

# Iraq Biological Chronology

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*Last update: October 2008*

**As of October 2008, this chronology is no longer being updated.  
For current developments, please see the Iraq Biological Overview.**

## 2008-2004

### 18-22 August 2008

An Iraqi delegation of three attends the Biological Weapons Convention (BWC) Meeting of Experts in Geneva, Switzerland.

—List of Participants BWC/MSP/2008/MX/INF.5, 22 August 2008, p. 15, [www.unog.ch](http://www.unog.ch).

### 10-14 December 2007

An Iraqi delegation attends the fourth Meeting of the States Parties (MSP) to the BWC in Geneva, Switzerland.

—List of Participants BWC/MSP/2007/INF 1, 14 December 2007, p. 14, [www.opbw.org](http://www.opbw.org).

### 20-24 August 2007

An Iraqi delegation of three attends the Biological Weapons Convention Meeting of Experts in Geneva, Switzerland.

—List of Participants BWC/MSP/2007/MX/INF 3, 24 August 2007, p. 13, [www.opbw.org](http://www.opbw.org).

### 28 June 2007

The UN Security Council adopts resolution 1762 under which it "decides to terminate immediately the mandates of UNMOVIC and the IAEA under the relevant resolutions."

—S/RES/1762 (2007), 29 June 2007, p. 2, [www.un.org](http://www.un.org).

### 20 November - 8 December 2006

Five Iraqi representatives attend the Sixth Review Conference of the Biological and Toxin Weapons Convention (BWC) in Geneva, Switzerland.

—List of Participants, BWC/CONF.VI/INF.8, 7 December 2006, p. 18-19, [www.opbw.org](http://www.opbw.org).

### 30 to 31 October 2006

The Iraqi government participates in the twenty-fifth Proliferation Security Initiative (PSI) interdiction exercise which takes place in international waters off the north-eastern coast of Bahrain. [Iraqi participation does not appear to include the deployment of military assets and may to be limited to an observation role.]

—*The CBW Conventions Bulletin*, No. 74 (December 2006), p. 61-62.

### 8 September 2006

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The US Select Committee on Intelligence releases Postwar Findings About Iraq's WMD Programs and Links to Terrorism and How They Compare with Pre-War Assessments. Regarding Iraq's alleged biological weapons programs this preliminary report states that "[p]ostwar findings do not support the 2002 National Intelligence Estimate (NIE) assessment [see 1 Oct 02 and 18 Jul 03] that 'Iraq has biological weapons' and that 'all key aspects of Iraq's offensive biological weapons (BW) program are larger and more advanced than before the Gulf war' [or] that Iraq possessed, or ever developed, mobile facilities for producing biological warfare (BW) agents..." The report did note however that "[a]lthough Iraq no longer had a large scale BW production capability after 1996, Iraq did retain an inherent dual-use capability ... and that Iraq could have re-established an "elementary" BW program within a few weeks to months, but would have faced great difficulty in re-establishing an effective BW agent production capability.

—Postwar Findings About Iraq's WMD Programs and Links to Terrorism and How They Compare with Prewar Assessments, Senate Select Committee on Intelligence, Senate Report 109-331, 8 September 2006, p. 54-55, [www.fas.org](http://www.fas.org).

Regarding pre-war claims that Iraq had been providing CBW training to al-Qa'ida operatives the report concludes that "No postwar information has been found that indicates CBW training occurred and the detainee who provided the key prewar reporting about this training recanted his claims after the war."

—Postwar Findings About Iraq's WMD Programs and Links to Terrorism and How They Compare with Prewar Assessments, Senate Select Committee on Intelligence, Senate Report 109-331, 8 September 2006, p. 106, [www.fas.org](http://www.fas.org).

#### **26-28 April 2006**

Three Iraqi representatives attend the meeting of the Preparatory Committee for the Sixth BWC Review Conference in Geneva.

—*List of Participants, BWC/CONF.VI/PC/INF.2*, 28 April 2006, p. 10, [www.opbw.org](http://www.opbw.org).

#### **9 March 2006**

Speaking at the Middle East Institute in Washington DC, former CIA official, Mr. Paul Pillar, speculates that Iraq will be seeking WMD again within the next five to ten years. He explains this as a necessary reaction to threats posed to Iraqi security by regional neighbors possessing or seeking WMD themselves.

—*The CBW Conventions Bulletin*, No 72+73 (September 2006), p. 13.

#### **26 January 2006**

Georges Sada, formerly second in command of the Iraqi Air Force, claims that in June 2002 Iraq transported WMD to Syria aboard several refitted commercial jets, under the pretence of conducting a humanitarian mission for flood victims. He says that two commercial jets were converted to cargo jets, in order to carry raw materials and equipment related to WMD projects. The passenger seats, galleys, toilets and storage compartments were removed and new flooring was installed. Hundreds of tons of chemicals were reportedly included in the cargo shipments. Sada says he obtained the information from two Iraq Airways captains who were reportedly flying the sorties. The allegations are included in Sada's newly published book, "Saddam's Secrets" which he is promoting in the United States.

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—Ira Stoll, "Iraq's WMD Secreted in Syria, Sada Says," *The New York Sun*, 26 January 2006, <http://web.lexis-nexis.com>.

#### **17 December 2005**

US forces release biological weapons scientists Huda Salih Mahdi Ammash and Rihab Taha from custody, after more than three years in detention, on the grounds that they no longer pose a security threat.

—*The CBW Conventions Bulletin*, No 71 (May 2006), p. 26.

#### **15 October 2005**

The permanent Constitution of Iraq is ratified by popular referendum. Article 9, paragraph 1 (e), provides that "the Iraqi Government shall respect and implement Iraq's international obligations regarding the non-proliferation, non-development, non-production, and non-use of nuclear, chemical and biological weapons and associated equipment, materiel, technologies and delivery systems for use in the development, manufacture, production and use of such weapons."

—*Letter dated 5 February 2006 from the Permanent Representative of Iraq to the United Nations addressed to the Chairman of the Committee, UN Document S/AC.44/2004/(02)/116/Add.1*, 10 February 2006, p. 2, <http://daccessdds.un.org>.

#### **27 April 2005**

The Iraq Survey Group (ISG) publicly releases the *Addendums to the Comprehensive Report of the Special Advisors to the DCI on Iraq's WMD*. On the question of purported transfers of Iraqi WMD to Syria the report says: "There was evidence of a discussion of possible WMD collaboration initiated by a Syrian security officer, and ISG received information about movement of material out of Iraq, including the possibility that WMD was involved. In the judgment of the working group, these reports were sufficiently credible to merit further investigation. ISG was unable to complete its investigation and it is unable to rule out the possibility that WMD was evacuated to Syria before the war. It should be noted that no information from debriefing of Iraqis in custody supports this possibility. ISG found no senior policy, program, or intelligence officials who admitted any direct knowledge of such movement of WMD. Indeed, they uniformly denied any knowledge of residual WMD that could have been secreted to Syria." The report concluded that "[b]ased on the evidence available at present, ISG judged that it was unlikely that an official transfer of WMD material from Iraq to Syria took place. However, ISG was unable to rule out unofficial movement of limited WMD-related materials."

—*Addendums to the Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD* (Duelfer Report), March 2005, p. 1, [www.cia.gov](http://www.cia.gov); Dana Priest, "Report finds no evidence Syria hid Iraqi arms," *Washington Post*, 26 April 2005; Katherine Shrader, "Weapons inspector ends WMD search in Iraq," Associated Press, 26 April 2005; Rowan Scarborough, "CIA can't rule out WMD move to Syria," *Washington Times*, 27 April 2005, [www.washingtontimes.com](http://www.washingtontimes.com); "Puncturing another weapons myth," *New York Times*, 30 April 2005, p. A12; Anders Strindberg, "Report finds no evidence of WMD transfers to Syria," *Jane's Intelligence Review*, 1 June 2005.

#### **28 February 2005**

Arab news sources allege that U.S. forces have used "bombs which gave off apple-scented poisonous gas" in the course of their assault on Iraqi insurgent forces in the city of Fallujah. A representative of the Iraqi Ministry of

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Health is quoted as saying that U.S. forces used inter alia "mustard gas, nerve gas, and other burning chemicals."  
—*The CBW Conventions Bulletin*, No. 68 (June 2005), p. 26.

#### **17 January 2005**

US Intelligence and congressional officials say they have not seen any evidence that WMD components or equipment were moved from Iraq to Syria, Jordan or elsewhere before or after the March 2003 US invasion. In a separate statement Charles Duelfer, head of the Iraq Survey Group (ISG) says: "What I can tell you is that I believe we know a lot of materials left Iraq and went to Syria. There was certainly a lot of traffic across the border points. But whether in fact in any of these trucks there was WMD-related materials, I cannot say."

—Katherine P. Shrader, "US intelligence found no evidence WMD moved from Iraq," Associated Press, 17 January 2005, <http://web.lexis-nexis.com>.

#### **14 January 2005**

White House spokesman, Scott McClellan, rules out the possibility that Iraqi WMD may have been moved to Syria.  
—Brian Knowlton, "Search for banned weapons in Iraq ends quietly," *International Herald Tribune*, 14 January 2005, p. 3.

#### **13 October 2004**

UNMOVIC remains concerned about the destruction of WMD sites and facilities in Iraq and the subsequent disappearance of dual-use equipment. It recommends that Iraq set up an inventory system to track the location and condition of such equipment and indicates that UNMOVIC is ready to assist in this effort. Iraq had no immediate comment on UNMOVIC's concerns, but the US State Department, which has been helping Iraq set up methods to restrict the movement of these materials, said that Iraq has put new export controls in place to prevent WMD materials or technology from leaving Iraq.

—Robert McMahon, "Iraq: UN Mission hopes for tighter controls on Iraqi 'dual-use' sites," Radio Free Europe/Radio Liberty, 13 October 2004.

#### **8 October 2004**

Charles Duelfer, head of the Iraq Survey Group is quoted responding to a question about the possibility that Iraqi WMD were transferred out of Iraq prior to March 2003. He says: "We cannot yet definitively say whether or not WMD materials were transferred out of Iraq before the war. Neither can we definitely answer some questions about possible retained stocks though, as I say, it is my judgment that retained stocks did not exist." [By excluding the possibility of retained stocks of WMD, or new production prior to March 2003 Duelfer also appears to exclude the possibility that WMD were transferred to Syria or any other country.]

—Janine Zacharia, "Bush concedes Iraq had no WMDs," *Jerusalem Post*, 8 October 2004, p. 1, <http://web.lexis-nexis.com>.

#### **30 September 2004**

The Iraq Survey Group releases its final report on Iraq's Weapons of Mass Destruction. The report finds Saddam intended to resume WMD programs after UN sanctions were lifted. According to the ISG, Iraq probably destroyed biological weapons stockpiles in 1991 and 1992, but continued biological weapons research until the mid 1990s.

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Research included assassination uses of biological weapons and human testing. In 1996, Iraqi BW facilities and equipment were destroyed under UN supervision. Iraq could have quickly re-established small scale BW programs within a few weeks through the dual-use civilian facilities in the country. However, the ISG found no evidence that Iraq was pursuing this option. In addition, the ISG found no evidence that Iraq had established any mobile BW production facilities.

—*Comprehensive report of the Special Advisor to the DCI on Iraq's WMD*, Central Intelligence Agency, 30 September 2004, [www.cia.gov](http://www.cia.gov).

### **23 September 2004**

Abu Musab al-Zarqawi and his followers threaten to behead a British contractor, Ken Bigley, unless Iraqi female prisoners are released. This demand focuses attention on two imprisoned women scientists: Dr. Rihab Taha, also known as "Dr. Germ", who was in charge of an Iraqi facility that weaponized anthrax, botulinum toxin, and aflatoxin and believed to have designed the Iraqi biological weapons program; and Huda Salih Mahd Ammash, also known as "Mrs. Anthrax" and "Chemical Sally", who was the only woman to serve on Saddam Hussein's Revolutionary Command Council. Although the Iraqi Ministry of Justice is not opposed to releasing these women, the US authorities are still refusing to release them.

—"Hostage crisis: US detaining Iraq scientists despite failure to find WMD," *Independent* (London), 23 September 2004, p. 4; "Scientists had key roles in Saddam's laboratories," *Irish Times*, 23 September 2004.

### **27 August 2004**

UNMOVIC reports that significant amounts of Iraqi WMD related items have been exported from Iraq as scrap metal and are showing up in scrapyards in many countries, most notably Jordan and the Netherlands. These items include SA-2 missile engines and chemical dual-use items that still had UN tags attached to them. UNMOVIC estimates that the export of these items began in June 2003 and continued until June 2004. Through the use of satellite imagery, UNMOVIC has determined that several sites previously monitored by them before Operation Iraqi Freedom have been looted and razed. With the exception of the items that have turned up in scrapyards, the status of the dual-use equipment and materials contained at these sites is unknown.

UNMOVIC comments on the likelihood of biological munitions being found in Iraq by coalition forces. UNMOVIC states that biological munitions were produced on a limited scale and were supposedly destroyed unilaterally by Iraq. However, excavations by the UN to account for this destruction were interrupted by the UNMOVIC withdrawal. UNMOVIC judges it unlikely that anything more than fragments of biological munitions will be found and states that such fragments should not contain any live biological agent.

UNMOVIC issues an assessment of Iraq's remotely piloted and unmanned aerial vehicle (RPV/UAV) programs based on inspections conducted in the 1990s and 2003. They state that although they had concerns about the ability of some of the RPV/UAVs to fly beyond the allowed range, the vehicles were unable to effectively deliver chemical or biological agents. While Iraq's RPV/UAVs technically could have been modified to carry small amounts of chemical or biological agents, the quantities would not have been large enough to make an effective military weapon. In addition, no technical evidence was ever found by UNMOVIC indicating that the Iraqis had tried to develop such modifications.

