "completion of the CWC within 12 months." It also says that the United States "will formally declare its intention to become an original party to the CWC." On the offer of chemdemil technical assistance, it says: "We will:

--Create a Task Force comprised of US Government and private industry representatives to develop proposals on how the US can advise and assist states in CW [here denoting "chemical weapons"] destruction.

--Provide technical destruction assistance (e.g., visits to US de-

struction facilities, blueprints, and technical advice) to states parties that have CW located on their territory.

--Propose the creation of a CD Working Group on CW destruction and offer to provide US experts to it."

On the verification measures for suspect sites, it says: "We will call on the CD to adopt our position for challenge inspection of such sites." {The White House, Office of the Press Secretary, *Statement by the President on Chemical Weapons Initiative and Fact Sheet*. (Both texts are reprinted in CD/1077 of 23 May.)}

15 May The US General Accounting Office issues an unclassified version of the report on *Chemical Weapons: Physical Security for the US Chemical Stockpile*, which it had issued on 14 March. The report notes that while the nine US chemical-weapon storage sites are "potentially vulnerable to a terrorist attack, no chemical sabotage or diversion attempts have been made at the storage sites in the past 5 years." Overall, the GAO finds that the storage sites comply with the Army's physical security standards. {GAO/NSIAD-91-200}

15 May The *Korea Herald* reports that a total of 122,793 tear-gas projectiles have so far this year been fired during civil disturbances in South Korea, 34 percent up on last year [see also 3 Jan]. {*Korea Herald* 15 May in TL 18 May}

16 May In Geneva the CD reconvenes for its second session of the year.

16 May At the CD in Geneva, US Ambassador Stephen Ledogar reads a message from President Bush containing the substance of his recent policy statement on chemical weapons [see 13 May]. The ambassador goes on to present the more detailed position which the White House had outlined at the time of the statement, including the dropping of both the 2-percent proposal and the insistence on retaining a right of retaliation with chemical weapons. He urges others "to show flexibility in their positions and to make the same commitment toward accomplishing our common objectives." {CD/PV.591}

16 May Iraq submits to the UN what it later describes as a "comprehensive list" amplifying the declaration of its CW-related items which it had submitted on 18 April [q.v.]. {INA 3 Aug in FBIS-NES 5 Aug}

17 May In the CD Ad Hoc Committee, a cleaned-up version of the Schedules of Chemicals is distributed, the result of extensive consultations but still provisional, pending not least the outcome of the continuing deliberations in Group B on the control regime to be applied to the civil chemical industry [see 27 Mar]. Changes include the express exemptions of the pesticide Fonofos and certain

dialkylaminoethanols from Schedule 2A and their inclusion in Schedule 3, and the shift of Agent BZ from Schedule 1 to Schedule 2B; and three nitrogen-mustard precursors are added to Schedule 3.

17 May The UN Secretary General submits to the Security Council for its approval the plan required under Resolution 687 for inspecting Iraqi CW items and facilities and for taking possession of the weapons. {S/22614}

The submission states that the Special Commission is establishing a Field Operations Office in Bahrain and a Support Office in Baghdad. The submission reports a "continued exchange of communications" between the Special Commission and the Iraqi government for the purposes of clarifying and supplementing the information declared by Iraq about its weapons [see 18 Apr and 16 May]. Newly acquired information is said to have "raised considerably" the total tonnage of chemicals above that initially declared by Iraq {ASA Newsletter 6 Jun}.

As to biological weapons, the Secretary General reports that the Special Commission has asked Iraq, now that it has joined the BWC, to submit a declaration of data about BW-pertinent matters in accordance with the agreement reached at the meeting of experts established by the 2nd BWC Review Conference. {S/22614}

Iraq reportedly accepts the UN Secretary General's plan, thereby in effect guaranteeing the Commission's inspectors immediate access to any site they may choose. {NYT 18 May}

20 May The UN Special Commission decides to carry out an initial exploratory investigation of the Muthanna State Establishment in Iraq, the largest CW site referred to in the declaration of 18 April [q.v.], located near Samarra. The inspection, to be performed by some 18 inspectors plus support staff, is scheduled for 10-14 June. The Deputy Executive Chairman of the Special Commission, Robert Galucci, reportedly describes the projected Samarra inspection as a "scouting mission." {ASA Newsletter 6 Jun}

21 May The US Army Program Manager for Chemical Demilitarization publishes its Final Environmental Impact Statement on the disposal of chemical agents and munitions stored at Anniston Army Depot, Alabama [see 14 Nov 90].

21-23 May The **Australia Group** meets in Paris, subsequently issuing its first-ever press communiqué, a brief one {Australia, Ministry of Foreign Affairs and Trade, news release, 24 May}. Members of the US delegation -- its leader, Deputy Assistant Secretary of State Elizabeth G Verville, and Acting Under Secretary of Commerce Joan M McEntee -- later speak to reporters about the meeting, saying that agreement was reached that all 20 participating governments will, by the end of the year, subject any of the 50 precursor chemicals on the Australia-Group list which they do not already control to export-

GLOSSARY OF ABBREVIATIONS FOR NEWS CHRONOLOGY

ACR	<i>Arms Control Reporter</i>	DD	<i>Defense Daily</i>	IHT	<i>International Herald Tribune</i>
AD	<i>Aerospace Daily</i>	DFAW	<i>Defense & Foreign Affairs Weekly</i>	Ind	<i>Independent (London)</i>
AN	<i>Atlantic News</i>	DN	<i>Defense News</i>	ITP	<i>Inside the Pentagon</i>
BBC-SWB	<i>BBC-Summary of World Broadcasts</i>	DPA	<i>Deutsche Presse Agentur</i>	Izv	<i>Izvestiya</i>
CBW	<i>Chemical/biological warfare</i>	DTel	<i>Daily Telegraph (London)</i>	JDW	<i>Jane's Defence Weekly</i>
CD	<i>Conference on Disarmament</i>	DW	<i>Defense Week</i>	MT	<i>Military Technology</i>
CD/	<i>CD document</i>	FBIS	<i>Foreign Broadcast Information Service (Washington)</i>	NYT	<i>New York Times</i>
C&EN	<i>Chemical & Engineering News</i>	FedR	<i>Federal Register (Washington)</i>	Obs	<i>Observer (London)</i>
CN	<i>Current News Early Bird</i>	FT	<i>Financial Times (London)</i>	S/	<i>UN Security Council document</i>
CQ	<i>Congressional Quarterly (Weekly Report)</i>	Guar	<i>Guardian (London)</i>	TL	<i>Times (London)</i>
CR	<i>Congressional Record</i>	HansC	<i>Hansard (Commons)</i>	STel	<i>Sunday Telegraph (London)</i>
CW	<i>Chemical warfare</i>	HansL	<i>Hansard (Lords)</i>	WP	<i>Washington Post</i>
				WT	<i>Washington Times</i>
				WSJ	<i>Wall Street Journal</i>

licensing requirements, not just those precursors on the core list [see 11-13 Dec 90]. They reportedly say, too, that a similar agreement will be sought at the next meeting of the Group, in December, aimed at preventing the spread of biological weapons {WP 31 May}.

President Bush subsequently reports to the US Congress that every Australia-Group member at the meeting, besides agreeing to control all 50 precursors by the time of the next meeting, in December, "also agreed in principle to control the export of dual-use chemical weapons-related equipment." He reports, further, that the US Government "is seeking greater harmonization of national export control laws, particularly in the areas of chemical and biological weapons-related equipment, including whole chemical plants, and curbs on citizen proliferation activities and end-user controls." {CR 21 Jun pp. S8456-7}

22 May In the United States, the outgoing Director of Central Intelligence, Judge Webster, says in a public address: "Twenty years ago, only five countries possessed chemical weapons. By the year 2000, as many as two dozen countries could have chemical and/or biological warfare capabilities" [see also 7 Mar]. {Prepared text}

22 May In Iraq, a team of IAEA inspectors conclude a 5-week visit, having located all of the highly enriched uranium believed to be in Iraq's possession, so unidentified US officials are reported as saying. UN Special Commission Chairman Rolf Ekéus tells reporters that the next round of UN inspections is to be launched from newly established headquarters in Bahrain in about two weeks time directed at chemical weapons [see 20 May]. {WP 23 May}

22 May In the US Congress, the Senate Foreign Relations Committee receives administration testimony on the President's new chemical-weapons initiative [see 13 May]. The Director of the US Arms Control & Disarmament Agency, Ronald Lehman, speaks also of the delay in submitting the US-USSR bilateral destruction agreement of June 1990 for Congressional approval, explaining that this is because the USSR is having difficulty in finalizing its chemdemil plan [see 4 Apr] {prepared statement}. CD Ambassador Stephen Ledogar indicates that Phase II of the US-Soviet bilateral verification experiment agreed in the September 1989 Wyoming Memorandum of Understanding may commence "as soon as the very beginning of 1992," signifying that multilateral agreement on the CWC would then be expected within a few months. He says that the next round of US-Soviet CW bilaterals is being delayed pending action by the Supreme Soviet on the chemdemil program, adding that "the Soviets unfortunately have been slow to respond to our offers of cooperation" {prepared statement}.

22-24 May Germany hosts a multinational trial inspection at a military airbase at Pfordersfeld near Bad Kreuznach, the participants in the inspection team coming from Argentina, Egypt, Iran, Pakistan and the United Kingdom. {ADN 21 May in FBIS-WEU 23 May}

23 May Peru declares at the CD its intention to become an original signatory of the Chemical Weapons Convention. Its representative tells the conference, further, that the foreign ministry "is already taking steps to establish, at the appropriate time, the Na-

tional Authority in conformity with Article VII" {CD/PV.592}. And he introduces a working paper on challenge inspection, proposing two clearly differentiated stages for such inspections {CD/1075}.

23 May The clandestine radio station *Voice of the National Army of Democratic Kampuchea* states that the recent deaths of 77 people and serious illness of more than 400 others in Kompong Thom province which the Cambodian government had attributed to an outbreak of cholera were in fact the consequence of a deliberate poisoning of water supplies by the "Vietnamese enemy aggressors" [see also 22-26 Feb]. {Voice of the National Army of Democratic Kampuchea broadcast 23 May in FBIS-EAS 24 May}

27 May From the Solomon Islands, a US Navy ship sets sail with 109 old 155mm mustard-gas shells bound for the chemdemil facilities on Johnston Atoll. The shells [see 31 Jul 90] had been found on Mbanika Island, where they had resisted local chemdemil efforts in 1988, and are part of the 12,000 US mustard-gas rounds sent out to the South Pacific during World War 2, many of which are still missing. {WSJ 28 May; prepared testimony of Susan Livingstone before a Senate Armed Services Subcommittee, 13 Jun}

29 May At the United Nations in New York, the five permanent members of the Security Council are considering a US-British draft resolution that would require Iraq to pay for the destruction (under Resolution 687) of its own weapons {CN 30 May}. A figure of \$50 million is subsequently cited as a possible initial Iraqi contribution to the costs {Ind 23 Jul}.

29 May President Bush, addressing the US Air Force Academy in Colorado Springs, puts forward his long-awaited Middle East arms-control initiative. It has five main elements: on *supplier restraint*, calling on "the five major suppliers of conventional arms [Britain, China, France, the Soviet Union and the USA] to meet at senior levels in the near future to discuss the establishment of guidelines for restraints on destabilizing transfers of conventional arms, as well as weapons of mass destruction and associated technologies"; on *missiles*, proposing "a freeze on the acquisition, production, and testing of surface-to-surface missiles by states in the region with a view to the ultimate elimination of such missiles from their arsenals"; on *nuclear weapons*, supporting "the eventual creation of a regional nuclear weapon-free zone" and calling on regional states to "implement a verifiable ban on the production and acquisition of weapons-usable nuclear material," to join the NPT, and to place all nuclear facilities under IAEA safeguards; on *chemical weapons*, calling for regional states "to commit to becoming original parties" to the CWC and "to institute confidence-building measures now by engaging in presignature implementation of appropriate CWC provisions"; and on *biological weapons*, calling for strengthening the "1972 Biological Weapons Convention through full implementation of existing BWC provisions and an improved mechanism for information exchange," and urging regional states to "adopt biological weapons confidence-building measures."