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—*Eighteenth quarterly report on the activities of the United Nations Monitoring, Verification and Inspection Commission submitted in accordance with paragraph 12 of Security Council resolution 1284 (1999)*, UN document S/2004/693, 27 August 2004, [www.un.org](http://www.un.org).

#### **14 July 2004**

The Butler Report is issued in Britain. This report mostly reviews the reliability and quality of intelligence provided to the UK government prior to the 2003 war with Iraq. The report also says that Iraq did not have significant stocks of chemical and biological weapons or developed plans to use such weapons.

—*Review of Intelligence on Weapons of Mass Destruction*, House of Commons document number HC 898, 14 July 2004, [www.officialdocuments.co.uk](http://www.officialdocuments.co.uk).

#### **9 July 2004**

The Butler report, which will be published next week, will say that the September 2002 dossier of the Joint Intelligence Committee in Britain omitted several caveats qualifying British intelligence on Iraq. For example, the dossier claimed that Iraq could deploy chemical or biological weapons within 45 minutes, but did not mention that this claim only referred to short range munitions and came from only one source.

—"UK Butler Inquiry 'to finger' Foreign Secretary Straw over Iraq War legality," Agence France-Presse, FBIS EUP20040709000353, 9 July 2004.

#### **28 May 2004**

UNMOVIC comments on the unclassified portion of Charles Duelfer's testimony to the US Congress on 30 March 2004, saying that both UNMOVIC and UNSCOM repeatedly inspected the Tuwaittha Agricultural and Biological Research Center and categorized it as being subject to intensive monitoring because of the dual-use nature of the facility and its research. UNMOVIC also reports that Iraq purchased both biological and chemical dual-use equipment between 1999 and 2002, but there is no evidence that it was used in prohibited weapons programs. Most of the materials bought were declared to UN monitors properly. Seventeenth quarterly report on the activities of the United Nations Monitoring, Verification and Inspection Commission submitted in accordance with paragraph 12 of Security Council resolution 1284 (1999), UN document S/2004/435, 28 May 2004, [www.un.org](http://www.un.org).

#### **30 March 2004**

Senator Carl Levin issues a statement that the publicly released testimony of Charles Duelfer to Congress on 30 March 2004 creates a misleading impression that there is WMD in Iraq, while the classified testimony casts doubts on that conclusion.

—Senator Carl Levin, Press Release, 30 March 2004, "Statement of Senator Carl Levin relating to public release of testimony of Mr. Charles Duelfer DCI's Special Advisor for WMD in Iraq", [www.nci.org](http://www.nci.org).

#### **30 March 2004**

The CIA releases the unclassified portion of testimony by the new head of the Iraq Survey Group (ISG), Charles Duelfer, before the US Congress. Regarding biological weapons, Duelfer says that the ISG has new information on Iraq's dual-use facilities and research projects and their potential to be quickly converted to weapons programs. He states that Iraq had such facilities and also had plans to build new facilities. He cites the Tuwaittha Agricultural and

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Biological Research Center, as an example of a biological dual-use facility and research center. In particular, this facility did research on *Bacillus thuringiensis*, which is a commercial biopesticide that can also be used as a surrogate for anthrax for production and weapons development.

—Testimony to the US Congress by Mr. Charles Duelfer, Director of Central Intelligence Special Advisor for Strategy regarding Iraqi Weapons of Mass Destruction (WMD) Programs, 30 March 2004, [www.cia.gov](http://www.cia.gov).

#### **27 February 2004**

UNMOVIC releases a summary of Iraqi chemical and biological munitions. Iraq declared and subsequently destroyed R-400 bombs filled with biological agent. Some were destroyed unilaterally and others under Special Commission supervision.

—*Sixteenth quarterly report on the activities of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)*, UN document S/2004/160, 27 February 2004, [www.un.org](http://www.un.org).

#### **25 January 2004**

There are suspicions that the Iraq's CBW materials may have been moved to Syria. "We are not talking about a large stockpile of weapons," he said. "But we know from some of the interrogations of former Iraqi officials that a lot of material went to Syria before the war, including some components of Saddam's WMD programme. Precisely what went to Syria, and what has happened to it, is a major issue that needs to be resolved." There is no physical evidence to support this contention.

—"Saddam's WMD hidden in Syria, says Iraq survey chief," *The Telegraph* (UK), 25 January 2004, [www.telegraph.co.uk](http://www.telegraph.co.uk).

#### **23 January 2004**

Dr. David Kay resigns his positions from the Iraq Survey Group because he came to the conclusion that WMD would not be found in Iraq: "I don't think they existed. What everyone was talking about is stockpiles produced after the end of the last Gulf War and I don't think there was a large-scale production programme in the 90s." David Kay criticized the intelligence that led to the war in testimony to the Senate Armed Services Committee, saying "we were all wrong and that is most disturbing." Kay does state, even if Iraq did not have weapons stockpiles, this does not mean that nation wasn't dangerous.

—"US Steps Back from WMD Claims," *BBC News*, 24 January 2004, <http://news.bbc.co.uk>; "Admit WMD mistake, survey chief tells Bush" *The Guardian* (London), 3 March 2004, [www.guardian.co.uk](http://www.guardian.co.uk).

#### **26 November 2003**

UNMOVIC publishes a historical review of the destruction of proscribed biological weapons materials and agents since 1991. The report details Iraq's initial declarations regarding biological weapons research in 1991, further declarations by Iraq in 1995 admitting bulk production of biological agents, Iraq's claims of unilateral destruction of biological weapons and agents in 1991, destruction of biological weapons and materials under Special Commission supervision in 1996, destruction of biological materials under UNMOVIC supervision in 2003, and the status of biological weapons facilities after 1996.

—*Fifteenth quarterly report on the activities of the United Nations Monitoring, Verification and Inspection*

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Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999), UN document S/2003/1135, 26 November 2003, [www.un.org](http://www.un.org).

### **10 October 2003**

The only evidence of biological weapons recovered in Iraq by the Iraq Survey Group is a vial containing *Clostridium botulinum* Type B from a scientist's refrigerator. "Kay said the vial had been stored for safekeeping in an Iraqi scientist's refrigerator since 1993."

[Note: *C. botulinum* Type A is the most virulent type used for in weapons programs. The toxin generated by Type B is much less toxic. *C. botulinum* is ubiquitous. It is widely distributed in soil and marine sediments throughout the world. It is also found in the intestinal tract of animals. The organism can be isolated occasionally from many foods because of its widespread occurrence in the environment and is usually associated with research on endemic public health issues in the Middle East.]

—"Revelations Cast Doubt on Iraq Find," *The Guardian* (UK), 10 October 2003, [www.un.org](http://www.un.org).

### **2 October 2003**

Dr. David Kay delivers to Congress a statement on the first six months of progress of the Iraq Survey Group. He reports that much has been found concerning the intent of Saddam to restart his illicit programs. He also reports that stockpiles of biological weapons have not been found.

—"Statement by David Kay on the Interim Progress Report on the Activities of the Iraq Survey Group", Before the House Permanent Select Committee on Intelligence, the House Committee on Appropriations, Subcommittee on Defense and the Senate Select Committee on Intelligence, 2 October 2003, [www.un.org](http://www.un.org).

### **18 July 2003**

Declassified excerpts from the October 2002 National Intelligence Estimate are released by the White House. These excerpts contain forty "distinct caveats or conditions on the intelligence judgment" which were usually dropped in other official publications and statements.

—Joseph Cirincione, Jessica T. Mathews, George Perkovich, with Alexis Orton, *Weapons of Mass Destruction in Iraq: Evidence and Implications*, (Washington DC: Carnegie Endowment for International Peace, January 2004), p. 17.

### **30 June 2003**

Dr. Hans Blix ends his appointment as Executive Chairman of UNMOVIC. Demetrius Perricos is appointed Acting Executive Chairman.

—*Fourteenth quarterly report on the activities of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)*, UN document S/2003/844, 28 August 2003, [www.un.org](http://www.un.org).

### **June 2003**

The Iraq Survey Group (ISG) is created to search for WMD in Iraq. It is composed of approximately 1,400 WMD specialists and is led by David Kay, a former top UN weapons inspector.

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—James Risen, "After the war: Illegal weapons; US asks ex-UN inspector to advise on arms search," *New York Times*, 11 June 2003, p. A18.

### **30 May 2003**

UNMOVIC reports on the findings of its inspections in Iraq. Highlights of this report include a destruction study of R-400 bombs, an anthrax destruction study, mobile biological weapons production laboratories, and destruction of biological material. UNMOVIC inspected the Al Azziziyah firing range, where Iraq claimed to have unilaterally destroyed 157 R-400 bombs filled with biological agent. To prove the destruction, Iraq excavated and recovered the bombs and pieces of the bombs. The number of base plates, markings on fragments, and level of corrosion were all consistent with Iraq's claims. Chemical and biological sampling of two intact filled bombs showed the presence of *B. anthracis* and also high levels of manganese and formic acid, which are consistent with Iraq's claims of chemical inactivation with potassium permanganate and formaldehyde. Iraq submitted an anthrax destruction study report to UNMOVIC to prove its previous unilateral destruction of anthrax stocks at Al Hakam in 1991. However, the study could not prove the amount of anthrax that had been dumped. UNMOVIC inspected several suspected mobile biological weapons production facilities in Iraq. Inspections were made based on intelligence provided by other governments. Several sites had seed-processing equipment that looks similar to biological weapons production equipment, but no evidence of mobile biological weapons production activity was found. UNMOVIC requested and received declarations and pictures from Iraq on all its mobile facilities. These facilities were then randomly tested by UNMOVIC during regular inspections, but no evidence of biological weapons production was found. In addition to inspections, 244.6 kilograms of growth media and 40 vials of expired toxin standards was destroyed under UNMOVIC observation.

—*Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)*, UN document S/2003/580, 30 May 2003, [www.un.org](http://www.un.org).

### **28 May 2003**

A joint CIA/DIA report on Iraqi mobile biological warfare plants outlines the capture and analysis of suspected mobile production trailers. The trailers are suspected to be part of a two or three trailer production unit of biological material or hydrogen, making them suitable for possible use in Iraq's biological or missile programs. [Note: the trailers were later determined to be for hydrogen production for balloons.]

—"Iraqi Mobile Biological Warfare Agent Production Plants", CIA, DIA, 28 May 2003.

### **19-20 March 2003**

US and Coalition forces commence Operation Iraqi Freedom, a military invasion of Iraq, on 20 March at 4 am in Baghdad (8 pm on 19 March in Washington, DC).

—"The war begins," *Economist*, 20 March 2003, [www.un.org](http://www.un.org).

### **18 March 2003**

UNMOVIC inspectors withdraw from Iraq following a notification from the US administration of the imminent invasion of Iraq.

—*Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and*

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*Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)*, UN document S/2003/580, 30 May 2003, [www.un.org](http://www.un.org).

### **16 March 2003**

The Iraqi weapons declaration to the United Nations names the American Type Culture Collection of Manassas, VA and the Pasteur Institute in Paris as the sources of all foreign germ samples used to create Iraqi biological weapons. According to the document, these two biological supply houses shipped 17 types of biological agents to Iraq in the 1980s, among which were anthrax and bacteria needed to make botulinum toxin.

—Philip Shenon, "Iraq likes germs for weapons to US and France," *New York Times*, 16 March 2003, p. 18.

### **16 March 2003**

UNMOVIC inspectors withdraw from Iraq following a notification from U.S. administration.

### **7 March 2003**

Hans Blix reports to the U.N. Security council on the progress of the UNMOVIC disarmament mission in Iraq. He reports that there was initial period of reluctant cooperation by the Iraqis but that there now seemed to be an acceleration of cooperative initiatives including the acceptance of disarmament of its al-Samoud 2 missiles.

—"United Nations Weapons Inspectors Report to the U.N. Security Council on Progress in the Disarmament of Iraq", United Nations, 7 March 2003.

### **6 March 2003**

An UNMOVIC working document reports on the clusters of remaining unresolved biological disarmament issues including those related to *B. anthrax*, botulinum toxin, mycotoxins including aflatoxin and trichothecenes, wheat cover smut, *Clostridium perfringens*, ricin, undeclared BW agents, drying of BW agents, bacterial BW agent production, genetic engineering, viral research, and BW agent stimulants.

—"Unresolved Disarmament Issues: Iraq's Proscribed Weapons Programmes," UNMOVIC Working Document, 6 March 2003, pp. 95-131.

### **28 February 2003**

After three months of inspections, UNMOVIC observes that Iraq has been very helpful in matters relating to inspection "process", but has been less forthcoming in substantive matters and notes that Iraq could have made greater efforts to either find and produce remaining WMD stockpiles or show credible evidence of their destruction.

—*Twelfth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)*, UN document S/2003/232, 28 February 2003, [www.un.org](http://www.un.org).

### **February 24, 2003**

Dan Rather interviews Saddam Hussayn concerning the many aspects of Iraq's alleged illicit weapons programs and the impending military confrontation. He denies that Iraq is in breach of Security Council resolutions.

—Dan Rather Interview with President Saddam Hussayn, 24 February 2003.

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### **19-20 February 2003**

The Independent reports on 19 February that three giant cargo ships, which are suspected of carrying Iraqi weapons of mass destruction, are being tracked by US and British intelligence. However, the following day, a report by The Guardian says that the US Navy is boarding approximately six ships per day in search of Iraqi WMD, but so far has only found small amounts of drugs and unauthorized guns. Also in the report, David Osler, an editor of Lloyd's List maritime journal, notes that chemical weapons do not take up much space and safe storage of missiles on a commercial ship would require large-scale adaptations.

—"Iraq Crisis: Three mystery ships are tracked over suspected weapons' cargo," *Independent* (London), 19 February 2003; "Ships boarded in search for smuggled weapons," *Guardian* (London), 20 February 2003.

### **5 February 2003**

U.S. Secretary of State Colin Powell presents intelligence on Iraq's weapons programs to the U.N. Security Council intelligence, including alleged mobile biological production facilities and signals intelligence.

—White House Press Release, "U.S. Secretary of State Colin Powell Addresses the U.N. Security Council," 5 February 2003.

### **7 December 2002**

Iraq provides UNMOVIC with an updated full and complete declaration as required by Resolution 1441 describing its proscribed weapons programs and other biological programs. The declaration consists of more than 12,000 pages, but with the exception of non-weapons related biological declarations and missile development declarations, UNMOVIC finds very little new information.

—*Twelfth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)*, UN document S/2003/232, 28 February 2003, [www.un.org](http://www.un.org).

### **27 November 2002**

UNMOVIC begins inspections in Iraq.

—*Twelfth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)*, UN document S/2003/232, 28 February 2003, [www.un.org](http://www.un.org).

### **November 2002**

U.N. inspectors, as part of UNMOVIC, return to Iraq.

### **16 September 2002**

Iraq announces that it will allow the return of UN inspectors without conditions.

—*Eleventh quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)*, UN document S/2002/1303, 27 November 2002, [www.un.org](http://www.un.org).

### **12 September 2002**

President Bush addresses the U.N. General Assembly, expressing that "if Iraq's regime defies us again, the world

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must move deliberately...the Security Council resolutions will be enforced...or action will be unavoidable."

—"Presidents Remarks at the United Nations", Office of the Press Secretary, 12 September 2002.

### **29 January 2002**

President Bush lists Iraq in his "Axis-of-Evil" State of the Union Address. He also says that "the Iraqi regime has plotted to develop anthrax, and nerve gas, and nuclear weapons for over a decade."

—The President's State of the Union Address, The United States Capitol, Washington, D.C. Office of the Press Secretary, 29 January 2002.

### **2002**

A CIA analysis places Iraq's anthrax-bacteria supply at 2,650 gallons.

—Graham T. Allison, "The View From Baghdad", *Washington Post*, 31 July 2002, p. 19.

### **2001**

Adnan Ihsan Saïid al-Haaidiri, an Iraqi defector who was involved in the construction of "clean rooms", claims that many small laboratories were being carefully constructed.

—Joby Warrick, "In Assessing Iraq's Arsenal, the 'Reality is Uncertainty'," *Washington Post*, 31 July 2002, p. 1.

### **April 2001**

In a letter to U.N. Secretary-General Kofi Annan, the Iraqi Ambassador to the U.N. Mohammed al-Duri, seeks approval for financing to refurbish a laboratory for the manufacture of vaccines for Foot and Mouth disease, which was previously destroyed by UNSCOM inspectors. The financing would be taken out of the revenue from the U.N. oil-for-food program.

—"Iraq Seeks Help Making Foot-and-Mouth Vaccine," *The Nando Times*, 8 April 2001.

### **Early March 2001**

A classified report by UNMOVIC, which is based on analysis of information inherited from UNSCOM, states that "...the production of Agent B (*B. anthracis* spores) could be much greater than stated and, had such production taken place, the remaining quantities would still retain significant activity given the stability of this agent."

—"Missiles and Viruses Still Troubling U.N. UNMOVIC Report," *Financial Times*, 2 March 2001, p. 11.

### **28 February 2001**

U.S. officials state that Iraq and Sudan engaged in a joint effort to develop chemical and biological weapons in Sudan. It is also reported that Iraq has exported technology and expertise in non-conventional weapons to Libya and Sudan.

—"Iraq Exports WMD Expertise to Arab Allies," *Middle East Newslines*, Vol. 3, No. 84, 28 February 2001.

### **15 February 2001**

The *Herald*, a British newspaper, reports that according to an internal U.N. report, the castor oil production plant near Fallujah has been rebuilt since it was destroyed by U.S. attacks in 1998 and is now potentially capable of manufacturing "a significant amount" of ricin.

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—Ian Bruce, "Revealed: Saddam's Factory of Death; Iraq Uses Castor Oil By-Product to Make Biological Weapons," *The Herald*, 15 February 2001, p. 2.

#### **22 January 2001**

The *New York Times* reports that, according to a new intelligence estimate, "Iraq has rebuilt a series of factories that the United States has long suspected of producing chemical and biological weapons..." The construction of two factories, located in an industrial complex in Fallujah, has resumed, as well as the production of chlorine at a third in the same complex. Government officials say that all three factories were previously involved in producing chemical or biological agents.

—Steven Lee Myers and Eric Schmitt, "Iraq Rebuilt Weapons Factories, Officials Say," *New York Times*, 22 January 2001.

#### **January 2001**

The U.S. Department of Defense, in its report *Proliferation: Threat and Response*, states that "...in the absence of UNSCOM inspections and monitoring during 1999 and 2000, we are concerned that Baghdad again may have produced some biological warfare agents."

—U.S. Department of Defense, Office of the Secretary of Defense, *Proliferation: Threat and Response*, January 2001, p. 40.

#### **19 November 2000**

The *Sunday Telegraph* reports that, according to Western intelligence reports, Iraq has been stockpiling an arsenal of chemical and biological weapons in schools and hospitals. The items listed include large quantities of growth media used to produce biological weapons.

—Christina Lamb, "Saddam Stockpiling Deadly Chemical Weapons," *Sunday Telegraph*, 19 November 2000.

#### **24 May 2000**

In an interview with the *Guardian*, Ambassador Richard Butler, the former chairman of UNSCOM, alleges that he has evidence from his time in Baghdad that Saddam Hussayn had kept weapons of mass destruction from the U.N. and that over the past 18 months he has used the absence of the U.N. to build his arsenal of missiles and chemical and biological weapons.

—Ewen MacAskil, "Iraqi Nerve Gas 'Could Paralyse Western Cities'," *The Guardian*, 24 May 2000.

#### **17 May 2000**

The head of U.K. Defence intelligence says that Iraq "can regenerate [its] biological warfare capability within months."

—"Gulf Weapons Proliferation Unstoppable", *Middle East Economic Digest*, 23 May 2000, p. 4.

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## 1999-1990

### 17 December 1999

The U.N. Security Council adopts Resolution 1284, which replaces UNSCOM with the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC).

### 4 April 1999

The South African paper *Sunday Independent* reports that, according to an unconfirmed report by *Jane's Foreign Report*, a secret Iraqi plan to buy equipment from South Africa for its biological weapons program was foiled. The equipment included stainless steel that could be used to make fermenters, cartridge air filters and mechanical seals.

—Jonathan Rosenthal, "Iraqi Attempt to Buy RSA Equipment Reportedly Foiled," *The Sunday Independent*, 4 April 1999; in FBIS Document FTS19990404000630, 4 April 1999.

### 10 January 1999

Ahmed Murtada Ahmed Khalil, Iraq's Transport and Communications Minister, visits Moscow with representatives of Iraq. During his visit, he signs a number of arms contracts. Murtada is the former director (1987-1990) of the Technical Research Center at al-Salman Pak, which was a part of Iraq's biological weapons program.

—Con Coughlin, "Revealed: Russia's Secret Deal to Re-arm Saddam," *Sunday Telegraph*, 14 February 1999, p. 1; Con Coughlin, "Focus the Re-arming of Saddam: Russia and Iraq - The Deadly Friends," *Sunday Telegraph*, 14 February 1999, p. 22; Con Coughlin, "International: Russian Weapons Experts Confirm Baghdad Connection," *Sunday Telegraph*, 21 February 1999, p. 30.

### 16 December 1998

Saddam Hussayn cuts off all cooperation with U.N. inspectors. U.N. inspectors withdraw from Iraq.

### December 1998

The last inspection by UNSCOM takes place. In total, 74 BW (6 combined CBW) inspections occurred.

### November 1998

Iraq agrees to allow inspectors to return after the U.S. threatens to use military action against it.

### 5 August 1998

Iraq officially suspends all inspections by UNSCOM.

### 14 July 1998

At Iraq's request, UNSCOM holds a third international expert meeting in Baghdad to examine Iraq's biological weapons FFCD of September 1997. The team concludes that "Iraq's full, final and complete disclosure, in its totality, could not be verified."

—United Nations, UNSCOM report to the Security Council, S/1998/920 (1998), 6 October 1998, [www.un.org](http://www.un.org); For more conclusions see: Al J. Venter, "Missing in Iraq: The UN Charts Saddam's Lethal Inventory," *Jane's International*

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*Defense Review*, May 1999, p. 39; United Nations, UNSCOM report to the Security Council, S/1998/920 (1998), 6 October 1998, [www.un.org](http://www.un.org).

### **June 1998**

UNSCOM officials meet with Iraq's Deputy Prime Minister where they determine a schedule of work for the next two months. Included in the schedule is Iraq's request for the team of international experts to reconvene and discuss, along with Iraqi experts, the overall problems with the biological section of the FFCD. [Note: see July 1998 entry for results].

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### **3-4 June 1998**

UNSCOM provides a technical briefing to the U.N. Security Council outlining the material balance and major outstanding disarmament issues in each category. The briefing in the biological area emphasizes the lack of verifiable details on nearly the entire program. The Commission also seeks to create a program to resolve the outstanding issues. For the biological program the priority concerns include: the production of materials and equipment, agents, munitions, and their possible destruction.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### **June 1998**

A new book by Seymour Hersh, *Against All Enemies: Gulf War Syndrome: The War Between America's Ailing Veterans and Their Government*, reveals that just before the Gulf War, the American military discovered that Iraqi soldiers had been inoculated against anthrax. This increased fears in the U.S. that Iraq was preparing to wage biological warfare.

—William J. Broad, "Iraqi's Immunity to Anthrax Raised U.S. Fears, Book Says," *New York Times*, 7 June 1998.

### **April 1998**

*Jane's* reports that an Iraqi opposition group has stated that Iraq is hiding chemical and biological weapons in farms located 30km outside of Baghdad. Reportedly, the weapons had been hidden underground in order to escape satellites.

—"Opposition Groups Claim Iraq Hiding Weapons in Farms," *Pointer*, Vol. 5, No. 4, April 1998, p. 7.

### **8 April 1998**

The report of the biological weapons TEM is submitted to the U.N. Security Council. The experts concluded that Iraq's full, final and complete disclosure is "incomplete and inadequate." The report says that it "contains major mistakes, inconsistencies and gaps in information." Regarding Iraqi claims that missile warheads containing biological weapons had been destroyed, the report says that the Iraqi account "cannot be reconciled with physical evidence."

—UNSCOM: Chronology of Main Events, December 1999, [www.un.org](http://www.un.org); Barbara Crossette, "Experts Deny Iraq Has Ended Its Germ Warfare Program," *New York Times*, 10 April 1998; Barbara Crossette, "Experts Dispute Iraq's Claim It Ended Germ War Effort," *New York Times*, 10 April 1998; John M. Goshko, "Iraq Continued to Hide Arms Data, Experts Say," *Washington Post*, 10 April 1998, p. A20; Judy Aita, "Expert Panel Says Iraqi Data on Biological

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Weapons Is 'Inadequate'," *USIA*, 4 April 1998; "UN Report: Iraq Continues to Hide Scope of Biological Weapons," *CNN*, 10 April 1998.

### **20-27 March 1998**

At Iraq's request, a Technical Evaluation Meeting (TEM) between Iraq and a panel of international experts assembled by UNSCOM is convened in Vienna to allow Iraq to present its case regarding its September 1997 FFCD. —UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **18 March 1998**

A British intelligence report reveals an Iraqi plot to smuggle large quantities of *B. anthracis* into "hostile countries." The intelligence warning leads to tightened security in all British ports and airports. On 24 March the Iraqi government denies the claim that Baghdad had planned to smuggle *B. anthracis* into Britain as "silly and baseless." —Bill Gertz, "Officials Discount Threat of Iraq Smuggling Anthrax to U.S.," *Washington Times*, 25 March 1998, p. A3; "Baghdad Denies British Reports That Iraq Plotted to Smuggle Anthrax," *Chicago Tribune*, 25 March 1998; Richard Norton-Taylor and Ian Black, "Ministers Sound Retreat on Anthrax Warning," *The Guardian*, 25 March 1998, p. 4.

### **March 1998**

The Iraqi government announces that Nassir al-Hindawi, the former director of Iraq's biological weapons program, was arrested trying to fly out of Baghdad with sensitive documents of the Iraqi program. White House aides reportedly suspect that the arrest was staged in order to persuade the U.N. that Iraq is serious about dismantling its weapons of mass destruction. The documents, which were handed over to UNSCOM, included many that UNSCOM had previously known.

—Douglas Waller, "Iraq: Chemical Bothers," *Time Daily*, 30 March 1998; "Weapons Inspectors Get Iraqi Documents," *Washington Times*, 25 March 1998, p. A13; R. Jeffrey Smith, "Iraq Jails Germ Warfare Scientists It Says Wanted to Leave With Documents," *Washington Post*, 25 March 1998, p. A27; Judith Miller, "Iraq Arrests Scientist Viewed as Father of Its Germ War Effort," *New York Times*, 24 March 1998, p. 1.