Supplier-restraint guidelines are to be discussed at a conference of the five powers soon to be hosted by France. Other suppliers will then be brought into the discussions, a process that could be initiated, the President suggests, at the London summit

of the Group of Seven, in July. {Office of the Press Secretary, *Fact Sheet on Middle East Arms Control Initiative*, 29 May}

30 May In the US House of Representatives, a Budget Committee task force receives testimony supportive of the proposal to establish a link between US aid to foreign governments and the willingness of those governments to support and eventually join the Chemical Weapons Convention [see also 1 Apr, Tokyo] {Prepared statements of James F Leonard and Elisa D Harris before the Defense, Foreign Policy and Space Task Force}. The Administration declines to testify {*Foreign Aid Funding and Chemical Weapons*, see bibliography for full citation}.

30 May Angola is admitted as a participating non-member of the CD, the 35th such participant in the 1991 session [see 31 Jan]. {CD/PV.593; CD/INF.26}

31 May In Israel, governmental officials comment to US Defense Secretary Dick Cheney on President Bush's recent Middle East arms control initiative [see 29 May], reportedly saying that any agreement would have to include at least 17 Muslim nations regarded as potential threats to Israel -- nations stretching from Morocco to Pakistan. {IHT 1-2 Jun, DN 3 Jun}

3 June NATO Secretary General Manfred Wörner, addressing the 44th World Congress of Newspaper Publishers in Athens, speaks of the recent arms-control initiatives of President Bush and says that a new initiative by industrialized countries aimed at slowing down the proliferation of chemical and other arms must not be seen as an attempt by the North to dominate the South. Rapid progress can be made, he says, by setting up an ad hoc group which would be open to all producers and suppliers, wherever located in the world, to produce guidelines and realistic methods of controlling proliferation; flexibility and a gradualistic approach would be indispensable. He says, further, that NATO has a vital interest in the success of such an enterprise, and will do all it can to help. {AN 5 Jun, DN 17 Jun}

3 June President Mitterrand announces that "France has decided in principle to sign" the nuclear Non-Proliferation Treaty. This announcement is part of a presidential Plan for Arms Control and Disarmament {CD/1079} which envisages initiatives of three types: by category of weapon, by region, and at global level. On chemical weapons, the plan reaffirms French support for a session of the CD CW committee at ministerial level [see 16 Aug 90], proposing that it should be convened "to complete the negotiations before the year's end"; and "calls on all States to become parties to the Convention from the outset." On biological weapons, the plan states that, at the Biological Weapons Convention Review Conference in September, France will propose the addition of a protocol on verification. {DTel & WP 4 Jun}

4 June From Bangkok, attributing unidentified Thai Interior Ministry and military intelligence sources, UPI reports that Thai authorities are investigating reports that, just across the border with Laos during the previous week, Lao forces had been using chemical weapons, described as "yellow rain," against hill-tribe rebels {*The Nation* (Bangkok) 7 Jun in FBIS-EAS 7 Jun}. Vientiane describes the report as "completely groundless" {Vitthayou Hengsat radio broadcasts 8 Jun and 6 Jul in FBIS-EAS 10 Jun and 8 Jul}.

5 June In Libya, after talks between Colonel Muammar Gaddafi and visiting Italian Prime Minister Giulio Andreotti, a joint communiqué is issued in which the two countries "reaffirmed the firmest possible condemnation of the manufacture, storage and use of chemical and bacteriological weapons." {FT 7 Jun}

5 June In Germany, an unidentified "top intelligence official" says it is believed that there are chemical weapons in the Soviet military base at Altengrabow, 50 miles southwest of Berlin, and elsewhere in eastern Germany. Much of the stockpile is thought to consist of captured German supplies stored since World War II in bunkers without adequate safety checks. He adds: "We believe the Russians feel unable to move the chemical weapons, firstly because they have always denied that they had any in Europe and secondly because they do not have secure transport facilities." {DTel 6 Jun}

Federal Defense Minister Gerhard Stoltenberg tells reporters two weeks later, however, that there is "absolutely no evidence" that chemical weapons are stored on the former territory of the GDR. {ADN 19 Jun in FBIS-WEU 20 Jun; WT 8 Jul}

5 June The British government states in Parliament: "We are pressing for greater standardization of controls among members of the Australia Group over chemical weapon precursor chemicals, biological weapon related organisms and related dual purpose equipment. That group should be expanded to cover a wider range of countries, including, we hope, eventually the Soviet Union." {HansL 5 Jun}

6 June In Pakistan, Prime Minister Nawaz Sharif, addressing the National Defense College in Rawalpindi, states that Pakistan is "willing to enter into a bilateral arrangement with India or a regional regime for ensuring that South Asia remains free of all weapons of mass destruction." He proposes that the United States, the Soviet Union and China consult and meet with India and Pakistan "to discuss and resolve the issue of nuclear proliferation in South Asia." He announces that he is sending a high-level delegation to the United States. {CD/1091}

6 June In Bulgaria, Interior Minister Khristo Danov confirms what had long been alleged, that Bulgarian secret police were involved in the murder in London of Georgi Markov, killed by a poison pellet from an umbrella in 1978 {DTel 7 Jun}. His statement coincides with the arrival in Sofia of two British detectives from Scotland Yard's antiterrorist branch sent to examine newly released evidence {TL 7 Jun}. Presidential spokesman Valentin Stoyanov had earlier said it was probable that former General Secretary Todor Zhivkov would now be charged with conspiracy to murder {TL 2 Jun}.

6 June Finland and the Netherlands submit a joint paper to the CD Ad Hoc Committee on Chemical Weapons recommending a decentralized structure for the laboratory support that is to be provided for the CWC Technical Secretariat. The paper identifies a variety of analytical and related tasks for which that laboratory support will be needed, including analysis of samples taken by inspectors, compilation and updating of the analytical chemical data-base, synthesis of reference chemicals, development and testing of verification instruments, training of inspectors in the use of those instruments, supervision of sample handling and transportation, and quality-control of participating Accredited Labora-

tories. The conclusion is that, provided a reliable quality-assurance system can be incorporated, it would be more cost-effective to entrust most of these tasks to a network of Accredited Laboratories than to depend entirely on a Laboratory of the Technical Secretariat. The role of that central laboratory within the recommended structure would be a stimulating and coordinating one. {CD/CW/WP.342}

6 June Britain submits to the CD a report on practice challenge inspections conducted during January and April in its civil chemical industry which had made use of managed-access techniques to protect commercial confidentiality {CD/1080}. The report is introduced by Minister of State Douglas Hogg who states that the conclusions drawn from the trial "have reinforced our view that a system of challenge inspection for both civil and military sites, intrusive enough to represent a real deterrent to evasion, is practical and achievable." He reiterates the finding, presented a year previously [see 12 Jul 90], from practice challenge inspections at sensitive government facilities in the UK: "Our main conclusion, one that we commend to all parties, was that there is no site so sensitive that we could not allow some form of access within it." He adds: "Our conclusion remains that effective verification is crucial for the convention and that challenge inspection is the key to effective verification."

As to other areas of verification, he welcomes "the new proposals put forward by Sweden [see 14 Feb] for an integrated approach to the routine verification of the chemical industry." {CD/PV.594}

6 June Norway announces at the CD that, within the framework of its research program on the verification of alleged use of CW weapons, it has decided to invite "scientists and scholars from developing countries" for training in verification methods. Further, Foreign-Affairs State-Secretary Helga Hernes says that the tenth in the annual series of publications from the research program {CD/1084} will shortly be distributed to CD delegations {CD/PV.594}.

6 June Japanese Foreign Minister Taro Nakayama, addressing the CD in Geneva, proposes that the projected ministerial-level meeting of the CD [see 16 and 21 Aug 90 and 19 Feb] be preceded by a preparatory "meeting in Geneva at the level of high officials from nations' capitals," possibly before the end of 1991. {CD/PV.594}

7 June Indian Foreign Secretary Muchkand Dubey reportedly says in an interview following the recent Pakistani proposal [see 6 Jun] that, while in managing its nuclear program India must take into account China, it would be anxious to enter talks to reach a verifiable agreement on a regional chemical-weapons ban. He also speaks of India being alarmed by recent reports that Pakistan is attempting to develop a chemical-weapons capability. {WP 8 Jun}

7 June In Germany the Bundesrat rejects the proposed new export-control legislation as revised by the Bundestag/Bundesrat mediating committee [see 22 Apr], the majority opposing, specifically, the unprecedented authority it would provide for invading communications privacy, even though the telephone-tapping etc. would be in the interests of counterproliferation. {*Süddeutsche Zeitung* 7 Jun in FBIS-WEU 10 Jun; WP 8 Jun}

7 June The Organization of American States, at a meeting in Santiago of its General Assembly, resolves to support the elimination "of every form of proliferation of weapons of mass destruction." Further, it agrees to seek an American regional ban "on the development, production, storage, and dissemination of chemical and biological weapons." {EFE 8 Jun in FBIS-LAT 10 Jun}

9 June In Iraq, 20 inspectors from a 24-man team of UN Special Commission experts, headed by Dr Peter Dunn of Australia with Lt-Col Jim Knapp of Canada as his deputy, arrive for the scouting inspection of the declared CW facilities near Samarra [see 20 May], thus initiating work on the elimination of Iraqi chemical weapons mandated by Security Council Resolution 687 {DTel & FT 10 Jun; UN press release, 24 Jun}. Other members of the team include Johan Santesson of Sweden and Amir Saghafinia of Iran, the latter overseeing medical operations from the UN headquarters in Bahrain {ASA Newsletter 6 Jun}.

9 June Iraq conveys to the UN its rejection of liability for the costs being incurred by the UN Special Commission in destroying its CW weapons under Security Council Resolution 687 [see 29 May]. However, the Iraqi Government tells the UN that it is ready "by its own efforts to destroy or render harmless the said weapons," adding that it possesses the requisite expertise and facilities. {S/22682}

The Deputy Executive Chairman of the Special Commission, Robert Galucci, is quoted as saying that the Iraqi proposal could be pursued if the destruction could take place under proper supervision {FT 12 Jun; ACR 7-91 p. 704.E-2.38}. He says, too: "The weapons are not going to be moved any great distance. ... We plan on destruction certainly in the region and most likely in Iraq" {*Bulletin of the Atomic Scientists* Sep 91}.

11 June In the United States, Veterans Affairs Secretary Edward J Derwinski announces that "because of the confidential nature of some mustard gas testing during World War II, we are giving the benefit of the doubt to those veterans who were involved in the tests." Previously the US government had been resisting claims for disability compensation from such veterans. As many as 60,000 US servicemen may have been exposed to CW agents during wartime trials. A CBS *60 Minutes* television documentary on the subject has not yet been screened {WP 12 Jun}, but is shortly afterwards on 16 June.