### **February 1998**

Equipment which could be used to produce *B. anthracis* was exported from Britain to Iraq as recently as 1994. —"Report: Germans Sold Weapons to Iraq," *United Press International*, 17 February 1998.

### **January 1998**

The London *Times* and the *Guardian* quote Western intelligence sources as saying that Libya is receiving "extensive help" from Iraqi scientists in a covert program, believed to be code-named Ibn Hayan, to develop biological weapons. According to the reports, up to a dozen Iraqi scientists who had been involved in Iraq's biological weapons program have transferred to Libya under a special arrangement between Iraq and Libya about 7 months prior. The scientists joined other Iraqi researchers who have been in Libya since 1991. Intelligence sources believe that the Iraqi scientists have been employed to assist Libya in developing "an extensive complex called General Health Laboratories," located near Tripoli. Iraq and Libya deny the reports, saying they are a part of a hostile

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American campaign.

—Michael Evans, "Iraqi Scientists 'Helping Libyan Germ Warfare'," *Times*, 6 January 1998; Michael Georgy, "Iraq, Libya Deny Collaborating on Bacterial Weapons," *Washington Times*, 11 January 1998, p. 10.

### January 1998

Saddam Hussayn calls for a freeze on all weapons inspections, including at sensitive "presidential sites," until weapons experts evaluate Iraq's disarmament efforts in a series of planned "technical evaluation meetings" next month.

—Barbara Crossette, "Iraq Orders Freeze on Arms Inspections," *New York Times*, 22 January 1998; Dominic Evans, "Arms Inspector Rejects Call by Iraq for Freeze on Probe," *Washington Times*, 22 January 1998, p. A11.

### 1998

Iraq is further developing its aerial delivery platforms to include remotely piloted vehicles, modified L29 trainers, and Polish M-18 Dromader agricultural crop-sprayers. It is asserted that Hussayn's eldest son Uday has developed a front "cloud seeding" program (cloud seeding is the method of dispersing silver iodide particles into clouds from aircraft, which stimulates rain.)

—Alan George, "New Iraqi Covert Weapons Projects Discovered," *The Middle East*, January 1999, p. 11; Damian Kemp, "Iraq's UAVs Will Advance 'Anthrax Air Force,'" *Jane's Defense Weekly*, 6 January 1999, p. 3.

### November 1997

The Emergency Session of UNSC concludes that the biological weapons file was the most serious area in which Iraq had disregarded its obligations under Security Council Resolution 687. The Commission members defend this point of view by citing that FFCD of September 1997 was not different than previous unacceptable versions and that it remains unsupported by documentation and evidence.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### 13 November 1997

Iraqi President Saddam Hussayn gives orders to expel the Americans inspectors. The next day Richard Butler pulls out all other inspectors.

—Barbara Crossette, "U.N. Council Gets Evidence of Iraqi Illicit Arms Buildup," *New York Times*, 20 November 1997.

### November 1997

The *Sunday Times* reports that, according to Iraqi and Western intelligence sources, Iraqi scientists had adopted Polish M-18 crop duster aircrafts to conduct biological warfare by remote control. The modified aircrafts could carry up to a ton of *B. anthracis*. The British paper also reports that up to 16 al-Hussayn long-range missiles also have been adapted to carry *B. anthracis* with the help of privately hired Russian scientists.

—"Could Iraq Spread Death Via Remote Crop Dusters?" *Deseret News*, 9 November 1997, <http://deseretnews.com>; "Anthrax: Iraq's Doomsday Option?" *Washington Times*, 9 November 1997.

### November 1997

The German Federal Intelligence Service (BND) has information that Iraq is developing an "economic biological

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weapons," said to be a fungus that affects cereals and could be used to destroy crops.

—Michael J. Inacker, "Bacteria-Saddam Is Building Missiles That Go As Far As Europe," *Welt am Sonntag*, 30 November 1997; in FBIS Document FBIS-TAC-97-335, 1 December 1997.

#### **October 1997**

In his first report to the U.N. Security Council since taking over leadership of UNSCOM from Rolf Ekeus, Richard Butler concludes that Iraq is continuing to hide information on biological arms and says that "there has been no progress" in dismantling Iraq's biological weapons.

—Barbara Crossette, "New U.N. Monitor Says Iraq Is Still Hiding Data on Weapons," *Christian Science Monitor*, 8 October 1997; "UN: Iraq Did Not Destroy Its Biological Weapons," *Globes*, 8 October 1997, [www.globes.co.il](http://www.globes.co.il).

#### **September 1997**

The Iraqi government submits to the U.N. its fifth FFCD, a 639-page document, which contains no new significant information from the previous one. A panel of international experts reviews the FFCD and concludes that it is deficient in all areas.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org); "Iraq Gives Biological Weapons Statement to U.N.," *CNN*, 11 September 1997; "Iraq Gives U.N. Statement on Biological Weapons," *Reuters*, 11 September 1997; Jeffrey Smith, "Iraq's Drive for a Biological Arsenal," *Washington Post*, 21 November 1997.

#### **12 June 1997**

U.N. officials attempt a surprise inspection of the headquarters for the 2nd Battalion of Iraq's Special Republican Guard. The inspectors expect to find records of a transfer of biological agents in refrigerated coolers from a military training center and al-Bakr University. When they arrive, the inspectors are not allowed to enter. According to one inspector, the team witnessed a series of "items being passed over a wall" from the guard headquarters into the presidential villa nearby.

—"Chasing Iraq's Deadly Arsenal U.N. Is Seeking 25 Warheads With Some of the World's Most Virulent Germs, Outgrowth of Toxin Sent from U.S.," *Pittsburgh Post-Gazette*, 25 November 1997.

#### **May 1997**

UNSCOM offers Iraq the opportunity to clarify the deficiencies in the biological FFCD. It is expected that the concerns raised by the Commission will be addressed in detail in the next FFCD.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

#### **18 April 1997**

Rolf Ekeus presents to the U.N. Security Council on the progress of inspections and states that Iraq is still not cooperating fully with the U.N. to dismantle its programs to produce biological, chemical, and nuclear weapons.

—Edith M. Lederer, "Biological Weapons," *The Associated Press*, 24 April 1997.

#### **April 1997**

U.N. inspectors decide to interview Shakir-Akidi, a biology professor at Baghdad University who had been linked to work on toxins. As they arrive at the site, an unidentified man, who later turned to be Shakir, was rushing out of

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the building with a stack of papers under his arm, which he claims were owned by his wife. The papers included evidence that the government had harvested castor beans round-the-clock in late 1990, from which ricin is isolated.

—"Chasing Iraq's Deadly Arsenal U.N. Is Seeking 25 Warheads With Some of the World's Most Virulent Germs, Outgrowth of Toxin Sent from U.S.," *Pittsburgh Post-Gazette*, 25 November 1997.

#### **March 1997**

A biological Technical Evaluation Meeting (TEM) between UNSCOM international experts and Iraq is convened in Vienna to discuss Iraq's FFCD. The TEM concludes that the FFCD has substantial deficiencies.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

#### **14-15 February 1997**

UNSCOM 173 supervises excavations of the pits at al-Aziziyah, where Iraq declared it destroyed the R-400A bombs.

—U.S. Intelligence Community, *Intelligence Related to Possible Sources of Biological Agent Exposure During the Persian Gulf War*, August 2000, [www.gulflink.osd.mil](http://www.gulflink.osd.mil).

#### **Early 1997**

UNSCOM discovers documents that show Iraq had produced ricin.

—*Iraq's Weapons of Mass Destruction Programs*, U.S. Government White Paper, 13 February 1998.

#### **1 November 1996**

The *Washington Times*, quoting U.S. intelligence documents that were placed on the Internet, reports that before and during the Gulf War Iraq hid chemical and biological weapons in Iran, using camouflaged trucks. Once in Iranian territory the trucks were turned over to the Iranian Revolutionary Guards Corps (IRGC).

—"Iraq Hid Bio Agents in Iran," *Washington Times*, 1 November 1996.

#### **22 June 1996**

Iraq submits its forth "Full, Final and Complete Disclosure" (FFCD) of its biological weapons program. After intensive efforts to verify its accuracy, the Commission rejects it for reasons of a lack of accuracy and credibility.

—William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

#### **May-June 1996**

The Iraqis, under UNSCOM's supervision, destroy the extensive buildings, equipment and materials at the facilities al-Hakam and Daura and al-Manal.

—William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998; Tim McCarthy, *Iraq's Biological Weapon Sites and Facilities*, Center for Nonproliferation Studies, Monterey Institute of International Studies, July 1999, p. 8.

#### **20 March 1996**

In a testimony before a Senate sub-committee, Rolf Ekeus says that Iraq may have up to 16 missiles armed with

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biological warheads hidden on trucks that could be moved quickly.

—"Weapons Inspector: Iraq May be Hiding Biological-Warhead Missiles," *Washington Times*, 21 March 1996, p. A15.

#### **Mid-1990s**

U.N. inspectors find a freeze drier labeled "smallpox vaccine" at the maintenance shop of the State Establishment for Medical Appliances Marketing, an arm of the Ministry of Health, which was involved in biological warfare. Freeze driers are dual use equipment that could be used to prepare germs for dissemination. The freeze driers that were found by UNSCOM were supplied to Iraq by the WHO and were very old machines.

—William J. Broad and Judith Miller, "Government Report Says 3 Nations Hide Stocks of Smallpox," *New York Times*, 13 June 1999, p. 1.

#### **October 1995**

Tariq Aziz, Iraq's deputy foreign minister, announces that during the Gulf War, military strategy had been such that as long as Coalition forces utilized conventional weapons Iraq would do the same. If nuclear weapons were used, then Iraq's military was to respond with all weapons available to them, including biological and chemical weapons.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

#### **August 1995**

Tariq Aziz tells UNSCOM Director Rolf Ekeus that Iraqi officials believed during the Gulf War that the United States would retaliate with nuclear weapons against any chemical or biological weapon attack made by Iraq.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

#### **Late 1995**

Iraq acknowledges weapons testing with ricin but does not provide details on the amount produced.

—*Iraq's Weapons of Mass Destruction Programs*, U.S. Government White Paper, 13 February 1998.

#### **October 1995**

Iraqi Oil Minister Amir Rashid says that "Iraq had no intention of using biological weapons unless the allies or Israel attacked Baghdad with nuclear weapons."

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal" Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James J. Wirtz (Ed.), *Planning the Unthinkable: How New Powers Will Use Nuclear, Biological and Chemical Weapons*, (Ithaca and London: Cornell University Press, 2000), p. 69.

#### **October 1995**

Saddam Hussayn's son-in-law Hussayn Kamil identifies a U.N. envoy's interpreter as an Iraqi spy.

—"Hussein Kamil Identifies 'Spy' at UN," *Der Spiegel*, 23 October 1995; in FBIS Document FBIS-NES-95-205, 23 October 1995.

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### **September 1995**

Tariq Aziz says that if Iraq had come under nuclear attack in the Gulf War, it would have retaliated with biological weapons.

—"U.N. Reports Iraq Getting Rid of Its Chemical Weapons," *Nando Times*, 9 September 1997.

### **June - August 1995**

UNSCOM contends that during this time a number of political prisoners had been transferred from the Abu Gharib Prison to a secret site in western Iraq, where they were tested with chemical and biological agents under the supervision of a special unit from the Military Industrial Commission. According to a weapons inspector, there is "credible evidence" that prisoners were taken from the Abu Gharib to al-Salman.

—Betsy Pisik, "Chemical Arms Tests on Inmates Suspected," *Washington Times*, 15 January 1998, p. 1; Scott Ritter, Saddam's Trap," *New Republic*, 21 December 1998, p. 18; "U.N. Looks Into Reports That Iraq Used Humans in Weapons Tests," *MSNBC*, date is not identified.

### **20 August 1995**

Following the defection of Kamil, Iraq presents UNSCOM with new information on its past BW program, including details concerning weaponization, key personnel, types of agents and munitions, and sites. The information is presented in 150 boxes of documents at a chicken farm.

—U.S. Arms Control and Disarmament Agency, *Adherence To and Compliance With Arms Control Agreement*, 1997 Annual Report, <http://dosfan.lib.uic.edu>; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org); William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998.

### **8 August 1995**

Lt. General Hussayn Kamil Hassan, Sadam Hussayn's son-in-law and Iraq's WMD czar, defects to Jordan and provides information on the scope of the Iraqi BW program.

—William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998; UNSCOM: Chronology of Main Events, December 1999, [www.un.org](http://www.un.org).

### **4 August 1995**

Iraq submits its third "Full, Final and Complete Disclosure" (FFCD) of its biological weapons program, which was later declared null and void by Iraq itself.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **1 July 1995**

Iraq admits for the first time that it had an offensive biological weapons program, and that it secretly manufactured botulinum toxin and *B. anthracis* before the Gulf War. Iraq denies agent weaponization and contends that it did not have the way to deliver biological weapons. The Iraqis also acknowledge that the factory at al-Hakam had produced thousands of gallons of *B. anthracis* and botulinum toxin.

—Edith M. Lederer, "Biological Weapons," *The Associated Press*, 24 April 1997; Christian Seelos, "Lessons from Iraq

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on Bioweapons," *Nature*, Vol. 398, 18 March 1999, p. 187; R. Jeffrey Smith, "Iraq Had Program for Germ Warfare," *Washington Post*, 6 July 1995, p. A1; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org); William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

#### **June 1995**

A meeting is held between Iraqi biologists from the Chemical Engineering Design Center (CEDC) and Russian government officials in Moscow. The purpose of the meeting is to gather information regarding assistance with production and research in biotechnology, as well as the possibility of Russia supplying Iraq with a complete factory for the production of single-cell protein, ostensibly for use in an animal feed factory. This includes a 5,000L fermentation vessel. Four of the Iraqis were senior officials at al-Hakam and worked with Dr. Taha. In July, Iraq accepts the Russian offer to supply the plant, which according to Ken Alibek was specially configured for BW applications.

—Scott Ritter, *Endgame: Solving the Iraq Problem - Once and for All*, (New York: Simon & Schuster, 1999), p. 220.

#### **10 April 1995**

In its report to the Security Council, UNSCOM reveals for the first time that Iraq had an undeclared biological weapons program.

—Laurie Mylroie, "The Method to Saddam's Madness," *Washington Times*, 13 January 1999, p. 17; Laurie Mylroie, "Iraq's Weapons of Mass Destruction and the 1997 Gulf Crisis," *MERIA Journal*, Vol. 4, December 1997.

#### **March 1995**

Iraq submits its second FFCD of its biological weapons program. It contains no new significant information from the previous one.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

#### **January 1995**

Two European companies acknowledge selling Iraq 39 tons of growth media. No more detail is given.

—John Barry, "Unearthing the Truth," *Newsweek*, 2 March 1998.

#### **1995**

An agreement between the Russian government and Iraq on the sale of sophisticated fermentation equipment that could be used to develop biological weapons is reached. The 5,000L fermentation vessel would ostensibly be used to make single-cell protein for animal feed. As of February 1998, the inspectors were not certain if Iraq received the equipment.

—R. Jeffrey Smith, "Did Russia Sell Iraq Germ Warfare Equipment? Document Seized by U.N. Inspectors Indicates Illicit Deal," *Washington Post*, 12 February 1998, p. A1; Mort Rosenblum, "'Poor Man's Bomb' Is a Biological Nightmare In Waiting," *San Diego Union-Tribune*, 26 December 1998.

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### 1995

General Wafiq al-Sammara'i, former head of Iraqi Military Intelligence, defects and reveals that Hussayn is concealing more chemical and biological weapons than was released to U.N. inspectors. This includes a possible "'255 containers' of biological materials - 230 with powder and 25 with liquid."

—Sean Boyne, "Iraq 'Unlikely' to Give Up Nuclear Option," *Jane's Intelligence Review & Jane's Sentinel Pointer*, September 1996, p. 6.

### 1994-1995

In February 2001 Professor Hussayn al-Shahrestani, an Iraqi nuclear scientist, has revealed that between 1994 and 1995 Iraq dumped barrels containing biological weapons and banned chemicals in the Euphrates and Tigris Rivers and exploded chemical weapons in isolated wastelands. The purpose of this action was to prevent the U.N. inspectors from discovering them.

—Mu'idd Fayyad, "Iraqi Nuclear Scientist Hussein al-Shahrestani: Baghdad Dumped Barrels of 'Chemical' Weapons in the Tigris and Euphrates," *Al-Sharq al-Awsat*, 26 February 2001, p. 5; in "Scientist Claims Iraq Dumped Chemical, Biological Weapons in Rivers," FBIS Document GMP20010227000063, 26 February 2001.

### December 1994

UNSCOM discovers that the Technical and Scientific Materials Import Division (TSMID) has imported quantities of culture media, used to grow microorganisms, on behalf of the Ministry of Health. The shipment totaled 39 tons packed in 25-100 kg drums, which created suspicion (usually it is supplied in packages weighing 100-500 grams). By 1997, only 22 of the 39 tons of biological growth media have been accounted.

[Note: By 1997, the growth media would be spoiled.]

—Al J. Venter, "New-Era Threat: Iraq's Biological Weapons," *Middle East Policy*, Vol. 6, No. 4, 4 June 1999, p. 107; James Hackett, "Saddam and the Risk of Germ Warfare," *Washington Times*, 27 May 1997, p. A17.

### June 1994

U.N. inspectors find a mass grave near al-Salman Pak biological weapons center. Iraqi officials deny that the dead were human test subjects exposed to biological agents. An Iraqi representative tells the U.N. that the dead were "political agents" who had been executed.

—Bruce Auster, "In Iraq, Hints of Biological Atrocities," *U.S. News & World Report*, 26 January 1998, p. 46; Al J. Venter, "Biological Warfare Atrocities Revealed," *Pointer*, March 1998, p. 1.

### 1994

U.N. inspectors install remote cameras at Al-Hakam.

### November 1993

UNSCOM says in a report to the U.N. Security Council that Iraq had satisfied all its obligations in the biological sphere, and it was regarded closed. Later, under pressures, UNSCOM reopened the biological dossier.

—"INA Reviews Government Cooperation with UN," *INA DATE*; in FBIS Document NO, 18 June 1995.

### May 1993

In March 2001 it was reported that Muhammad Ibrahim al-A'zami, a former Iraqi police officer who fled to

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Germany recently, has revealed that in May, 1993, Iraq buried banned chemicals and biological material in al-Karkh Cemetery, 25 km from Baghdad. He said that the materials were placed inside nine "well-built and tightly sealed coffins" and placed under guard. In February 2001, al-A'zami visited the cemetery and discovered that the nine graves had been leveled and the guards disappeared.

—Mu'idd Fayyad, "Escapee Iraqi Police Officer Reveals Secret of Bogus Funerals. Baghdad's Authorities Buried Chemical and Biological Material," *Al-Sharq al-Awsat*, 12 March 2001, p. 3; in "Iraqi Escapee Cited on Regime's Concealment of 'Chemical, Biological' Material," FBIS Document GMP20010312000143, 12 March 2001.

#### **11-18 March 1993**

A dedicated biological weapons inspection takes place in Iraq. The inspection fails to turn up any conclusive evidence.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 278.

#### **24 February 1993**

CIA Director James Woolsey, in his testimony before the Senate Government Affairs Committee, states that Iraq still possesses an "advanced" biological weapons program, despite the Gulf War bombings and the inspections.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 259.

#### **30 December 1992**

The *New York Times* reports that a document, which has been circulated by a Kurdish group, "contains the first written indication that Baghdad has possessed biological weapons since 1986."

—"Document Says Iraq Has Biological Weapons," *New York Times*, 30 December 1992, p. A9.

#### **6-14 December 1992**

A joint U.N. chemical/biological weapons inspection takes place in Iraq. The inspection fails to find any conclusive evidence.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 278.

#### **26 June - 10 July 1992**

A joint U.N. chemical/biological weapons inspection takes place in Iraq. The inspection fails to turn up any conclusive evidence.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 278.

#### **May 1992**

Iraq gives the U.N. its first "Full, Final and Complete Disclosure" (FFCD) for its biological program. Baghdad denies having ever experimented in any kind of biological arms, and states that al-Hakam, the FMD plant and VRL were not related to BW activities. Iraq admits to having only a "defensive" biological weapons program.

—William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26

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February 1998; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org); UNSCOM: Chronology of Main Events, December 1999, [www.un.org](http://www.un.org).

## **1992**

Research and development is thought of to have ended on a "lethal virus (NFI)" at the al-Mana AI facility. Research includes work on small scale biological weapon dissemination including explosives and/or aerosols. The facility had been operational throughout the first Gulf War.

—"Al-Mana AI Biological Weapons Project". CIA 325352. October, 1993, [www.fas.org](http://www.fas.org).

## **1992**

According to Iraq, it installs a spray dryer, purchased from Denmark, at al-Hakam, for what it claims is benign use.

—Jeffrey Smith, "Iraq's Drive for a Biological Arsenal," *Washington Post*, 21 November 1997.

## **18 November - 1 December 1991**

The U.N. conducts its third biological inspection. The inspections are carried out by surprise. No evidence is found that the facilities were used for biological weapons purposes.

—*Appendix V: U.N. Inspections in Iraq Suspected Biological Weapons Facilities*, GAO/NSIAD-93-113 Arms Control, p. 56.

## **25 October 1991**

UNSCOM submits a report to the U.N. Security Council describing the findings from inspections thus far. The reports states, "conclusive evidence that Iraq was engaged in an advanced military biological research program has been collected. No evidence of actual weaponization has been found, but the inspections have provided a sound data base for future monitoring of biological capabilities in Iraq."

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 257.

## **20 September - 3 October 1991**

The second team of U.N. biological experts does not find any biological weapons or facilities for filling weapons. The inspectors identify several sites for which they recommend future monitoring. The al-Hakam facility is inspected for the first time. U.N. inspectors accept Iraqi claim that its function is benign.

—"Several Iraqi Sites Recommended for Future Monitoring by Second U.N. Biological Weapons Inspections Team," Press Statement issued by the Special Commission, 31 October 1991; Christian Seelos, "Lessons from Iraq on Bioweapons," *Nature*, Vol. 398, 18 March 1999, p. 187.

## **September 1991**

The first inspection at al-Hakam takes place.

—Christian Seelos, "Lessons from Iraq on Bioweapons," *Nature*, Vol. 398, 18 March 1999, p. 187.

## **2 August 1991**

UNSCOM inspectors arrive at al-Salman Pak to discover that a few days before, part of the facility had been blown up and covered with dirt.

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[Note: According to UNSCR 687, facilities and equipment used in support of any WMD program has to be destroyed by UNSCOM or IAEA officials].

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, 6 August 1997, pp. 418-424.

### **2 August 1991**

Iraq declares to the inspection team that it had conducted "biological research activities for defensive military purposes."

—UNSCOM: Chronology of Main Events, December 1999, [www.un.org](http://www.un.org).

### **2-7 August 1991**

The first UNSCOM biological inspection team arrives at al-Salman Pak. U.N. inspectors say they had found "a capability to research, produce, test and store biological warfare agents" at al-Salman Pak but found "no evidence of biological weapons per se" and "no facility for filling weapons."

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past As Future?" *Journal of the American Medical Association*, Vol. 278, No. 5, 6 August 1997, p. 420; Paul Lewis, "UN Weapons Inspectors Renew Hunt in Iraq," *New York Times*, 17 November 1991, p. 12; "UN Inspection Team Reports on Iraq's Biological Weapons Capacity, Finds No Evidence of Current Stocks," Press Statement issued by the Special Commission, 14 August 1991.

### **July 1991**

According to Iraq's declaration, it unilaterally destroys 25 BW warheads at specific locations at al-Nibai desert.

### **July 1991**

Weapons carrying biological warfare agents are destroyed.

[Note: UNSCOM was able to confirm the destruction of some R-400 and missile warheads but the totality cannot be verified].

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### **June 1991**

According to Iraq, before the arrival of the first UNSCOM BW team, it transfers the growth media that remained at al-Hakam to the State Company for Drugs and Medical Appliances Marketing (known as Kimadia) within the Ministry of Health. The role of Kimadia was to provide a cover story for media that had been consumed in the weapons program.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **June 1991**

Bulk biological agent is destroyed.

[Note: although UNSCOM officials were able to hear interview testimony that bulk agent was destroyed there are inconsistencies in the account, and there is no physical or documentary evidence].

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

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**May 1991**

According to Iraq, the al-Asmaa School is broken into and some growth media is stolen.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

**May or June 1991**

According to Iraq, it secretly destroys all its biological agents and weapons and documents. It provides no credible evidence to support these claims.

—William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998; Christian Seelos, "Lessons from Iraq on Bioweapons," *Nature*, Vol. 398, 18 March 1999, p. 188.

**18 April 1991**

Iraq provides its initial declaration under resolution 687. It declares it has no biological weapons program.

—UNSCOM: Chronology of Main Events, December 1999, [www.un.org](http://www.un.org).

**18 April 1991**

Iraq ratifies the Biological Weapons Convention.

**1991**

BW munitions are reportedly destroyed per the ceasefire agreements. Warheads are opened and formaldehyde and potassium permanganate are added to the solution. The munitions are then bulldozed, burned and concealed by detonating conventional bombs among the remains. Some test munitions are reportedly thrown in the Tigris without being destroyed.

[Note: UNSCOM has not been able to recover all of the R400s and therefore cannot verify that all of the biological bombs were destroyed].

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, Vol. 278, No. 5, 6 August 1997, pp. 418-424.

**April 1991**

After the ceasefire agreements are reached, 11 biological warfare program personnel are reportedly ordered to destroy the biological agents.

[Note: the 2-step process should have produced a residuum that was said to be poured on the bare ground near al-Hakam. In 1996 UNSCOM inspectors were unable to recover any residuum or its breakdown products. The destruction of the agents is therefore unverified].

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, Vol. 278, No. 5, 6 August 1997, pp. 418-424.

**6 April 1991**

Iraq accepts resolution 687.

—UNSCOM: Chronology of Main Events, December 1999, [www.un.org](http://www.un.org).

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### **3 April 1991**

The U.N. Security Council adopts Resolution 687 which requires that Iraq unconditionally destroy all non-conventional weapons as well as 'undertake not to use, develop, construct or acquire' such weapons. A special commission, UNSCOM, is created to dismantle Iraq's weapons of mass destruction.

—U.N. Resolution 687.

### **April 1991**

Operation Desert Storm ends with a cease-fire and UNSCR 687.

### **March 1991**

According to Professor Hussayn al-Shahristani, an Iraqi nuclear scientist, Iraq uses aflatoxin to suppress the uprising in Karbala.

—An interview with Iraqi nuclear scientist Professor Hussayn al-Shahristani by Mu'idd Fayyad in London, *Al-Sharq al-Awsat*, 19 March 2001, p.3; in "Iraqi Scientist on Iraq's Use of Poison Gases, Chemical Weapons," FBIS Document GMP20010319000087, 19 March 2001.