13 June In Iraq, only 60 percent of the country's CBW capability was damaged during the Kuwait war, according to press reports of a new US intelligence assessment. The damage had been done only at those facilities known before the war [see also 30 Jan, 11 Feb and 26 Feb]. {FT 13 Jun}

13 June In Moscow, *Komsomolskaya Pravda* reports accounts of past USSR chemdemil activities in which CW munitions were dumped into the White Sea during the 1950s and into the Barents Sea during 1960-61. {*Komsomolskaya Pravda* 13 Jun in FBIS-SOV 14 Jun}

13 June New Zealand Disarmament and Arms Control Minister Douglas Graham, addressing the CD in Geneva, cautions against anything like the "present inequitable IAEA funding system" for apportioning the costs of the CWC. {CD/PV.595}

13 June Austria proposes at the CD that "the existing special unit within [the World Health Organization] dealing with chemical weapons and biological-weapons-related issues" should be strengthened so as to enable the unit to assume a larger role in the implementation of confidence-building measures under the Biological Weapons Convention following the forthcoming Third Review Conference.

Austria also proposes a special meeting of states parties to the 1925 Geneva Protocol for the purpose of adopting a solemn declaration endorsing the withdrawal of all reservations to the Protocol as soon as possible, but not later than at the time of entry into force of the CWC. {CD/PV.595}

13 June Bulgaria informs the CD that a proposal has been tabled in its Council of Ministers for setting up a national commission to prepare for accession to the CWC, a commission which may later become the country's National Authority under Article VII of the Convention. {CD/PV.595}

13 June In Geneva, the CD accepts the recommendation of its Ad Hoc Committee on Chemical Weapons that, "with the view, as a matter of high priority, to intensifying ongoing negotiations" [see 13 May] the committee should hold "an additional regular session of limited duration" during 8-19 July {CD/1083}. In addition, an "informal understanding" is developing that there should be further intersessional work at least during 30 September through 11 October, 18 November through 20 December, and 6-18 January. Holding up formal CD endorsement of this understanding is disagreement on whether the CWC work should also continue during the periods of the Third BWC Review Conference and the First Committee meetings of the next UN General Assembly session {CD/PV.596}.

13 June Ireland is once again admitted as a participating non-member of the CD, the 36th such participant in the 1991 session [see 30 May]. {CD/PV.595}

13 June In the US Senate, the Defense Department gives testimony before an Armed Services subcommittee on the President's CW arms-control initiative, including the proposed renunciation of any US use of chemical weapons once the CWC is in force [see 13 May]: "We have assessed that the military significance of CW is diminished in an era in which targets can be neutralized conventionally with high accuracy and without placing restrictions on our own forces as a result of weapons employment. Furthermore, the deterrent value of the threat of retaliation-in-kind with CW must be considered in light of other factors, especially relative to the deterrent values of CW defense preparedness and overwhelming conventional resources, as we saw in the Gulf War." {Prepared statement of Deputy Assistant Secretary of Defense William B Inglee before the Strategic Forces and Nuclear Deterrence Subcommittee, Senate Armed Services Committee}

14 June In Iraq, the UN Special Commission concludes its initial exploratory inspection of the Muthanna State Establishment [see 9 Jun]. Some of the findings are summarized in a subsequent UN press release. {UN press release, 24 Jun}

The establishment, also known as the State Enterprise for Pesticide Production (SEPP), is a large complex of some 170

km² in area, the major facilities occupying about 25 km². "Conditions in many areas of the site are hazardous in the extreme. Most major structures on the site have either been totally destroyed or severely damaged as a result of the bombing during the hostilities: few buildings have escaped unscathed. While much unexploded ordnance has been removed, some still remains on the site. The site also contains leaking chemical munitions and the presence of chemical agent was detected in some areas and structures...."

"The team verified the presence on the site of mustard gas and organophosphorus nerve agents both as bulk agent and in the form of munitions. It was informed by the Iraqi authorities that the nerve agents were of the types GB and GF. [This is subsequently confirmed by analysis in Britain of a sample taken by the team. {STel 23 Jun, HansC 24 Jul}] The team also clarified with the Iraqi authorities their understanding of the term 'binary sarin' as used in their declaration to the Secretary General. In Iraqi terminology, the term sarin covers all G-type nerve agents based on esters, both single and mixed, and in this context 'binary sarin' is therefore a chemical munition containing both GB and GF.

"The team found evidence for the presence on the site of impure tabun (agent GA), whose use in the Iran-Iraq war had been verified by the United Nations investigations of 1984, 1985 and 1987. It was informed that production of GA at the site had ceased in 1986.

"The team was informed that the site had been used for the production of herbicides known as Propanil [N-(3,4-dichlorophenyl)propanamide] and Dalapon [2,2-dichloropropanoic acid].

"The team was also informed that research had been carried out at the Muthanna State Establishment on the nerve agents soman (agent GD) and VX, but that no large-scale production of these agents had been undertaken. It saw nothing on this occasion which was inconsistent with that statement, but concluded that two undamaged and sophisticated pilot plants found on the site would require further investigation.

"The team also verified the presence on site of a number of precursor chemicals, mainly acquired from abroad. Some of these were present in large quantities. It also found that the site contained equipment obtained from a variety of sources.

"During the inspection, the Iraqi authorities sought permission to remove certain items of equipment from the site for use in a water purification plant at Fallujah and for the formulation of insecticides. This request was granted by the Executive Chairman, subject to certain strict control arrangements being observed by the Iraqi authorities....

"...The inspection team found no indication that Iraq was deliberately trying to mislead the Commission; indeed the attitude of the Iraqi authorities throughout was cooperative.

"The team also held initial informal discussions with the Iraqi authorities on the Iraqi offer of 9 June [q.v.] to carry out the process of destruction. The team found that the site would be suitable for the destruction of Iraq's chemical weapons capabilities.

"The next steps will be a full inspection of the site and further discussions with the Iraqi authorities on the destruction process. Evaluation of the information collected during the initial exploratory inspection has commenced and detailed planning for the full inspection will commence in the very near future. Because of the size of the site and the extent of the facilities as well as the hazards involved, the full inspection could well be a lengthy process."

An executive summary of the UN inspection report itself, by team leader Peter Dunn, is later leaked to the press and reportedly includes the following additional information: (a) The inspectors were informed that the Muthanna facility could produce 2.5 tons per day of sarin nerve gas and 5 tons per day of mustard gas. (b) The 8 munition storage bunkers were kept at 18 C° in order to reduce agent deterioration, the expectation being that the munitions would be used within one week of removal from the bunkers. (c) Precursors found on site in bulk quantity included thionyl chloride and dimethylphosphoramidic dichloride. {Ind 4 Aug}

Further, the UN inspection report is later said to have identified by name foreign companies involved with Iraqi CW weapons, "dozens" of companies, according to one media report {Ind 27 Jul}, from a total of 13 countries, according to another {DPA 6 Aug in FBIS-WEU 7 Aug}, the countries including Austria, France, Germany, India, Switzerland and the United States {Ind 27 Jul}. Detailed information is being withheld from public disclosure by the UN Special Commission, but is being provided to governments that ask for it {DPA 6 Aug in FBIS-WEU 7 Aug}.

An unidentified "senior member of the team" is reported to have told diplomats in New York that the Muthanna complex had been built largely with German technology at an estimated cost of \$1000 million. {Ind 26 Jun}

15-16 June The Pugwash CW Study Group convenes a private meeting of technical experts to evaluate experiences from National Trial Inspections. There are 28 participants from 19 countries, most of them having been directly involved in their own countries' NTIs. A report from the meeting is distributed to CD delegations. The report lays stress on the need for a verification system as complex as that projected for the CWC to be adaptable to its own experience, meaning that the treaty itself should not lock the system into a rigid structure but should instead allow the Preparatory Commission, and even the eventual CWC Technical Secretariat, freedom to refine and amend the system. The report records the participants' support for the current approach of constructing the verification system from both routine and mandatory-challenge inspection regimes, noting, however, that, as regards routine inspection, there was much support for "a shift from systematic Schedule 2 type verification to nonproduction verification reaching well beyond the current Schedule 2." {*Pugwash Newsletter* July 91}

16 June In China, a Japanese-Government team of experts is scheduled to arrive for a week-long visit to determine whether old chemical weapons found buried in Jilin and other northeastern provinces are, as Chinese authorities had stated, remnants from the former Japanese Imperial Army. It had earlier been reported, with attribution to "informed sources" in Tokyo, that, if the weapons are indeed abandoned Japanese stocks, the Japanese Government plans to send another mission to dispose of them. {*Jiji Press* (from Tokyo) 5 Jun and (from Beijing) 21 Feb}

The Chinese Government states that the discussions will also be considering biological weapons.

16-17 June In Cambodia, Vietnamese aircraft disseminate "chemical poison" killing more than 20 people according to the clandestine radio station *Voice of the National Army of Democratic Kampuchea* [see also 23 May]. {*Voice of the National Army of Kampuchea* broadcast 21 Jun in FBIS-EAS 24 Jun}

17 June In Moscow, a senior official of the USSR Ministry of Internal Affairs tells *Komsomolskaya Pravda* that legislation is being drafted to allow the sale of self-defense weapons, including "devices with a tear-producing, irritant or painful percussive effect," to anyone over 16 years of age who can obtain a permit. {*Komsomolskaya Pravda* 18 Jun in FBIS-SOV 24 Jun; Interfax 14 Jun in FBIS-SOV 18 Jun}

17 June The UN Security Council approves the plan for the disarmament of Iraq submitted by the Secretary General on 17 May [q.v.] and decides that "the Government of Iraq shall be liable for the full costs of carrying out the tasks authorized by section C [of Resolution 687]" [see 29 May]. It asks the Secretary General for recommendations by 17 July "as to the most effective means by which Iraq's obligations in this respect may be fulfilled" [see also 9 Jun]. {S/RES/699; WP 19 Jun}

17-21 June In Geneva, 44 specialists from 25 countries assemble for the initial meetings of the Technical Group on Analytical Data Base and Laboratories recently established under the chairmanship of Dr Marjatta Rautio of Finland by the CD Ad Hoc Committee on Chemical Weapons [see 27 Mar]. {CD/CW/WP.349}

19 June In Belgium, the Public Prosecutor opens a preliminary investigation of a Brussels-based company that had tried to ship to Iran 100 tons of sodium cyanide purchased from the Soviet Union via Germany. The barred and returned shipment [see 28 Sep 90] had just been found in a warehouse in Ghent. {*De Standaard* (Brussels) 20 Jun}

20 June Argentina proposes at the CD that, during the projected ministerial-level conference aimed at providing a final political boost to the CWC negotiation [see 6 Jun], countries with unilateral anti-chemical-weapon export controls in place "announce that, as from the entry into force of the convention, they will recognize the primacy of this instrument and cease to apply controls of this type to the States Parties."

The Argentinian statement, which addresses other aspects of the negotiation, especially chemical-industry controls, concludes: "It has been said that the illusion of security is worse than the absence of security. A verification system more concerned about monitoring civil activities than about setting up a solid and comprehensive system of challenge inspections may in our view lead to an unhappy combination of high costs and an illusion of security." {CD/PV.596}

20 June In Geneva, the CD revises the mandate of its Ad Hoc Committee on Chemical Weapons, asking it to strive "to achieve a final agreement on the Convention by 1992"; and it now explicitly requires that the Convention prohibit use of chemical weapons [see 7 and 14 Feb]. {CD/1085}

24-27 June In Geneva, representatives of the chemical industry meet first among themselves and then with CD delegations to discuss matters relating to the CWC. They submit to the CD a joint proposal by the US Chemical Manufacturers Association (CMA), the Canadian Chemical Producers Association, the Japan Chemical Industry Association, the Australian Chemical Industry Council and the European Council of Chemical Industry Federations (CEFIC). The proposal envisages the CWC international inspectorate being allowed "to examine any commercial chemical manu-

facturing site for evidence of chemical weapons production." {CMA news release, 25 Jun}

Prior to the meeting, CMA and CEFIC had agreed to three joint statements, including one on nonproduction verification under the CWC {*CEFIC and CMA Position on Chemical Weapons Convention Issues Affecting the Chemical Industry*}. This statement, subsequently endorsed by the other industry associations, criticized the concept of 'capable plant sites' and the proposed 'Schedule 4' list of chemical conversion processes [see 14 Feb, Sweden] on the grounds that they "would constitute an endless source of disputes." Instead, the statement proposed an approach which it summarized thus:

"We appreciate the continued interest within the Ad Hoc Committee on CW in refining and improving the system of verification.