### **22-23 January 1991**

Iraq is relocating equipment from al-Hakam to the al-Asmaa School. Iraq declared that some growth media was lost during the relocation.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **18 January 1991**

Iraq strikes at Israel with conventionally armed ballistic missiles.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

### **13 January 1991**

Trials of Iraqi Mirage spray tanks to disperse biological agents were held as late as this date.

—"Anthony Cordesman, "Iraq's Search for Weapons of Mass Destruction", *The Military Balance in the Middle East*, Part XIV, Center for Strategic and International Studies, 6 September, 1999, pp. 50-60.

### **10 January 1991**

Iraq carries out a field test at the Air Force al-Rashid Airbase, in which a remotely piloted vehicle (a modified MIG-21 fighter plane) sprays a solution laden with a biological stimulant over a practice target range at the Air Force al-Rashid Airbase. The results of this test remain unknown.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past As Future?" *Journal of the American Medical Association (JAMA)* Vol. 278, No. 5, 6 August 1997, p. 420.

### **9 January 1991**

U.S. Secretary of State James Baker tells Iraq's deputy foreign minister Tariq Aziz, "if there is any use of [chemical

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and biological weapons], our objectives won't just be the liberation of Kuwait, *but the elimination of the current Iraqi regime*, and anyone responsible for using those weapons would be held accountable" (emphasis added). [Note: According to McCarthy, this threat was meant to hit Hussayn where it mattered most - his regime and his hold on power. It would appear that Iraq was deterred from using unconventional weapons by the knowledge that Coalition forces may respond with nuclear weapons. - see *August and October 1995 entries for further details.*] —Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

#### **January 1991**

Iraqi military command threatens to use a "secret weapon."

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

#### **January 1991**

Iraq deploys R-400 bombs and al-Hussayn warheads filled with biological warfare agents at four locations. 200 aerial bombs and about 80 missile warheads filled with *B. anthracis* are hidden near Tikrit.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>; Dany Shoham, "Iraq's Biological Warfare Agents: A Comprehensive Analysis," *Critical Review in Microbiology*, Vol. 26, No. 3, 2000, p. 182.

#### **1991**

According to Iraqi claims, Iraq destroys all its weapons, agents and documents, but it provides no credible evidence.

—Christian Seelos, "Lessons from Iraq on Bioweapons," *Nature*, Issue 398, 18 March 1999, p. 188.

#### **1991**

According to U.N. inspectors, the so-called Special High Committee, chaired by Deputy Prime Minister Tariq Aziz, meets to plan a massive concealment of Iraq's nuclear, biological, chemical and missile programs.

—"The Inspector's Story," *CNN/Time Impact*, 1 March 1998.

#### **1991-1995**

Iraq categorically denies having a biological weapons program.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

#### **January 1991**

Hussayn gives orders to his commanders to launch chemical and biological weapons against enemy capitals and troops if Iraq is attacked by nuclear weapons. The decision is made to not use chemical or biological weapons against coalition troops and civilian populations due to the U.S. threat that, "any use of unconventional arms would provoke a devastating response," which was taken to mean nuclear retaliation.

—Anthony Goodman, "Iraq Targeted "Enemy Capitals" if Baghdad is Nuked," *Reuters*, 21 September 1995.

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### **1990-1991**

12-Frame bunkers are found located in the al-Salman Pak facility and containing lighting arrestors and possible airlocks. These bunkers were also environmentally controlled and several with refrigeration units. Bunkers of similar disposition are found in other areas of Iraq and deemed possible BW-agent or CW storage bunkers. Many bunkers were located in ammunition storage depots throughout Baghdad.

[Note: these storage facilities probably did not contain BW or CW agents or munitions when they were bombed, but their construction would have been suitable for CBW storage and possibly designed for just this purpose.]

—"Intelligence Related to the Possible Sources of Biological Agent Exposure During the Persian Gulf War", August 2000, [www.gulflink.osd.mil](http://www.gulflink.osd.mil).

### **December 1990-January 1991**

Iraq weaponizes biological warfare agents on a large scale at al-Muthanna.

[Note: UNSCOM does not contest the weaponization; many details are left unconfirmed, but there is evidence from R-400 bombs and al-Hussein missiles the BW agents were used with the weapons].

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://www.cns.miis.edu>; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **December 1990**

Iraq develops an additional delivery means, by modifying a Mirage F-1 drop tank to create a biological weapons spray tank. The tank could spray up to 2,000L of *B. anthracis*. Two field trials are conducted in December 1990 at the Abu Obiydi Airbase, and an additional one on January 13, 1991. The trials are purportedly a failure.

Nevertheless, three additional drop tanks are modified are stored, ready for use.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://www.cns.miis.edu>; Barbara Starr, "Iraq Reveals a Startling Range of Toxin Agents," *Jane's Defense Weekly*, 11 November 1995; U.S. Intelligence Community, *Intelligence Related to Possible Sources of Biological Agent Exposure During the Persian Gulf War*, August 2000, [www.gulflink.osd.mil](http://www.gulflink.osd.mil).

### **Late 1990**

Iraq starts a crash program to harvest castor beans, from which to extract a large quantity of ricin.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal" Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James J. Wirtz (Ed.), *Planning the Unthinkable: How New Powers Will Use Nuclear, Biological and Chemical Weapons*, (Ithaca and London: Cornell University Press, 2000), p. 54.

### **13 November 1990**

British Prime Minister, Margaret Thatcher, tells the House of Commons, "We believe that [Saddam Hussayn] also has biological weapons at his disposal."

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 242.

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### **November 1990**

Iraq modifies a drop tank to create a prototype of Mirage F-1 drop tank and conducts a series of trials.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **November 1990**

Iraq declares the 10L of ricin it produced were used in a field trial using 155mm artillery shells.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **Fall 1990**

According to an Iraqi defector, Hussayn personally orders "...plans be drawn up for airborne delivery of a biological agent using an SU-22 ground-attack aircraft equipped with an onboard spray tank."

[Note: the source states that aspects of this account are unconfirmed or inconsistent with other information.]

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

### **28 September 1990**

Les Aspin, chairman of the U.S. House Armed Services Committee, tells reporters that the U.S. intelligence community projects that Iraq would be able to produce and stockpile a "military significant number" of biological weapons by early 1991.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 241.

### **Late September - November 1990**

Special warheads designed to deliver chemical and biological payloads are shipped by the director of Project 144 to al-Muthanna State Establishment, Iraq's main chemical weapon production facility. The director believes that all of the special warheads are intended for chemical fill. Due to the terminal velocity of this type of ballistic missile, developing the triggering device to release chemical or biological agents would be very difficult. In an effort to avoid using proximity fusing, Iraq launches a program using parachutes to slow the speed of the warheads in order to better disperse agent payload before impact.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

### **September 1990**

Al-Manal facility is established at Maura in order to produce botulinum toxin for weapons. Additionally, *B. anthracis* spores are produced at al-Manal

[Note: The al-Hakam report confirms that *B. anthracis* was produced at al-Hakam but Iraq denies that al-Manal produced *B. anthracis*, despite spore genes being found on a fermenter and storage vessels. There is documentary

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evidence that 5000L of botulinum toxin were produced at al-Manal].

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

#### **September 1990**

R-400s are tested at al-Muhammadiyah. It is likely that the tests are undertaken with weapons deployed [Note: Iraq included this statement in the first FFCD and later withdrew it. UNSCOM inspectors spoke with weapons staff and are confident the tests took place].

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

#### **September 1990**

Iraq begins production of *B. anthracis* on an industrial scale at al-Hakam.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

#### **August 1990**

According to Iraq's declaration, it conducts a trial to determine the size of the "booster charge" required to disperse agent for R-400 bombs at al-Hakam. Iraq has failed to provide evidence for the trials. Iraq conducts trials of R-400 aerial bombs with *Bacillus subtilis*, to simulate an attack using *B. anthracis* in mid-August. Later in the month Iraq conducts trials of R-400 aerial bombs using *B. subtilis*, botulinum toxin and aflatoxin.

—Tim McCarthy, *Iraq's Biological Weapon Sites and Facilities*, Center for Nonproliferation Studies, Monterey Institute of International Studies, July 1999, p.8. UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **August 1990**

Iraq begins to produce *Clostridium perfringens*, a biological agent that causes gas gangrene, for biological weapons purposes at al-Hakam using the 150-liter fermenter, which has been relocated from al-Salman Pak.

—Barbara Starr, "Iraq Reveals a Startling Range of Toxin Agents," *Jane's Defense Weekly*, 11 November 1995; UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **August 1990**

Following its invasion to Kuwait on 2 August, Iraq launches a crash program to speed biological weapons development. The program includes research into virology and genetic engineering. Iraq shifts its emphasis to production and later to weaponization of biological warfare agents. The Foot and Mouth Disease plant at Daura is converted to biological weapons production.

—William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998; UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715, 1991, S/1995/864, 11 October 1995, <http://cns.miis.edu>; "Does Iraq Have 1,000-Year Weapons?" *MSNBC*, date not identified; UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

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### **August 1990**

Through a unilateral decision by Lt. Gen. Hussayn Kamil Hassan, Iraq decides to produce biological weapons for the Gulf War.

—Iraqi Declarations, September 1997.

### **August-October 1990**

Following Iraq's invasion of Kuwait, a large-scale production and weaponization of BW agents begins. During this time Iraq claims it produced 19,000L of concentrated botulinum toxin, 8,500L of a concentrated (10 10 spores per mL) slurry of anthrax spores, and 2,200L of concentrated aflatoxin. UNSCOM is unable to confirm the claim of aflatoxin production but does find indications that *Clostridium perfringens* bacteria was cultivated on a large scale.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

### **2 August 1990**

Iraq invades Kuwait.

### **July 1990**

Research on viruses for biological weapons purposes starts at al-Salman Pak by Dr. Hazim Ali.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715, 1991, S/1995/864, 11 October 1995, <http://cns.miis.edu>; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **July 1990**

Dr. Hazim Ali, an Iraqi virologist, begins work on virus research for BW purposes.

[Note: UNSCOM finds this information consistent with Dr. Ali's work].

— *Full, Final and Complete Disclosure of Iraq's Past Biological Programme*, September 1997; UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### **May 1990**

Iraq carries out successful live firings of 122mm rockets and aerial bombs filled with BW agents.

—UNSCOM Eighth Report Under Paragraph 8, Security Council Resolution 715, 1991, S/1995/864, 11 October 1995, <http://cns.miis.edu>.

### **18 April 1990**

Hussayn gives a speech to his General Command and the Revolutionary Command Council, where he boasts, "If any party...tries to attack any Arab that accepts out assistance, we will respond to the aggressor to the best of our ability.... If we can strike him with all our missiles, bombs and resources, then we will strike him [with these weapons]."

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

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### **1 April 1990**

Hussayn makes a speech to a delegation of U.S. Senators reiterating that if Israel were to attack Iraq with a nuclear weapon, Iraq will use a binary chemical weapon in response. While this speech does not make direct reference to biological weapons, and in fact, Saddam denies Iraq is pursuing them, he does emphasize Iraq's right to obtain any weapon already in the Israeli arsenal.

[Note: Iraqi "binary" weapons are not equivalent to U.S. binary chemical weapons.]

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

### **March 1990**

Iraq starts genetic engineering program under Dr. Ali Nuria Abdal Hussayn.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **Spring of 1990**

Forty high performance aerosol generators are acquired. These have the capability of disseminating either liquid or dry material at 50 liters per minute.

—"Iraqi Biological Warfare Developments", October 1990, [www.gulflink.osd.mil](http://www.gulflink.osd.mil).

### **Early 1990**

Five viruses are investigated for their potential use as biological weapons at the Foot and Mouth Disease Center at al-Manal. [Note: the 5 include: Congo-Crimean hemorrhagic virus, yellow fever virus, enterovirus 17, human rotavirus and camelpox virus. The first 2 were determined to be unsuitable as a biological weapon, but the final 3 were researched further.]

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, Vol. 278, No. 5, 6 August 1997, pp. 418-424.

### **Early - mid 1990**

A crash program is developed under the order of Hussayn Kamil for Project 144 to produce 75 chemical and biological warheads.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

### **1990**

According to Iraqi declarations, aflatoxin is produced at al-Fudhaliyah (al-Safa`h). UNSCOM officials believe the start date to be September 1990 due to testimonials. The al-Hakam report states 2200L of aflatoxin are produced but does not provide a location.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

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**1990**

Project 144 (the unit in charge of production of the al-Hussayn missiles) is asked to create a "kinetic energy" warhead and "special warheads" capable of delivering chemical and biological payloads.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000).

**1990**

The al-Muthanna State Establishment receives a shipment of 100 al-Hussayn missiles, some of which may have been enhanced to double their 300km range but range enhancement would mean a reduced payload capacity (original capacity is 1 metric ton). 25 of the 100 are fitted with biological warheads - 13 with botulinum toxin, 10 with aflatoxin and 2 with anthrax. All 25 missiles are deployed - 10 in a railway tunnel and 15 along the Tigris River.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, Vol. 278, No. 5, 6 August 1997, pp. 418-424.

**1990**

A total of 200 R-400 (400lb) biological bombs are produced. Deployed at two sites, the weapons are ready for immediate use. 100 are filled with botulinum toxin, 50 with *B. anthracis* and 7 with aflatoxin. The few 155-mm caliber artillery shells filled with ricin are designated for field testing.

[Note: "reportedly tests did not go well and no further attempts were made to develop artillery shells for biological warfare."]

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, Vol. 278, No. 5, 6 August 1997, pp. 418-424.

**1990**

According to Iraqi claims, crops infected with wheat cover smut are burned at Fudaliyah.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past As Future?" *Journal of the American Medical Association (JAMA)*, Vol. 278, No. 5, 6 August 1997, p. 419.