"The concept of a qualitative approach in inspections and of a system of selection of inspection locations with nomination by States Parties and random selection by the Technical Secretariat of an agreed finite number of sites to be inspected are welcomed.

"Furthermore, to solve the problem of 'capability' and create a sufficient degree of confidence that capabilities in the chemical industry are not used in violation of the Convention, we, CMA and CEFIC, are prepared to give access to any plant carrying out chemical production, assuming that additional measures, detailed [earlier in the statement], form a part of the system.

"The openness of the chemical industry worldwide requires a verification system which strongly contributes to the protection of confidential business information. Only a qualitative approach can fulfil the prerequisite.

"We hope that this proposal will help to very soon conclude a verifiable, comprehensive and workable Convention on CW."

The proposal would thus do away with any application of materials-flow balancing in nonproduction verification.

25 June Spain introduces into the CD a report on a National Trial Inspection it had conducted, at an unspecified time, within an unidentified sector of its civil chemical industry {CD/1082}. Its representative says that an important purpose of the experiment had been "to set in motion a mechanism for raising awareness in the public and private sector in Spain about the implications for either side that will undoubtedly stem from the entry into force of the convention." He announces, further, that his government is undertaking a detailed study of the possibility of early withdrawal of the Spanish reservations to the Geneva Protocol {CD/PV.597}.

25 June Canada reaffirms to the CD its long-standing undertaking to re-examine its reservations to the Geneva Protocol "with a view to withdrawing these reservations once the CW Convention has come into effect." {CD/PV.597}

25 June The United States, as promised by President Bush [see 13 May], provides the CD with information about its export controls on CW-weapons-related materials and technology and about its domestic legislation to enforce those controls {CD/1086}. The information comprises copies of Executive Order 12735 [see 16 Nov 90], the White House fact-sheet on the President's Enhanced Proliferation Control Initiative (EPCI) [see 13 Dec 90], the regulations implementing the Executive Order and the EPCI as published in *Federal Register* [see 7 Mar], and the White House press-releases that announced publication of the regulations.

Further, the United States submits three technical working papers to the CD Ad Hoc Committee on Chemical Weapons. Two are on the information-processing requirements of the projected CWC international organization, one focussing specifically on the analytical database which will eventually form part of the overall Technical Secretariat database {CD/CW/WP.346; CD/CW/WP.345}. The third paper is on how to assure high-quality work in laboratories charged with sample analyses for CWC verification purposes {CD/CW/WP.347}; the paper is an adaptation of a recent journal article {*American Environmental Laboratory* Oct 90}. These papers were among those that had been submitted as background papers for the recent meeting of the Ad Hoc Committee's Technical Group on Analytical Data Base and Laboratories [see 17-21 Jun].

25 June In the US House of Representatives, the Foreign Affairs Subcommittee on International Economic Policy and Trade authorizes subpoenas to compel the Administration to disclose documents concerning the export of technologies from the United States to Iraq during the 1980s, including the sale of biological agents [see 8 Apr]. {DD 26 Jun}

26 June In the UN Security Council, US representative Alexander F Watson says that the United States has "strong evidence" that Iraq had under-reported its stocks of chemical weapons and ballistic missiles. He says, too, that Iraq was trying to conceal factories for making these weapons, and raises doubts, but without offering proof, about Iraq's denial of possessing biological weapons. {IHT 28 Jun}

27 June The government of Sri Lanka informs the CD that "it is actively considering becoming an original signatory to the [chemical weapons] convention, when it is ready for signature upon conclusion." {CD/PV.598}

27 June In the CD Ad Hoc Committee on Chemical Weapons, 8 of the Group of 21 neutral and nonaligned member-states -- Egypt, Ethiopia, Indonesia, Iran, Kenya, Nigeria, Pakistan and Yugoslavia -- submit a proposal on chemical-industry controls under Article VI of the CWC which, in effect, accepts the principle of extending controls to civil factories capable of producing scheduled chemicals, not just those that actually do produce such chemicals. {CD/CW/WP.348}

27 June The CD concludes its second session of the year [see 16 May], being due to reconvene on 25 July.

28 June In Slovenia, where there have been clashes between secessionists and Yugoslav federal forces, Ljubljana radio announces that the Directorate of Internal Affairs in Kranj has said "there is a possibility that the [Yugoslav] army might use gas -- that is, chemical weapons" {Ljubljana radio broadcast 28 Jun in BBC-SWB 29 Jun}. Slovene President Kucan tells journalists that chemical weapons have been found in Yugoslav army tanks and helicopters {ORF (Vienna) telecast 28 Jun in FBIS-EEU 1 Jul}. Slovene Defense Minister Jansa later tells a press conference that "pilots who defected to our side ... told us that containers with poisons for war use are attached to some aeroplanes" {Ljubljana radio 7 Jul in BBC-SWB 9 Jul}.

30 June German Economics Minister Jürgen Möllemann, having just visited Tehran, reportedly states that the President of Iran, Hashemi Rafsanjani, has given assurances that Iran supports a ban on chemical weapons and is prepared for a unilateral renunciation of their production. He says that careful consideration will now be given to the Iranian request for German aid in establishing a pesticide production plant at Qazvin [see 27 Mar] {DPA 30 Jun in BBC-SWB 9 Jul}. A consortium of German companies, led by the Lurgi group, has been awaiting Federal authorization {MEDNews 22 Jul}.

30 June In the United States, the President's Defense Base Closure and Realignment Commission releases its recommendations. Among other decisions, it has decided against the Defense Secretary's recommendation [see 12 Apr] that Fort McClellan, the home of the Army Chemical Corps, be closed {NYT & WT 2 Jul}. The commission's recommendations are later accepted by President Bush {CQ 13 Jul}.

1 July There are press reports that the European Community has agreed upon a need for greater international cooperation in preventing the spread of chemical and nuclear weapons, and, acting upon the request of Belgium, the Netherlands and Italy, has begun a comparative study of the relevant policies of each member state, aiming ultimately to achieve consensus on a common policy. {*De Standaard* (Brussels) 1 Jul}

1-5 July In Mexico City there is a regional conference under the auspices of the UN World Disarmament Campaign, the final two days of which concentrate on issues of chemical disarmament. The occasion constitutes the regional seminar on chemical weapons originally proposed by the Venezuelan Government, with participation from CD delegations and officials from Latin American and Caribbean states [see 21 Mar].

2 July Chinese Prime Minister Li Peng, speaking in Cairo, says that all Middle East countries should reduce their weapons "in a balanced way and ban the use of nuclear, chemical and biological weapons and destroy all they hold." {FT 5 Jul}

4 July In Egypt, Foreign Minister Amre Moussa puts forward proposals for arms control in the Middle East, including the removal of nuclear, chemical and biological weapons from the region [see also 28-30 May 90 and 3 Apr], with a UN mechanism for verifying compliance. {MENA 4 Jul in FBIS-NES 5 Jul; FT & NYT 5 Jul}

5 July In southern Slovenia, gas masks are being improvised as a part of local precautions against renewed fighting with Yugoslav federal forces [see 28 Jun]. {DTel 6 Jul}

5 July The *Los Angeles Times* quotes unidentified US officials as saying that President Bush believes he has full UN Security Council support to launch a military strike if Iraq continues to block UN inspections under the ceasefire resolution, and that the strike would be directed against nuclear sites, storage facilities and chemical or biological warehouses discovered since the war ended. {DTel 6 Jul}

Later, after Iraq has on 7 July made a further declaration to the United Nations about its nuclear programs, which is also characterized by US officials as incomplete and misleading, the press is told on 12 July that President Bush has approved a list

of about 20 targets for attack if Iraq refuses to comply with the UN demands {IHT 13-14 & 17 Jul}. After another such declaration, on 14 July, the five permanent members of the UN Security Council impose a deadline of 25 July upon Iraq for complete disclosure of the extent of its nuclear programs {FT 16 Jul}.

8 July In Lagos a seminar on the CWC is opened by Nigerian Defense Minister and Chief of Defense Staff General Sani Abacha. In regard to the scope of the treaty, he calls on industrialized nations to consider the interests of developing countries whose chemical industries are still in their infancy. The Defense Ministry had said earlier that the aim of the seminar would be to educate chemical industries on the implications of banning or restricting some dual-purpose chemicals. {Radio Nigeria 8 Jul in FBIS-AFR 10 Jul}

8 July In the US Congress, the General Accounting Office submits to the Chairman of the Senate Governmental Affairs Committee, John Glenn, the report of an investigation he had requested into security controls at government and contractor laboratories engaged in the Defense Department's CBW research program. The report recommends minor changes. {GAO/NSIAD-91-57}

8 July In Geneva, the intersessional session [see 13 Jun] of the CD Ad Hoc Committee on Chemical Weapons begins. It is due to end on 19 July.

8 July The *Washington Times*, attributing unidentified "Bush administration officials," and the German weekly *Stern*, quoting unidentified CIA sources, report that US satellite photographs have shown large quantities of Soviet chemical weapons being taken at night out of six storage depots in eastern Germany in camouflaged trains and trucks during the previous three weeks and then shipped to the Soviet Union out of the port of Rostock [see also 5 Jun] under the guise of being a withdrawal of nuclear weapons {WT 8 Jul, *Stern* 11 Jul}. The reports are rejected by the Federal German Defense Ministry {DPA 9 Jul in FBIS-WEU 10 Jul; Ind 10 Jul}, by the USSR Western Group of Forces {TASS 10 Jul in BBC-SWB 12 Jul; DPA 10 Jul in FBIS-WEU 11 Jul} and by the Deputy Chief of the USSR General Staff, Col-Gen Krivosheyev {Izv 13 Jul in FBIS-SOV 15 Jul}.

8 July In Romania, a governmental Ministerial Order enters into force establishing licensing requirements for the export or import for the 50 chemicals on the Australia-Group list as well as certain categories of dual-use production equipment. {CD/CW/WP.365}

8-9 July In Paris the five permanent members of the UN Security Council hold an initial round of talks on conventional arms transfers and the nonproliferation of weapons of mass destruction with a particular focus on the Middle East, their agenda including the proposals put forward by President Bush in his Middle East Arms Control Initiative [see 29 May] and by President Mitterrand in his Plan for Arms Control and Disarmament [see 3 Jun and see also 2 and 4 Jul]. Representation is at the level of senior officials. {FT & IHT 8 Jul, NYT 10 Jul, FT 11 Jul}

In the final communiqué, the representatives of China, France, the Soviet Union, the United Kingdom and the United States say that they "strongly supported the objective of establishing a weapons of mass destruction-free zone in the Middle East," continuing: "They expressed their view that critical steps towards this goal in-

clude full implementation of UNSC Resolution 687 and adoption by countries in the region of a comprehensive program of arms control for the region, including: a freeze and ultimate elimination of ground to ground missiles in the region; submission by all nations in the region of all of their nuclear activities to IAEA safeguards; a ban on the importation and production of nuclear weapons usable materials; agreement by all states in the region to undertake to becoming parties to the CW Convention as soon as it is concluded in 1992." The communiqué also registers agreement to develop guidelines for arms transfers into the region based on "rules of restraint." These guidelines are to be considered at the next round of talks, in London during the autumn. {CD/1103}

9 July The UK House of Commons passes the Arms Control and Disarmament (Inspections) Bill. The purpose of the legislation is to create rights of access, entry and inspection for the conduct of challenge inspections (under the CFE Treaty) and to confer privileges and immunities on the inspectors. {HansC 9 Jul}

10 July The UK government brings 13 more potential CW-agent precursors under formal export control {Statutory Instruments 1991 No. 1583}. All 50 chemicals on the Australia-Group list [see 21-23 May] are now under statutory control in Britain.

12 July The CD Ad Hoc Committee on Chemical Weapons receives a report on a second round-robin test [see 11 Apr 90] in which laboratories from 15 participating countries -- Australia, Canada, China, Czechoslovakia, Finland, France, Germany, India, Netherlands, Norway, Sweden, Switzerland, UK, USA and USSR -- had analyzed spiked samples simulating ones gathered during inspections under the CWC of civil-industry facilities where the pesticide dichlorvos was being made from the Schedule-3 chemical trimethyl phosphite. In the test's scenario, the facilities were also used to produce the Schedule-1 chemical octyl methylphosphonofluoridate, with which some of the samples had been spiked. Only two of the laboratories reported finding the spike chemical, perhaps because participants had been told that the samples did not contain "CW agents." The test had been run by Finland, the samples being prepared by Australia. {CD/CW/WP.350}

The purpose of the test had been, in the words of the comprehensive report subsequently issued in the Finnish 'Blue Book' series, "to test and further develop procedures for sample preparation and analysis, in order to determine their effectiveness in the verification" of the CWC. Dr Marjatta Rautio, director of the Finnish project, writes in her preface to the comprehensive report: "An important achievement of this year's exercise was the clarification of criteria for the acceptable and unambiguous identification of compounds and for future reporting to the Technical Secretariat of analytical results. The test clearly showed that existing advanced instrumentation is adequate for off-site analyses. It also showed what kind of results can be expected on-site, supposing that the transport of equipment does not cause extra problems. More testing is required in real conditions" {CD/1090}. This and other conclusions she develops further in her later oral report to the CD {CD/PV.599}.

13 July The Belgian parliament adopts by majority vote the bill on arms exports [see 8 Mar]. The administration now becomes obliged to issue executive orders implementing the legislation,

including appropriate definitions of chemical and biological weapons and of the associated technology.

14 July A French television program quotes a French army doctor who had treated civilian casualties in southwestern Iraq sprayed with sulfuric acid from government helicopters 8 days after the Kuwait-War ceasefire [see also 21 Mar]. The program shows film of the casualties. {DTel 15 Jul}

15 July In South Korea, the Defense Ministry states to the National Assembly that North Korea has recently formed a Scud missile brigade and has already produced more than a thousand tons of chemical warheads. {Yonhap 15 Jul in FBIS-EAS 15 Jul}

15 July France submits to the CD Ad Hoc Committee on Chemical Weapons a report on a further national trial inspection conducted within its civil chemical industry. The trial had sought to assess the effect on the industry of a system not of routine but of ad hoc verification, particularly as regards impact on confidentiality. {CD/CW/WP.351}

15 July A joint paper on the challenge inspection of undeclared facilities is submitted to the CD Ad Hoc Committee by Australia, Britain, Japan and the United States {CD/CW/WP.352}. It proposes treaty provisions whereby the challenged state and the international inspectors negotiate a definition of the perimeter of the site to be inspected, the definition being subject to final approval by the challenged state. In its consequent loosening of the obligation to accept on-site challenge inspections, the proposal is a radical departure from earlier concepts; and it envisages, moreover, a substantially longer period being allowable between the challenge and the inspection.

The British government, which had long been advocating a more probing managed-access concept [see 6 Jun], later describes the paper to Parliament as "US proposals for a challenge inspection regime ... co-sponsored by the United Kingdom, Japan and Australia." {HansC 25 Jul}

Unidentified US Defense Department sources reportedly say that the reason for the US walk-back from its original "anytime, anywhere" position on challenge inspection is concern for the security of radar-evading Stealth technology and other such advanced military development: as explained by *Newsweek*, Stealth aircraft are made from spun-graphite cloth using special hardening chemicals, and analysis of vapor samples picked up by CWC inspectors could "reveal the Stealth fabric's secret" {*Newsweek* 5 Aug}. "The senators who vote billions for these secret programs want to know they will be protected," a diplomat in Geneva is reported as saying {NYT 14 Aug}.

Although such concern for the security of US military technology is appreciated in much of the immediate domestic commentary, the proposal is criticized on the grounds, especially, that it could create loopholes in the overall CWC verification system so large as to render worthless much of the routine inspection machinery already agreed {WSJ 15 Aug}. One of the US Congressional observers of the CWC negotiation, Representative Martin Lancaster, estimates that the proposal would reduce the verifiability of the CWC to "no better than 10 or 15 percent" {C&EN 19 Aug}. And commentators observe, apparently on good authority, that the United States has yet to conduct a practice chemical challenge inspection on managed-access principles at any 'black' location {WP 28 Jul}.

A *New York Times* editorial says: "Even as the United Nations is pressing Iraq to open all its chemical weapons facilities to international inspectors, President Bush has backed away from requiring similar inspections to verify a treaty to ban chemical weapons. The new US proposal ... makes a sham of Mr Bush's professed determination to curb proliferation." {NYT 25 Jul}

France subsequently proposes strengthening amendments which reportedly have wide support, including that of the other Western Group members and the Soviet Union {NYT 14 Aug}. These amendments are put forward as an informal proposal {Undated non-paper, *Challenge inspection: proposals of amendment to CD/CW/WP.352*}.

15 July Australia submits to the CD Ad Hoc Committee a paper outlining a possible technical remedy to the principal practical problem created by listing chemicals generically rather than specifically in the CWC control schedules {CD/CW/WP.353}. The problem arises because some of the families of chemicals so listed in the current Rolling Text contain several thousand members, a great many of which have not yet been characterized to the point where they are detectable by the analytical instruments that inspectors may be able to use on site without jeopardizing legitimate industrial secrets.

The paper points out that there are, in theory, 877 different O-alkyl methylphosphonofluoridates besides sarin and soman, even when the alkyls are limited to unsubstituted noncyclic ones no larger than decyl [i.e. excluding such prominent nerve gases as agent GF and *trans*-2-methylcyclohexyl methylphosphonofluoridate]. However, large though that number is, the different compounds fall into no more than ten distinct groups that are each identifiable as such without at the same time having to identify non-scheduled chemicals. The Australian proposal outlines a way of doing this.

16 July At the Group of Seven summit in London, the heads of state or government of Canada, France, Germany, Italy, Japan, the United Kingdom and the United States issue a declaration that reaffirms the Group's commitment to the abolition of CBW weapons, including the intention of its members to "become original parties" to the CWC and to "strengthen controls on exports which could contribute to the proliferation" of CBW weapons [see also 10 Jul 90]. The declaration continues: "Use of such weapons is an outrage against humanity. In the event that a state uses such weapons each of us agrees to give immediate consideration to impose severe measures against it both in the UN Security Council and elsewhere." {London Economic Summit 1991, *Declaration on Conventional Arms Transfers and NBC Non-Proliferation*, 16 Jul; FT 17 Jul}

16 July In Washington the Center for Strategic & International Studies convenes a one-day international conference on Chemical Disarmament and US Security, at which the keynote speaker, Director of the US Arms Control & Disarmament Agency Ronald Lehman, introduces the new US position on challenge inspection [see 15 Jul], anticipating some of the criticism which subsequent speakers direct against it. {C&EN 29 Jul}

16 July The US Defense Department issues two weeks late an interim report, in both classified and unclassified versions, on lessons learned from the Kuwait War, *Conduct of the Persian Gulf*

Conflict, as required by Congress {AD & WP 17 Jul}. Included in the report is an account of inadequacies in BW defense measures. There had been intelligence warnings about the possibility of Iraqi anthrax and botulinal-toxin weapons, but "there were no fielded systems to detect covert attacks" with such weapons until late in the war. Also, US forces initially "did not have a policy regarding vaccination against BW agents," and vaccines had not become "available in significant quantities until early 1991."

18 July In the US Congress, the US ambassador to the United Nations, Thomas Pickering, gives testimony on the implementation of UN Kuwait-War ceasefire Resolution 687 and the work of the UN Special Commission (UNSCOM). His prepared statement includes:

"As you know, Iraq has denied that it manufactured or possesses biological weapons. Here again we have reason to believe this is false. UNSCOM will commence shortly inspections of sites it designates in order to test the Iraqi claim.

"The chemical weapons effort is now fairly far along. UNSCOM has inspected one of 12 declared sites [see 18 Apr and 16 May]. UNSCOM is now preparing a destruction plan which will require bringing existing mobile and transportable disposal facilities from other countries to a central location in Iraq where the bulk agent and munitions will be brought for destruction." {Prepared statement before the House Foreign Affairs Subcommittees on Human Rights and International Organizations and on Europe and the Middle East}

19 July In Geneva, the CD Ad Hoc Committee on Chemical Weapons concludes its intersessional session [see 8 Jul].

19 July In the US Congress, the Senate Armed Services Committee issues its report on the FY 1992 Defense Authorization bill. The report includes an instruction to the Defense Department to undertake a comprehensive study aimed at evaluating the use of "nonlethal systems that incapacitate or immobilize an opponent" as substitutes for lethal weapons; the study should be conducted "outside normal Service development channels in order to promote the widest possible search of promising ideas." {ITP 1 Aug}

21 July Egypt transmits to the UN Secretary General its proposals [see 4 Jul] for arms reductions in the Middle East, including the establishment of the region as a zone free of weapons of mass destruction. {A/46/329; S/22855 (both contained in CD/1098)}

Among these proposals, Egypt "calls on those nations of the region which have not yet done so to declare their commitment to adhere to the Treaty on the Non-Proliferation of Nuclear Weapons, as well as to the Convention concerning the prohibition of biological weapons of 1972, no later than the conclusion of the negotiations on the prohibition of chemical weapons being conducted by the Conference on Disarmament in Geneva."

24 July In Washington, the Department of the Army announces its decision regarding chemdemil of the CW-weapons stockpile at Anniston Army Depot, Alabama [see 21 May]: a fullscale disposal facility is to be built at the depot using the JACADS reverse-assembly/incineration technology. Construction is expected to begin in late 1992 or early 1993 and take about 31 months to complete. Actual destruction operations are expected to take about

38 months, once the facility has been tested and proved. {FedR 25 Jul pp. 34055-6}

25 July In Geneva, the CD reconvenes for the third and final part of its 1991 session, which is due to end on 5 September. Malta is admitted to it, and to the Ad Hoc Committee on Chemical Weapons, as a participating nonmember {CD/PV.599}, the 37th such participant in the 1991 session [see 13 Jun].