**1990**

Iraqi scientists investigate the ability of certain fungi to produce tricothecene mycotoxins. They claim to have produced 20mL of a solution containing tricothecene, some of which was tested on animals.

[Note: the fungi used were *Fusarium oxysporium* and *Fusarium granarium*.]

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, Vol. 278, No. 5, 6 August 1997, pp. 418-424.

**1990**

340L of *Clostridium perfringens* solution is produced at al-Hakam.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, 6 August 1997, pp. 418-424.

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### 1990

100 al-Hussayn missiles are shipped to the al-Muthanna State Establishment. Of these, 25 fitted with biological warheads: 13 filled with botulinum toxin, 10 with aflatoxin, and 2 with anthrax. All of them were reportedly deployed: 10 in a deep railway tunnel and 15 in holes dug along the Tigris River.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past As Future?" *Journal of the American Medical Association (JAMA)*, Vol. 278, No. 5, 6 August 1997, p. 420.

### 1990

Iraq modifies a MIG-21 fighter plane to be a remotely piloted vehicle and equips it with a 2200-L tank and a spray mechanism.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past As Future?" *Journal of the American Medical Association (JAMA)*, Vol. 278, No. 5, 6 August 1997, p. 420.

### 1990

Iraq produces 200 R-400 biological bombs, 100 filled with botulinum toxin, 50 with anthrax, and 7 with aflatoxin.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past As Future?" *Journal of the American Medical Association (JAMA)* Vol. 278, No. 5, 6 August 1997, p. 420.

### 1990

Iraq begins research into viruses and genetic engineering.

—Christian Seelos, "Lessons from Iraq on Bioweapons," *Nature*, Issue 398, 18 March 1999, p. 188.

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## 1999-1990

### 25 October 1999

*U.S. News & World Report* reports that intelligence sources are concerned about the presence of two Russians at a pesticide plant in the al-Saklawiyah region in the western al-Anbar province in Iraq. The Russians, who identify themselves as civilian agricultural advisers, are reportedly former subordinates of retired Gen. Anatoly Kuntsevich, the former deputy commander of the Russian Army Chemical Corps, and are experts in third generation nerve agents, "the Novichoks".

—Richard Z. Chesnoff with Douglas Pasternak, "A Mystery At a Pesticide Plant," *U.S. News & World Report*, 25 October 1999, p. 42.

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## 1989-1980

### 1989-1990

Iraq claims in its declaration to the U.N. that botulinum toxin is produced on an industrial scale. 20,000L of solution

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containing botulinum toxin is manufactured at al-Hakam and al-Manal. 12,000L is used to fill warheads or for testing while the remaining 8000L is stored at al-Hakam.

[Note: the *Clostridium botulinum* strain was imported from the United States. The strength of the solution is unknown.]

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

#### **November-December 1989**

Iraq carries out static and dynamic field trials using a *B. anthracis* simulant, botulinum toxin and aflatoxin in Sakr-18 122mm rockets and R400 bombs at Muhammadiyat.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>; *Jane's Defense Weekly*, 21 August 1996; U.S. Intelligence Community, *Intelligence Related to Possible Sources of Biological Agent Exposure During the Persian Gulf War*, August 2000, [www.gulflink.osd.mil](http://www.gulflink.osd.mil). This report provides the conclusions of the Intelligence Community's Persian Gulf War Illness Task Force.

#### **September 1989**

Iraq conducts open air testing at Jurf al-Sakr Firing Range using 155mm artillery shell filled with ricin.

—U.S. Intelligence Community, *Intelligence Related to Possible Sources of Biological Agent Exposure During the Persian Gulf War*, August 2000, [www.gulflink.osd.mil](http://www.gulflink.osd.mil). This report provides the conclusions of the Intelligence Community's Persian Gulf War Illness Task Force.

#### **August 1989**

Work on *Clostridium perfringens* is transferred from al-Salman Pak to al-Hakam.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **May 1989**

Iraq begins to produce *B. anthracis* for weapons purposes begins at al-Hakam.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **April 1989**

Iraq begins to produce botulinum toxin for weapons purposes on an industrial scale at al-Hakam.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **Around March 1989**

Iraq begins to produce *Bacillus anthracis* at al-Salman Pak.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **January 1989**

According to unnamed U.S. and Israeli sources, Iraq has been engaged for more than a year in producing and

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stockpiling typhoid, cholera and anthrax causing agents in the secret laboratory at al-Salman Pak.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control*, Vol. 14, No. 3, December 1993, p. 240.

#### **1989**

At al-Salman Pak, 10L of concentrated ricin solution is manufactured.

[Note: the majority of the toxin is unaccounted for - some was used for testing and some as payload in artillery shells but the rest is unknown.]

[Note: Iraqi declarations claim that research on ricin began in 1989 - UNSCOM officials believe the research started in 1988]

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, 6 August 1997, pp. 418-424 (8); UNSCOM Report to the Security Council, 25 January 1999, Annex C.

#### **1989**

Research findings from al-Salman Pak are applied at the al-Hakam Single Cell Protein Production Plant in order to begin mass production of anthrax.

[Note: al-Hakam Single Cell Protein Production Plant was Iraq's major production facility for biological warfare agents. Eventually 8000L of anthrax solution was produced. 6000L were used to fill weapons the rest remained in storage at al-Hakam].

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, 6 August 1997, pp. 418-424.

#### **1989**

The Iraqi State Enterprise for Pesticide Production (SEPP) purchases microbiological fermenters and fluid culture media from a Hamburg firm, Water Engineering Trading.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 240.

#### **1989**

The Iraqi Ministry of Defense buys more than 100 items from German biotechnology supply firms, including culture media, heating equipment, and systems for freeze-drying bacteria and toxins.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 240.

#### **1989**

Iraq begins to produce aflatoxin at al-Salman Pak. Eventually 2200L of solution will be manufactured here.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, 6 August 1997, pp. 418-424.

#### **1989**

Iraq begins mass production of anthrax at the al-Hakam Single Cell Protein Production Plant.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past As Future?" *Journal of the American Medical*

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*Association (JAMA)*, Vol. 278, No. 5, 6 August 1997, p. 419; Bruce W. Nelan, "Germ Warfare," *Time*, 1 December 1997, p. 55.

#### **1989**

Iraq scales up *B. anthracis* development to production. According to Iraq, it uses 185kg of yeast extract for the production.

—Dany Shoham, "Iraq's Biological Warfare Agents: A Comprehensive Analysis," *Critical Review in Microbiology*, Vol. 26, No. 3, 2000, p. 182.

#### **1989**

Iraq buys standard spray dryers (which turn germ-laden slurries into dry powder) from the Niro Atomiser Company of Denmark. Later Iraq admits that one dryer was installed at al-Hakam in 1992. The other was found in 1997 at a warehouse at a town in northern Iraq.

—Al J. Venter, "New-Era Threat: Iraq's Biological Weapons," *Middle East Policy*, Vol. 6, No. 4, 4 June 1999, p. 111; Jeffrey Smith, "Iraq's Drive for a Biological Arsenal," *Washington Post*, 21 November 1997.

#### **1989**

Aflatoxin production for biological weapons purposes is moved to a facility at Fudaliyah. The facility is used for aflatoxin production in flasks from April/May 1990 to December 1990. Iraq declared the production of about 1,850L of toxin in solution at Fudaliyah.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **1989**

Research into *Clostridium perfringens* is transferred to al-Hakam.

—Anthony H. Cordesman, "Iraq's Past and Future Biological Weapons Capabilities," *CSIS Middle East Dynamic Net Assessment*, 17 February 1998, p. 7.

#### **1989**

Iraq uses the 150L fermenter, which was transferred from al-Muthanna to al-Salman Pak to produce *Bacillus subtilis*.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **1988-1989**

Iraq tests bombs and rocket shells loaded with botulinum toxin, the carcinogen aflatoxin and *Bacillus subtilis*.

—Louis Meixler, "U.N. Report: Iraq Mised Weapons Monitors," *Associated Press*, 11 October 1995.

#### **End 1988**

Iraq conducts initial production fermentation studies with anthrax at al-Salman Pak using 7 and 14L laboratory-scale fermenters.

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—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **November 1988**

Two 1,850L, and seven 1,480L fermenters are transferred from Veterinary Research Laboratories to al-Hakam.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **October 1988**

The 450L fermenter line in al-Taji, which is used for the production of botulinum toxin, is transferred to al-Hakam.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **September 1988**

The ATCC, of Manassas, VA, ships four *Bacillus anthracis* strains, one strain of *Clostridium botulinum*, and three strains of *Clostridium perfringens* to Iraq.

—"A Look at US Shipments of Pathogens to Iraq," *USA Today*, 30 September, 2002.

#### **September 1988**

Dlawir Ala'Aldiin, a Kurdish microbiologist and a doctor at the University of Nottingham Hospital and medical School in England, accuses Iraq of starting an outbreak of typhoid fever in the Kurdish city of Sulaimaniya.

[Note: substantiation of claim is not known.]

—Judith Miller, "Iraq Accused: A Case of Genocide," *New York Times Magazine*, 3 January 1993, p. 33.

#### **September 1988**

Construction of the production buildings at al-Hakam are completed and work commences on erection of the laboratory buildings.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **August 1988**

Iraq successfully field-tests the Zubaidy devices and other aerosol generators to spray *Bacillus subtilis* spores at Khan Bani Saad.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org); U.S. Intelligence Community, *Intelligence Related to Possible Sources of Biological Agent Exposure During the Persian Gulf War*, August 2000, [www.gulflink.osd.mil](http://www.gulflink.osd.mil). This report provides the conclusions of the Intelligence Community's Persian Gulf War Illness Task Force.

#### **20 August 1988**

Cease-fire in Iran-Iraq war comes into fruition, to be monitored by the U.N. Iran-Iraq Military Observer Group (UNIIMOG).

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### **22 May 1988**

Iraq starts studies on aflatoxin at al-Salman Pak with the appointment of Dr. Emad.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

### **April 1988**

Iraq adds new agents to the bacterial research work at al-Salman Pak in addition to anthrax and botulinum toxin. This includes *Clostridium perfringens*, the bacteria responsible for gas gangrene.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>; Rolf Ekeus, "Beware Iraq's Biowar legacy," *Jane's International Defense Review*, June 1996, p. 104.

### **March 1988**

Iraq is said to conduct its first and second biological weapons field trials at al-Muthanna's weapons test range, Muhammadiyat. The agents tested included *Bacillus subtilis*, a simulant for *Bacillus anthracis*, and botulinum toxin. The munitions included LD-250 bombs.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>; U.S. Intelligence Community, *Intelligence Related to Possible Sources of Biological Agent Exposure During the Persian Gulf War*, August 2000, [www.gulflink.osd.mil](http://www.gulflink.osd.mil). This report provides the conclusions of the Intelligence Community's Persian Gulf War Illness Task Force.

### **24 March 1988**

Al-Hakam is acquired as a new biological weapons production site. The project is given the designator of "324."

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>; Official Iraqi Document, September 1997.

### **February or March - September/October 1988**

The production of botulinum toxin commences at al-Taji with a workforce of eight people, using one 450-liter fermenter.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

### **Early 1988**

Al-Hazen Institute is first identified and linked to al-Salman Pak biological warfare facility.

—*Iraq's Biological Weapon Sites and Facilities*, Center for Nonproliferation Studies, Monterey Institute of International Studies, July 1999, pp. 10-11.

### **Early 1988**

Iraq begins weaponization of biological warfare agents. Senior scientists from the biological weapons program at the Technical Research Center are sent to munitions factories to familiarize themselves with this aspect. It is also agreed that the al-Muthanna State Establishment, due to its experience in the weaponization of chemical agents,

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will provide the necessary assistance for the selection of weapons types and the conduct of field trials.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

### **Early 1988**

Iraq's Special Security Organization (SSO) produces a report estimating Israel's non-conventional weapon capabilities. The report recommends that Iraq be prepared to retaliate, specifically with biological weapons. These recommendations lead to Iraq establishing its BW arsenal as a strategic deterrent and "prompted the so-called Thunderstrike option." The Thunderstrike option requires a massive retaliatory attack against Israeli cities using chemical and biological warheads mounted on long-range ballistic missiles.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

### **1988**

Young wheat plants growing near the town Mosul are infected with wheat cover smut. Iraq harvests the infected wheat and moves it for storage at Fudaliyah.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past As Future?" *Journal of the American Medical Association (JAMA)*, Vol. 278, No. 5, 6 August 1997, p. 419.

### **1988**

Biological warfare activities are expanded. This is evident through the recruitment of personnel and documented activity.

— Official Iraqi Document; UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### **1988**

The CDC sent bacteria samples to Iraq's Sera and Vaccine Institute in Amiriyah. The Institute stored the samples as well as conducted genetic engineering research for the biological weapons program.

—"A Look at US Shipments of Pathogens to Iraq", *USA Today*, 30 September, 2002.

### **1988**

Iraq conducts static trials using LD-250 aerial bombs to disperse BW agents.

—Al J. Venter, "Missing in Iraq: The UN Charts Saddam's Lethal Inventory," *Jane's International Defense Review*, May 1999, p. 35.

### **1988**

Iraq starts research on ricin at al-Salman Pak at the request of an Internal Security Officer. Despite Iraqi claims that research on ricin did not begin until 1989, UNSCOM officials believe it began during 1988.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C; UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

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**1988**

Iraq allegedly unsuccessfully tries to order biological agents directly from Britain's military research center at Porton Down.

—Jeffrey Smith, "Iraq's Drive for a Biological Arsenal," *Washington Post*, 21 November 1997.