25 July Peru informs the CD that, in Lima this coming November, it is convening a conference of the foreign ministers of the Rio-Group countries -- Argentina, Bolivia, Brazil, Colombia, Chile, Ecuador, Mexico, Paraguay, Uruguay and Venezuela -- and that one objective of the conference is "to agree expressly on a joint renunciation of all types of weapons of mass destruction." {CD/PV.599}

25 July Romania informs the CD that its parliament had, in June, adopted a law withdrawing its reservations to the 1925 Geneva Protocol and that France, as depositary, had been notified accordingly. {CD/PV.599}

25 July The British government informs Parliament of its intentions for the Third BWC Review Conference, in September: "We shall be submitting proposals to strengthen the existing provisions of the biological weapons convention and to maintain its status as an important international norm against biological and toxin weapons. Central to our policy will be proposals to improve and extend the regime of confidence building measures, to improve organizational arrangements by establishing a supportive body and to examine the feasibility of devising effective verification procedures." {HansC 25 Jul}

25 July In the UK House of Commons on the last day of Parliament the Trade and Industry Committee publishes memoranda of evidence it had taken on British defense-related exports to Iraq since 1984 {TL 26 Jul}. Included is a memorandum submitted in April by the Department of Trade and Industry (DTI) providing statistics on UK exports of chemicals to Iraq during 1988 through October 1990 which seem to show that UK firms had sold to Iraq some £0.5 million-worth of a dozen or so different chemicals currently on the Australia-Group control list, including large amounts of the mustard-gas precursor, thiodiglycol. This is noticed by the *Independent* newspaper {Ind 27 Jul}, and a considerable political furor develops {STel 3 Aug} until the DTI demonstrates that its original memorandum was in error {*Export Controls in Relation to Iraq: Supplementary Paper* 8 Aug; Guar 9 Aug}. Not only had none of the CW precursors listed in the memorandum in fact been exported; but one precursor which had actually and wrongly been exported--£686-worth of sodium cyanide in May 1990--had not been listed {FT & Guar 9 Aug}.

The DTI states that there are "approximately 10 producers and 20 traders in the UK" of chemicals on the Australia-Group list. {DTI *op cit*}

25 July In the US House of Representatives an amendment to the bill reauthorizing the National Institutes of Health, HR 2507, is passed whereby the Secretary of Health and Human Services would be required to report to the Congress on the appropriateness and impact of the NIH taking over the country's medical BW defense programs, the report to be prepared in cooperation with

the Defense Department and other Federal agencies. {CR 25 Jul pp. H5868-9}

29 July In Micronesia, at Pohnpei, leaders of the 15 nations of the South Pacific Forum in annual conference [see also 27 Oct 90] are scheduled to consider a report on the US chemdemil operations on Johnston Atoll [see 6 Nov 90 and 27 Feb], including an account of shutdowns and equipment failures. {DTel 29 Jul}

29 July The US Senate passes its FY 1992-93 State Department Authorization bill, S.1433, with an amendment requiring the President to impose sanctions on foreign governments that use CBW weapons {CR 29 Jul pp. S11125-30}. The sanctions would include termination of all US assistance and credits, as well as trade restrictions; the President would be allowed little latitude in imposing them. They are described as tougher than those attached to S.320, the Senate reauthorization of the Export Administration Act [see 20 Feb], which is currently bogged down in the House {CQ 3 Aug}.

30 July The Executive Chairman of the UN Special Commission reports to the UN Security Council that there are more chemical weapons and related materials in Iraq than Iraq had originally declared [see 17 May]: 46,000 chemical munitions and 3000 tons of precursor chemicals in contrast to the ca 11,000 munitions and 650 tons declared. Chairman Rolf Ekéus states that a large number of the chemical weapons contain "tear gas" {NYT 31 Jul}. The total CW stockpile is estimated at about 2000 tonnes of agents, bulk and weaponized {FT 3-4 Aug}. The bulk agent is later reported to include over 400 tons" of mustard gas and "about 150 tons" of nerve gas, most of it sarin but also some GF and tabun; tear gas -- agent CS -- was mostly weaponized; about 2000 CS mortar rounds had been destroyed by bombs during the war {C&EN 19 Aug}.

The uncovering of information about the greater-than-declared stocks is attributed in Western reporting to the UN inspection teams themselves, but the Iraqi Foreign Ministry describes this as a deliberate distortion of what Ambassador Ekéus had actually said. The Iraqi statement continues: "[O]n 18 April 1991, Iraq submitted a list of the materials included in Paragraph C of Resolution 687, including the chemical raw material, which was collected expeditiously with the emphasis on counting the important material at that time. After the Iraqi parties made a complete inventory of all this material, including large quantities of less important and less hazardous raw material, when certain military installations where this substance was stored became accessible after being purged of mines and the effects of the aggressive bombardment, the responsible Iraqi quarters submitted on 16 May 1991 a comprehensive list of the chemical raw material, which was actually four to five times the quantity listed in the first announcement before the visit to Iraq by the first chemical inspection team...." {INA 3 Aug in FBIS-NES 5 Aug}

1 August The UN Secretary-General submits to the Security Council for its approval the plan required under Resolution 687 for monitoring and verifying Iraq's compliance with its undertaking "not to use, develop, construct or acquire" CBW weapons, agents, components or facilities, the plan to enter into force immediately upon approval. The plan envisages the Special Commission having power to inspect "at any time without hindrance ... any

site, facility, activity, material or other item in Iraq," reporting every six months to the Security Council.

As regards chemical weapons, the plan includes two annexed lists of chemicals that are to be subject to particular monitoring and verification -- dual-use chemicals in List A and, in List B, predominantly single-use chemicals plus those dual-use chemicals which Iraq actually used "as essential precursors for chemical weapons." List-A chemicals, and equipment or facilities using them, are to be subject to regular data-reporting requirements, as is "any site or facility which is involved in the production or processing of organophosphorus chemicals or which is involved in production of organic chemicals by chlorination." List-B chemicals are, in effect, to be excluded from the Iraqi economy except by prior arrangement with the UN Special Commission.

List B comprises Schedule 1 of the draft CWC in its CD/1046 (January 1991) version plus dimethyl methylphosphonate, the NN-dialkylphosphoramidic dihalides [see 14 Jun] and thiodiglycol.

List A comprises all the other chemicals scheduled in CD/1046 plus cyclohexanol [see 14 Jun], hydrogen fluoride and the irritant agent CS [see 30 Jul]. {S/22871}

1 August Pakistan at the CD describes the recent Australian-British-Japanese-US proposal on challenge inspection [see 15 Jul] as "a brave and positive attempt to break the deadlock on this issue." Ambassador Kamal then goes on to identify Pakistan's primary concerns on the issue, beginning with "the imperative need for including clear conditions which prevent abuse of challenge inspection procedures." His statement links the issue with progress on Articles VI, X and XI. In what is presumably intended as a reference to the Australia Group, he says that Article XI "should incorporate ... an undertaking that existing discriminatory mechanisms will be dismantled once the convention comes into force."

Ambassador Kamal continues: "As in the case of the suggestion that has been repeatedly heard in this forum, calling on all States to declare their intention to adhere to a future convention even while its text is still under negotiation, perhaps member States who, individually or collectively, apply export controls and restrictions on the transfer of certain chemicals may consider declaring their intention to dismantle these measures for the States who signed the future chemical weapons convention." {CD/PV.600}

2 August In Iraq, a UN Special Commission team of 28 people from 9 countries -- Australia, Canada, Czechoslovakia, France, Germany, the Soviet Union, Sweden, the UK and the USA -- under the leadership of Dr David Kelly of the UK Chemical & Biological Defence Establishment, Porton Down, arrives on a 5-day visit to conduct the first BW-related inspection under Resolution 687 {WP 6 Aug}. They meet in the evening with Iraqi officials who provide information supplementing earlier disclosures and who, while reaffirming the nonexistence, as previously declared to the UN, of any "central research laboratory for military biological purposes," disclose "the existence of research work regarding the biological factors for military purposes in one of the locations within a general research center which does other research work," a place which the team subsequently inspects {INA 4 Aug in FBIS-NES 5 Aug} and which the UN soon afterwards discloses is at Salman Pak [see 11 Apr 90 and 28 Feb] {WP 6 Aug}. The Iraqi officials say that this biological research work had stopped completely in 1990. Next evening the team meets with represen-

tatives of the Ministries of Health and Agriculture {INA 4 Aug in FBIS-NES 5 Aug}.

During day 3 of the visit, Dr Kelly tells reporters: "It's actually been excellent. Every request I have made has been met, or they have said they will meet it." {IHT 5 Aug}

2 August The US Senate, by a vote of 97-2, adopts a sense-of-Congress resolution approving the "use of all necessary means" by the Administration to eliminate Iraq's ability to produce nuclear, biological or chemical weapons. The resolution is an amendment to the FY 1992 Defense Authorization bill. {IHT 3-4 Aug}

4 August In Britain the death is reported of Dr C E Gordon Smith, the last director of the former Defence Ministry Microbiological Research Establishment. {TL 10 Aug}

5-7 August In El Escorial, Spain, an expert workshop on Anti-chemical Protection, its Potential and its Relation to the Spread of Chemical Weapons and their Elimination is convened by the Harvard-Sussex Program in cooperation with the Pugwash CW Study Group. There is specialist participation from Australia, Belgium, Canada, China, Egypt, Germany, Israel, Jordan, the Netherlands, Pakistan, Poland, the Soviet Union, Switzerland, the UK, the USA and Yugoslavia. [See box, page 18.]

6 August Poland and the USSR submit a joint report to the CD on a practice challenge inspection that had been conducted during April at two Soviet military bases in Poland [see 17-18 Apr], one a "central artillery depot," the other a "central chemical depot." The stated purpose was, *inter alia*, "to confirm, insofar as Poland's territory is concerned, the USSR declaration on non-possession of chemical weapons outside its territory." {CD/1093}

6 August The Netherlands submits a working paper to the CD Ad Hoc Committee on Chemical Weapons disclosing results obtained at the country's CW defense laboratory with the new analytical technique of thermospray-interfaced liquid-chromatography/mass-spectrometry when applied to water samples containing CW agents and their degradation products. {CD/CW/WP.355}

6 August The United States submits a proposal to the CD Ad Hoc Committee for challenge inspection procedures at declared facilities. {CD/CW/WP.356}

7 August In Iraq, the first UN biological inspection team concludes its visit [see 2 Aug]. Team Leader David Kelly says to reporters: "We have not found evidence that they possess biological weapons at the site we visited." He adds: "They were undertaking research, they were using fermentation and therefore they were able to produce reasonable quantities." {IHT 7 Aug; AFP 7 Aug in FBIS-NES 8 Aug}

There is a news conference on the inspection one week later at United Nations headquarters in New York. The Secretary General's press release on it reads as follows:

"Iraq had previously declared that it had no biological weapons nor carried out any related activities.

"In order to verify this declaration, a team of 28 personnel (UNSCOM 7) lead by the Chief Inspector, Dr David Kelly, undertook an inspection of Iraq's biological warfare capability from 3rd to 7th August inclusive. The team comprised experts in microbiology and biotechnology, safety, medicine and communication.

Antichemical Protection and the CWC

Following are excerpts from the conveners' (M. Meselson and J.P.P. Robinson) report on a workshop on Antichemical Protection, its Potential and its Relation to the Spread of Chemical Weapons and their Elimination, held in El Escorial, Spain [see News Chronology, 5-7 August]. The workshop papers are being published as No. 2 in the new series Harvard-Sussex Program Papers, particulars of which are available from Julian Perry Robinson at SPRU, University of Sussex, Brighton, UK.

"It is possible to protect people against chemical-warfare 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 battlefield weapon. How far it is a characteristic that is displayed in practice, and what its wider implications might be, were the main matters before the workshop.

The agenda included presentations on diverse aspects of antichemical protection, including the calculation of realistic threat levels for the design of protection; the design and performance of detectors, respirators, protective clothing and collective protection; decontamination; medical countermeasures; the protection of civil populations; the military effects of antichemical protective posture; doctrine and training; implications for chemical disarmament; and the provisions of the Chemical Weapons Convention in its current draft that address antichemical protection, especially Article X.

Specialists in antichemical protection from several industrialized and developing countries described the design and performance of protective equipment employed by their national armed forces. ... As the lungs are the part of the body most vulnerable to toxic agents, it was generally agreed that the respirator is the irreducible minimum of individual protective equipment. Calculations presented to the workshop based on toxicological, meteorological and military-operational considerations indicated that the acute respiratory hazard under realistic battlefield conditions in a chemical war would be highly localized and sporadic. Respirators affording protection factors even as low as 100 -- i.e. capable of removing 99 percent of contaminants from air breathed through them -- could keep respiratory casualty levels far below the casualty levels expected for today's conventional weapons. Modern respirators, correctly worn, are capable of providing protection factors hundreds of times better than this. ... The workshop heard about the development of effective charcoal-containing filters and clothing of inexpensive design produced in a developing country. In several countries, charcoal-containing fabrics have passed through successive stages of technological change and newer materials based on poromeric and hydrophilic films are under study.

It was noted that protection of the general civil population is considerably more costly and organizationally more difficult than the protection of military forces. Only very few countries have undertaken it since World War I, all of them relatively wealthy and with small highly organized populations or under acute perception of threat. An effective Chemical Weapons Convention was therefore seen as an important safeguard against the use of chemicals as terror weapons against civil populations.

Modern combined-arms formations have carried out sustained operations in field exercises conducted under Central European weather conditions without experiencing excessive degradation of military performance. The workshop viewed, moreover, a videotape showing a field exercise conducted in hot dry weather in full sunlight in a Middle Eastern desert in which infantry accomplished a dismounted assault lasting several hours in full antichemical protective gear without suffering heat illness. Such experience, however, would not be applicable under conditions of high relative humidity, in which evaporative cooling would be much less. The overall conclusion is that, while antichemical protection will impose some degree of burden on logistics and performance especially in hot humid weather, it greatly reduces the effectiveness of chemical weapons and, hence, the incentives for their acquisition and use.

The following broad conclusions about the significance of antichemical protection for chemical disarmament could therefore be drawn. First, antichemical protection can favor compliance with the Chemical Weapons Convention by reducing the incentive for having chemical weapons. Secondly, antichemical protection can enhance the effectiveness of verification by forcing a would-be violator to increase the scale and therefore the detectability of any production, storage, and other proscribed activities he might undertake. Thirdly, if violations nevertheless occur, antichemical protection can render them much less dangerous. In short, antichemical protection can increase the security benefits and decrease the risks of chemical disarmament.

The workshop accordingly saw good reason why antichemical protection should be maintained at near-present levels during the ten-year period of stockpile-destruction following entry into force of the Chemical Weapons Convention. The likelihood was envisaged, however, that after the 10-year period and depending on the universality and performance of the Convention, there would be a trend toward lower levels of protective effort, with priority given to maintenance of respiratory protection for military forces. At the same time there would be continued need for effort in respiratory protection for peaceful purposes, as in protection against toxic hazards encountered in industry.

Many participants considered, further, that, since chemical disarmament, to be most effective, must be global, antichemical protection should be accessible to all States Parties to the Chemical Weapons Convention. This provides an argument for openness and cooperation in matters of antichemical protection among States Parties. Indeed, access to such cooperative efforts could be one of the benefits of the Convention, thereby favoring universal membership."

"On the first day, Iraq declared that biological research activities for military purposes were initiated in Iraq in mid-1986 at the Salman site. Research was stated to be undertaken on *Clostridium botulinum*, *Clostridium perfringens*, and *Bacillus anthracis*. Military research was later explained to comprise research which could be used for both defensive and offensive purposes.

"The inspection undertaken was a full inspection of a site near Salman Pak. It required five full days. Discussions were also held with senior representatives of the ministries of health and agriculture to define a base of microbiological, especially pathogen, activities within Iraq.

"At the Salman site, the team discovered a capability to research, test and store biological warfare agents. Fermentation, production, aerosol testing and storage existed at that site. However, no evidence of biological weapons per se was obtained and no facility for filling weapons was determined. The site had been extensively damaged by Coalition force bombardment, and by the recent physical removal by the Iraqis of key buildings.

"Iraq admitted to have worked on the following biological warfare agents: anthrax and botulinum toxin.

"At the last day, before departure, Iraq handed over a collection of biological materials which could be developed as biological warfare agents. This material included brucellosis and tularaemia.

"At the same time, Iraq stated that it would cease developing biological warfare agents."

Dr Kelly, present at the news conference, is reported as saying that the inspectors had determined that the facility could produce more than 50 gallons of anthrax a week, and that the botulin capacity was still being estimated {WP 15 Aug}. He reportedly says, too, that the Iraqis had told the inspectors that their R & D team at the site consisted of 10 people {WT 15 Aug}.

8 August The United States submits draft treaty language to the CD Ad Hoc Committee that would limit trade in scheduled chemicals to CWC parties only [see also 13 May and 1 Aug]. The United States also proposes that trade in equipment and technology used to produce such chemicals be similarly limited, the task of defining these items to fall to the Preparatory Commission. And an obligation would be written into Article VII requiring each state party to establish and maintain a national system for monitoring imports and exports of the scheduled chemicals, equipments and technologies. {CD/CW/WP.357}

8 August Argentina, commenting critically in the CD plenary on the Australian-British-Japanese-US challenge-inspection proposal [see 15 Jul], states that it "joins the existing proposals and will undoubtedly constitute a major contribution to our deliberations." Ambassador Moritan says, further: "Without seeking to carry the analogy with the activities carried out by the [UN Special Commission] further than prudence dictates in these cases, we believe that there are important lessons which must be drawn from this continuing exercise, in particular with regard to physical access for inspectors and securing of inspected sites." {CD/PV.601}

8 August Poland at the CD plenary says that the Australian-British-Japanese-US challenge-inspection proposal [see 15 Jul] "constitutes ... a good basis for further work on article IX" [see also 1 Aug]. {CD/PV.601}

8 August Egypt proposes at the CD that the CWC should itself

provide that "all States with retaliatory rights under the 1925 [Geneva] Protocol should renounce their reservations at the time they sign the convention." Ambassador Elaraby, continuing a sharply focussed review of outstanding issues in the CWC negotiation in what is his valedictory statement to the CD, also recommends that "a technical assistance program to help parties in organizing a system for monitoring their chemical industry should be devised" in the context of article XI. {CD/PV.601}

11 August In Tel Aviv, *Ma'ariv* reports that a department has now been established within the Israeli Foreign Ministry to deal with conventional and unconventional disarmament in the region. {*Ma'ariv* 11 Aug in FBIS-NES 14 Aug}

13 August The United Kingdom submits to the CD Ad Hoc Committee a paper proposing a simple quantitative criterion of military significance as a means for defining thresholds in the verification regimes to be applied to scheduled chemicals, in this case to Schedule-2B chemicals. The paper states: "Calculations based on simulated battlefield models [discussed in an annex] indicate that regardless of the delivery system (and the potency of the agent) a quantity of about a billion (10^9) times the effective dose of a substance is required for one attack under average meteorological conditions to cover an area within which a typical military unit might operate (0.5 to 2.0 km²)." The paper then defines five toxicity categories, their lower limits being set at 0 (taken as 1 microgram/man), 0.5, 10, 100 and 500 mg/man, and proposes that Schedule-2B chemicals should become subject to declaration once the quantity produced surpasses a billion times the lower limit of the category into which each one falls, with the exception of chemicals in the least toxic category, which would not need to be declared at all. {CD/CW/WP.358}

14 August The United States submits to the CD a detailed report on its third National Trial Inspection, which had been conducted during September 1990 at a chemical factory in Luling, Louisiana, owned by Monsanto Agricultural Co and making, among other products, the organophosphorus herbicide glyphosate. The trial was a practice challenge inspection that included assessment of production capability, possible presence of CW materials and simulation of host-state/observer-state roles. Its underlying scenario was taken to be an allegation that the factory was producing sarin, the challenge being issued on the entire site, but with the glyphosate facility as a primary concern. The inspection was conducted using a negotiated managed-access approach providing, as the report puts it, "for a gradual, increasingly intrusive inspection taking into account protection of sensitive proprietary information, while seeking increasing access to areas of the site relevant to the alleged violation." The report states that lessons learned from the inspection had influenced the development of the US position on challenge inspection [see 15 Jul]: "In particular, our experience suggested the need for an iterative approach to the determination of a final perimeter" within which the inspection would be concentrated. {CD/1100}

15 August The United States CD ambassador, Stephen Ledogar, speaking in the CD plenary, says his delegation believes that "broad consensus" is developing on the issue of the composition and decision-making process of the CWC Executive Council. He continues: "We believe there is broad support for an executive council of approximately 20 to 25 members. Selection would be based on a combination of geographical and industrial criteria.

Decision-making on substantive issues would be by a qualified majority."

His remarks are part of a review of issues still outstanding in the CWC negotiation, during which he also addresses the question of old stocks: "We urge the Governments that have problems with old and abandoned chemical weapons to provide technical information on the nature of the problems that exist. This could be done, for example, during the meeting of destruction experts that will be held this fall." {CD/PV.602}

15 August Germany submits to the CD a report on its sixth national trial inspection -- a practice challenge conducted in February at a large chemical complex in Frankfurt-Hoechst. The conclusion of the report is that, under the conditions tested, "it is quite possible to carry out appropriate inspections which have a decisive deterrent effect on potential infringers of the Convention and do not entail any unreasonable burden for the challenged party." {CD/1101}

Germany also submits a report on the multilateral practice challenge inspection it had hosted earlier in the year at one of its Luftwaffe bases [see 22-24 May]. The report concludes that the trial had "once again demonstrated that the challenge inspection regime envisaged in the Convention can fully meet requirements as a particularly important verification instrument of the CWC." {CD/1102}

15 August In the United States, new Commerce Department regulations enter into force embodying the catch-all and other export controls proposed in March as CBW (and missile) counterproliferation measures [see 7 Mar]. {WSJ 15 Aug; FedR 15 Aug pp. 40494ff}

15 August In Canada, the government's Biological and Chemical Defense Review Committee reports that the time spent in the Canadian military on CBW defense training "could be judged insufficient in light of the recently intensified threat." {DN 26}

15-22 August In Iraq, a UN team of 21 people lead by Colonel Jean-Paul Peroz of France conducts the Special Commission's second CW inspection [see 14 Jun]. The team visits several sites that had been associated with chemical weapons production, including Muthanna where construction of a chemdemil facility is under active Iraqi/UNSCOM consideration. Of the other production sites visited, all of them bombed during the Kuwait War, one had been for pesticide, another for CW-agent precursor, and the third had not been completed. A storage facility for 200 mustard-gas bombs at al-Habbaniyah airbase [see 18 Apr], 70 km west of Baghdad, is also inspected. Colonel Peroz tells reporters upon departure that the "Iraqis have cooperated very well" and "provided all maps of their installations." {Reuter in CN 16 Aug; IHT 22 Aug; AFP 22 Aug in FBIS-NES 26 Aug; AN 29 Aug}

16 August In Chile, President Patricio Aylwin and Defense Minister Patricio Rojas both issue public denials that Chile is developing or producing CBW weapons, as Argentine President Carlos Menem had just been reported as saying {Radio Chilena and Radio Cooperativa 16 Aug in FBIS-WEU 19 Aug}. The Defense Minister says, further: "We are working with the Chilean Foreign Ministry so that with Argentina and other countries -- perhaps Brazil and other countries -- an agreement could be reached in the near future banning the production and use of chemical, bacteriological and nuclear weapons in our continent" [see also 17 Feb

and 25 July, Peru].

18 August In Kuwait City, a 500-gallon tank apparently containing mustard gas has just been discovered beneath a building that had been occupied by Iraqi forces, according to a report in the London *Observer*. {Obs 18 Aug}

19 August In Geneva, the CD Ad Hoc Committee on Chemical Weapons receives a discussion paper about the CWC Annex on Chemicals resulting from Friend-of-the-Chair consultations conducted by Arend Meerburg of the Netherlands. The paper proposes changes both in the Schedules of Chemicals and in the Guidelines for scheduling chemicals, the former including some of the changes mooted during the second session [see 17 May], among them the idea of expressly exempting certain specific chemicals from schedules that include them generically. {CD/CW/WP.362}

19 August In Washington, a Heritage Foundation *Backgrounder* on CBW counterproliferation concludes: "[President] Bush should reverse his May 13 decision for America unilaterally to ban chemical weapons production -- even if other countries do not. Bush then should propose that the 1972 Convention on Bacteriological and Toxin Weapons be amended to allow the US and other select countries to retain modest biological arsenals." {*Backgrounder* 19 Aug}

21 August In Geneva the CD Ad Hoc Committee on Chemical Weapons receives for consideration a draft of its report to the CD on its work since January {CD/CW/WP.363}. As usual, Appendix I is the proposed new Rolling Text and Appendix II is a compilation of papers on matters that must later be reflected in the draft CWC but on which consensus is still emerging.

The Ad Hoc Committee finalizes and adopts the report six days later. Among its recommendations to the CD is that it should continue working on the CWC until the start of the 1992 CD session except during the periods 9-27 September, 14 October to 15 November and 23 December to 3 January. {CD/1108}

21 August The United States submits to the CD Ad Hoc Committee a working paper on the organization, staffing and cost estimates for the Technical Secretariat. The paper draws from some of the prior published studies. It envisages an organization of 1225 people, for which it estimates an annual operating cost of \$164 million. {CD/CW/WP.364}

23 August The United States submits to the CD a detailed report on its fourth National Trial Inspection, conducted as a practice "challenge inspection in a sensitive undeclared government facility" {CD/1107/Rev.1}. The trial had been run during January at Redstone Arsenal in Huntsville, Alabama, a location which in earlier years had been the site of Huntsville Arsenal (a former chemical-weapons factory) and the Gulf Chemical Warfare Depot, and which now contains the headquarters of the US Army Missile Command and several other activities.

31 August From Switzerland it is reported that the government's CHF1.77 billion military procurement program for 1992 has received parliamentary approval. The program provides CHF355 million (about \$245 million) for purchase of new NBC protective equipment, including 500,000 masks and 300,000 suits that will be purchased from Swiss companies -- the masks from Huger & Suhner, the suits from Saratoga. {MT 7/91; JDW 31 Aug}

Iraqi CBW Armament and the UN Special Commission

Saddam Hussein is evidently prepared to risk much in order to preserve the Iraqi nuclear-weapons program from total and irrevocable elimination under UN Security Council Resolution 687. The UN Special Commission (UNSCOM) charged with implementing the resolution has had to contend with all manner of subterfuge, deception, obstruction and threat in its work on nuclear weapons. What about Iraq's other weapons of mass destruction?

The answer seems to be that Iraq is now, since mid-May, cooperating fully with the UN Special Commission as regards CW weapons. Saddam Hussein appears content to abandon his poison gas. On BW, the picture is less clear. Here there are signs of cover-up and dissimulation -- but of a weapons program curtailed after it had barely started and which Iraqi authorities have been doing all they can to assure the world no longer exists and never again will.

That, at least, is what may plausibly be inferred from the information currently in the public domain. But there is much misinformation there too, and no doubt disinformation as well. UNSCOM is limiting disclosure of what its inspection teams have been finding and what their future plans are; quite rightly so at the present juncture. Not least for the future of CBW disarmament, a lot hinges on what Iraq turns out in fact to have been doing and on how the international community has been able to respond. In the meanwhile, however, false truths may take hold and do damage.

The News Chronology section of the *Bulletin* has reported, as far as possible, all that has been published on what the UNSCOM has learned about Iraqi CBW armament: see the entries for 18 April, 25 April, 16 May, 17 May, 9 June, 14 June, 30 July, 2 August, 7 August and 15-22 August. We are able here to add the following supplementary information. Although it has not previously been published with proper attribution, we are nonetheless convinced that it is reliable.

Iraqi Chemical Weapons

UNSCOM decided early on -- correctly, as it transpired -- that Iraq, in its communication to the United Nations of 18 April, had not declared all of its holdings of CW agents, nor all of its CW sites. Iraq was duly told of this and, on 16 May, submitted what it described as a 'comprehensive list.' Neither this list nor its associated clarifications have yet been published, but according to Iraq it was these disclosures and not detective work by UNSCOM inspectors which showed Iraq's CW capability to be larger than initially declared [see News Chronology, 30 July].

The first opportunity for checking what Iraq had declared came one month later with the dispatch of UNSCOM 2. This, the team assembled to conduct the first of UNSCOM's series of CW-related inspections, was tasked with the initial scouting mission to Muthanna State Establishment near Samarra, Iraq's principal CW facility, and was led by Peter Dunn of Australia [see News Chronology, 14 June]. It reported that none of the large amount of information it had gathered was in significant conflict with the declaration by Iraq for the site.

UNSCOM 2 confirmed earlier suppositions about the agent production routes used at Muthanna. Mustard gas had been produced from thiodiglycol and thionyl chloride. Tabun had been made by the original German route, namely from phosphoryl chloride via N,N-dimethylphosphoramidic dichloride. Sarin had been made by the route phosphorus trichloride to trimethyl phosphite to dimethyl methylphosphonate to methylphosphonyl dichloride, from which the immediate precursor methylphosphonyl difluoride (DF) was obtained using hydrogen fluoride; where the final product sought was sarin/GF mixture, the DF was reacted with a mixture of isopropanol and cyclohexanol. Both the sarin and the sarin/GF mixture had been produced as undistilled product, using triethylamine as stabilizer. Agent CS had also been produced at Muthanna, Iraqi authorities stating that it had been loaded into mortar bombs.

The second CW-related UNSCOM inspection, led by Jean-Paul Peroz of France and visiting several sites, took place two months later. It, too, reported good cooperation from Iraq. It had been preceded during 11-14

August by a small fact-finding mission sent to explore Iraq's capabilities for destroying its own CW weapons in the light of an analysis that had just been conducted by UNSCOM's Expert Panel on CW Destruction. Iraq told this fact-finding mission that it had never had a fatal accident during the whole of its CW-weapons program, including the limited demilitarization conducted at the end of the war with Iran; it had about 200 personnel, thoroughly trained and experienced in handling CW agents, available for UN chemdemil work. The mission recommended that Iraq's offer to help in this work should be given serious consideration.

The UNSCOM mission was also told that the 336 binary sarin bombs at Al Walid declared in the 18 April communication were filled with alcohol only, and that, of the *Al-Hussein* missile warheads declared to be in storage at Dujayl, 14 were binary warheads, again filled with alcohol only. This information contrasted with what UNSCOM had earlier understood, and publicly announced, about what Iraq meant by 'binary sarin' -- namely that it denoted a chemical munition containing a mixture of sarin and GF [see News Chronology, 14 June].

Iraqi Biological Weapons

The Iraqi communication to the UN of 18 April had declared that "Iraq does not possess any biological weapons or related devices." Western commentators at once expressed skepticism, as well they might in view of the lengths to which US and other Coalition forces had gone to protect themselves against anthrax and botulin. The 18 April communication also announced that Iraq had joined the Biological Weapons Convention, so UNSCOM asked Iraq to furnish the same information about its biological programs as the UN had been receiving from BWC states-parties under the 1986/7 confidence-building agreement. Iraq acceded. In regard to the facility which Western news media had been reporting as the central Iraqi BW research establishment, at Salman Pak, Iraq notified the Special Commission that the purposes of the facility were the inspection and analysis of foods and liquids for human consumption, and the identification of chemical and biological contamination by laboratory diagnoses.

In early August, the Salman site became the object of UNSCOM 7, the first BW-related inspection, led by David Kelly of the UK. The team was told upon arrival that, since mid 1986, there had in fact been BW-related work at the facility but that the work had ceased in Autumn 1990, all BW agents then being destroyed by autoclaving. The team subsequently reported to UNSCOM that an aerosol chamber had been built at Salman before 1986 (probably 1983) in a building constructed for the purpose, and that botulin toxin had been deployed in studies in this chamber; and it reported, too, that it had been shown the crushed remains of the chamber on a garbage dump outside Baghdad. Iraqi authorities said that a 150-litre fermenter, purchased by SEPP in 1985 and installed at Salman the following year, had also been removed from the site. And the team had found on-site a purpose-built, hardened, stand-alone microbiological cold store, admirably suited, it reported, for the bulk storage of microbes. The assessment of the team was that the capability had existed at Salman to produce BW weapons on a limited scale.

These and other such observations (noted in the News Chronology) led the team to put forward the following conclusion. After Iraq had taken the decision to terminate BW work at the Salman site, there had been a high-level decision to deny that the program had existed and to remove all evidence of it from the site. Subsequently, as events made this position untenable, there was a decision to admit the existence of the program at Salman. Finally there was a decision to eliminate all evidence that could reveal to the UNSCOM inspection team the progress and size of the program.

Iraqi authorities handed over to the team as it was leaving a collection of bacterial seed stocks -- a gesture clearly meant to be taken as a token of intent to renounce BW armament. From the collection, the team concluded that Iraq possessed the following biological warfare agents: *Bacillus anthracis*, *Brucella abortus*, *Brucella melitensis*, *Francisella tularensis*, *Clostridium botulinum* strains which individually and independently produce botulinum toxins type A, E and F, *Clostridium tetani* which produces tetanus toxin, and *Clostridium perfringens* which produces a range of toxins, including epsilon toxin.

--The Editors

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Forthcoming Events

* In Geneva during 7-11 October, the CD will hold a conference of technical experts on the destruction of chemical weapons.

* In Frankfurt during 24-27 October, the Peace Research and European Security Studies (AFES-PRESS) center will hold a seminar on "Controlling Military Research & Development and Exports of Dual Use Technologies as a Problem of Disarmament and Arms Control Policy in the 1990s." For more information, contact Hans Günter Brauch (phone 49-6261-12912, FAX 49-6261-15695).

* The US Army Chemical Research, Development and Engineering Center will hold a Scientific Conference on Chemical Defense Research on 19-22 November at the Edgewood Area Con

ference Center at Aberdeen Proving Ground, Maryland.

* In Washington, the AAAS will hold its Sixth Annual colloquium on science and security. Among the panels will be "Verifying Multilateral and Regional Arms Control Agreements" and "Prospects for Regional Cooperation in the Middle East," both on 22 November. Call 202-326-6490 for more information.

* In Rome, on 22-23 November the Institute for International Affairs will host a conference on "Verification of Chemical Weapons Disarmament and Chemical Weapons Production Facilities: Strategic and Legal Problems."

* In Brussels, the Centrum voor Polemologie of the Vrije Univer

siteit Brussels, and the Groupe de Recherche et d'Information sur la Paix (GRIP) will hold their 3rd Annual Conference on Chemical Warfare, entitled "The Second Gulf War and the CBW Threat" during 29-30 November. The contact persons are: Jean Pascal Zanders at VUB (phone 32-2-641-2028, FAX 32-2-641-2282) and Eric Remacle at GRIP (phone 32-2-241-8096, FAX 32-2-241-1933).

* The American Defense Preparedness Association, in cooperation with the US Army Chemical School, will convene a symposium at the School in Anniston, Alabama during 3-5 December on the theme "After the Treaty -- an Era of Transition." For more information contact Ms. Lynne Daley, 2101 Wilson Boulevard, Suite 400, Arlington, VA 22201-3061.

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