**1988**

Iraq orders 1,325-gallon fermenter to grow culture from the Swiss company Chemap and arranges to buy several more. The U.S. and its allies persuade Switzerland to drop the sale.

—William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998.

**1988**

Firial al-Saidi, an Iraqi scientist who had studied bacteriology at Birmingham University (U.K.) in the early 1980s, arrives on the day of her former tutor's funeral, claiming she has been collaborating with him on writing various papers. During her visit she attempts to obtain a number of pathogenic cultures from the British Public Health Science laboratory in London. One of the requests was for botulinum toxin. These actions lead to a formal complaint by a former colleague. Saidi had already returned to Baghdad when the complaint is made.

—Lucy Johnson and Jonathan Calvert, "Iraqi Had Access to Toxins in Britain," *Washington Times*, 24 November 1997; Lucy Johnston, Jonathan Calvert and David Connett, "The Inquisitive Iraqi Student and Tutor with a Fridge Full of Anthrax and Plague," *The Observer*, 23 November 1997; Anthony H. Cordesman, "Iraq's Past and Future Biological Weapons Capabilities," *CSIS Middle East Dynamic Net Assessment*, 17 February 1998, p. 5.

**1988**

An order of almost 40 tons of non-specified growth media is delivered by the Oxoid firm in Bedford, England, and the Swiss firm Fluka Chemie.

—Al J. Venter, "New-Era Threat: Iraq's Biological Weapons," *Middle East Policy*, Vol 6, No. 4, 4 June 1999, p. 111; Jeffrey Smith, "Iraq's Drive for a Biological Arsenal," *Washington Post*, 21 November 1997.

**1988**

Hussayn Kamil takes over the biological weapons program.

—According to Rod Barton, Former principal biological inspector with UNSCOM and Former Director of Proliferation Studies, Australian Department of Defence, at a talk he gave at the Center for Nonproliferation Studies, Monterey Institute of International Studies, Washington DC, 2 February 2001.

**Late 1980s**

Iraq weaponizes *Clostridium perfringens*.

—Scott Ritter, *Endgame: Solving the Iraq Problem - Once and for All*, (New York: Simon & Schuster, 1999), p. 163.

**Late 1980s**

Some Iraqi students, who became leading figures in Iraq's biological weapons program, attend British universities. Some students allegedly attempt to acquire materials that could be used in biological warfare.

—Lucy Johnson and Jonathan Calvert, "Iraqi Had Access to Toxins in Britain," *Washington Times*, 24 November

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1997; Lucy Johnston, Jonathan Calvert and David Connett, "The Inquisitive Iraqi Student and Tutor with a Fridge Full of Anthrax and Plague," *The Observer*, 23 November 1997.

### **1987**

Field trials begin using munitions containing anthrax stimulant and botulinum toxin [Note: the Iraqi declarations to the U.N. state that weapons test planning did not begin until 1988. UNSCOM officials disagree and believe planning began as early as 1986 with detailed planning beginning 1987].

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78; FFCD; UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### **Late 1987**

Botulinum toxin is produced for weapon testing

[Note: UNSCOM states that there is no documentation on the output of botulinum toxin but that the August acquisition of al-Taji indicates prior planning for weapons].

— *Full, Final and Complete Disclosure of Iraq's Past Biological Programme*, September 1997; UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### **1987**

Pilot and industrial scale production of BW agents begins in Iraq. However, Iraq denies developing weapons capable of delivering the agents.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### **1987**

Anthrax research is transferred from the principal Iraqi chemical weapons facility, al-Muthanna State Establishment, to al-Salman Pak.

[Note: al-Salman Pak became the center for biological warfare research and development.]

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, Vol. 278, No. 5, 6 August 1997, pp. 418-424.

### **1987**

Administratively the Iraqi BW program is placed under the control of the Technical Research Center, within the Special Security Organization (SSO). Lt. Gen. Hussayn Kamil Hassan, Director of the SSO, orders construction of biological research facilities complete with an aerosol test chamber used to study the affects of BW agents on sheep, donkeys, monkeys and dogs. In addition, BW research is transferred from al-Muthanna to al-Salman.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78; *Full, Final and Complete Disclosure of Iraq's Past Biological Programme*, September 1997.

### **1987**

The Iraqi Ministry of Defense publishes a second manual, *Principles of Using Chemical and Biological Agents in Warfare*. In the section on military use of biological agents, the manual provides instruction as to how small

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attacks and sabotage operations can be completed before a general offensive begins. This suggests that Iraqi military considers the possibility of covert biological weapons use behind enemy lines.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

#### **End 1987**

Iraq produces botulinum toxin for weapons tests.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

#### **End 1987**

The Technical Research Center submits a report to the Military Industrial Commission (MIC) on the success of the biological weapons work. As a result, Iraq decides to enter a full-scale production phase.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **August 1987**

The Technical Research Center (TRC) takes over the former single-cell protein plant at al-Taji, which becomes operational in 1988.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

#### **June 1987**

Tariq al-Zubaidy, a clinical scientist in the health area, is brought to al-Salman Pak to work on the development a dispersal device for BW agents, which turns to be the Zubaidy Device; a helicopter-borne aerosol generator.

—Based on a conversation with a former UNSCOM inspector, 26 February 2001.

#### **May 1987**

Iraq transfers the biological weapons program, including research on anthrax, from the al-Muthanna State Establishment to al-Salman Pak. A biological weapons research group is established at al-Salman Pak.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past As Future?" *Journal of the American Medical Association (JAMA)*, Vol. 278, No. 5, 6 August 1997, pp.418-419; UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu> (9/26/00).

#### **1987**

Iraq initiates a full-scale production of biological weapons agents.

—*Jane's Defense Weekly*, 21 August 1996, citing ACDA's report; U.S. Intelligence Community, *Intelligence Related to Possible Sources of Biological Agent Exposure During the Persian Gulf War*, August 2000, [www.gulflink.osd.mil](http://www.gulflink.osd.mil). This report provides the conclusions of the Intelligence Community's Persian Gulf War Illness Task Force.

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**1987**

Iraq is thought to have initiated work with trichothecene mycotoxins. Iraq declared that work started in March 1990.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

**1987**

Iraq conducts aerosol dissemination studies at al-Muthanna and al-Salman Pak with both dry and liquid forms of agents.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

**1987**

Iraq imports 2.7 grams of mycotoxins from a German firm.

—Obtained from the "Iraq Watch" project of the Wisconsin Project on Nuclear Arms Control, [www.iraqwatch.org](http://www.iraqwatch.org).

**3 August 1986**

According to an Iraqi government memorandum, General Dayya Abd-al-Wahab 'Izzat, commander of the Erbil Division, instructs all division units to take a semi-annual inventory of all "biological and chemical materials." U.S. intelligence analysts who examined the document concluded it was genuine.

—A document obtained by Middle East Watch from the Kurdistan Democratic Party. Human Rights Watch in a letter to Rolf Ekeus, Chairman of UNSCOM, 29 December 1992; Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Contemporary Security Policy*, Vol. 14, No. 3, December 1993, p. 239.

**1986**

Iraq orders 24 pathogens including 13 bacteria designated as posing substantial risk to public health or crops. The shipment includes specific strains of bacteria causing anthrax, botulism, and gas gangrene. It is sent to the University of Baghdad and secretly paid for by the military.

—Jeffrey Smith, "Iraq's Drive for a Biological Arsenal," *Washington Post*, 21 November 1997; "A look at US Shipments of Pathogens to Iraq", *USA Today*, 30 September, 2002.

**1986**

The Genetic Engineering and Biotechnology Research Center opens. It ostensibly focuses on civilian applications of recombinant-DNA technology.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Contemporary Security Policy*, Vol. 14, No. 3, December 1993, p. 240.

**1986**

The Iraqi government purchases samples of four trichothecene mycotoxins, ostensibly for "laboratory analyses." According to *Der Spiegel* the deal is brokered by Kosef Kuhn, the head of a West German export firm and a suspected Iraqi agent. He purchases the toxins from Sigma-Chemie in Munich, a subsidiary of a St. Louis-based U.S. company, that manufactures specialty biochemicals for research institutions.

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—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Contemporary Security Policy*, Vol. 14, No. 3, December 1993, p. 239.

#### 1986

The State Enterprise and Pesticide Production (SEPP) purchases a 150L fermenter and installs it in al-Salman Pak.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 238.

#### 1986

Literature studies of various pathogens begin. Among the biological agents researched are *B. anthracis*, *Clostridium perfringens*, potent toxins (botulinum toxin, aflatoxin, ricin, and trichothecene mycotoxins), an anti-crop agent (wheat cover smut) and incapacitating animal diseases (hemorrhagic conjunctivitis, rota-virus and camel pox). Scientists ordered seed cultures from commercial laboratories in France and the United States.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

#### 1985

Research on a fungal strain causing wheat cover smut is conducted at al-Salman Pak. It is found to be lethal to the crop if spores are sprayed over immature wheat plants.

[Note: see 1988 for use of wheat cover smut].

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, Vol 278, No. 5, 6 August 1997, pp. 418-424.

#### Mid-1980s

Iraq's Education Ministry orders 70 packages of microbes and toxins from the American Type Culture Collection (ATCC), a non-profit in Rockville, Maryland. The organization had shipped up to 36 strains of 10 pathogens to Iraq, including *B. anthracis*, the organism that causes anthrax, and *Clostridium botulinum*, the organism that causes botulism. All of the shipments between 1985 and 1989 were approved by the Commerce Department. According to one analyst, an order from 1986 included *Clostridium Perfringens*, the causative agent for gas gangrene.

—Bruce W. Nelan, "Germ Warfare," *Time*, 1 December 1997, p.55; William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998; Kevin Merida and John Mintz, "Rockville Firm Shipped Germ Agents to Iraq, Riegler Says," *Washington Post*, 10 February 1994, p. A8; Anthony H. Cordesman, "Iraq's Past and Future Biological Weapons Capabilities," *CSIS Middle East Dynamic Net Assessment*, 17 February 1998, p. 5.

#### 1985

According to one Iraqi defector about 50 prisoners are shipped al-Salman Pak for subjection to biological experiments.

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda*, New York: Scribner, 2000, p. 199.

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**1985**

The al-Muthanna State Establishment (MSE), Iraq's main chemical weapons facility, recommends the commencement of a biological weapons program. In May or June it seeks and obtains an endorsement for the program from the Ministry of Defense. Al-Muthanna purchases one 150-liter fermenter and recruits personnel; and, by the end of the year, a staff of 10 people is working on BW research.

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

**1985**

Iraq's biological warfare program accelerates. Research on anthrax is initiated at al-Muthanna State Establishment. Additional biological warfare staff is appointed to al-Muthanna.

—Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *The Journal of the American Medical Association*, 6 August 1997, Vol. 278, Issue. 5, pp. 418-424; Official Iraqi Document, September 1997.

**1985**

Dr. Rihab Taha is appointed to lead a small BW research team at al-Mathanna until 1987.

—*Iraq's Weapons of Mass Destruction: The Assessment of the British Government*. 2002, p. 11-12.

**1985**

Iraq resurrects its BW program, initially under the umbrella of the chemical weapons program. The resurrection of the program is attributed to General Nizar Attar, who was the Director General of the al-Muthanna State Establishment (MSE), the State Organization for Technical Industries (SOTI) and the Ministry of Defense. Iraq also commences the final phase of military research on several strains of *B. anthracis*. In mid-1987, the group of biology researchers moves to al-Salman Pak, where it operates within an organization related to Iraq's security apparatus. Later, in 1988-89 the group moves to the al-Hakam factory.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org); Christian Seelos, "Lessons from Iraq on Bioweapons," *Nature*, Vol. 398, 18 March 1999, p. 187; Dany Shoham, "Iraq's Biological Warfare Agents: A Comprehensive Analysis," *Critical Review in Microbiology*, Vol. 26, No. 3, 2000, p. 181.

**1984**

Iraq starts research on wheat cover smut at al-Salman Pak.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org).

**1984**

Iraq acquires eight mobile laboratories from the German firm Iveco Magirus AG.

—Obtained from the "Iraq Watch" project of the Wisconsin Project on Nuclear Arms Control, 24 April 2000, [www.iraqwatch.org](http://www.iraqwatch.org).

**1984**

Col. Sameem Jalal Abdul Latif, a member of the training department of the Chemical Corps Section of the Iraqi

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Armed Forces, publishes a military manual on "Chemical, Biological and Nuclear Operations." The manual includes a detailed analysis of biological warfare. Included in this manual is a discussion on how non-lethal doses of biological agents can overburden and destroy morale of enemy troops. Latif concludes that the Iraqi General Staff would have to study the possibilities of delivering biological agents with available weapons systems.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control* Vol. 14, No. 3, December 1993, p. 238; Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

### 1983

Iraq begins a project known as "presidential priority." The project allegedly is created after a secret paper is presented by Abdul Nassir al-Hindawi, to the Iraqi leadership explaining how large-scale biological agent production could serve as an antipersonnel weapon against Iran.

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), pp. 47-78.

### 1983

Abdul Nassir Hindawi, an Iraqi microbiologist, writes a secret report for top officials in the Iraqi Ba`th (also cited as Baath) Party outlining how the biological program could be turned into a military asset with large-scale production. According to Iraqi officials, the report had a huge impact, and within a year the regime ordered creation of a separate biological weapons research complex at al-Muthanna. In 1997 Iraq told UNSCOM that "the perceived objectives [of the biological weapons program] were to produce a viable deterrent in answer to a possible attack by Israel using nuclear weapons."

—Judith Miller, "Baghdad Arrests A Germ Specialist," *New York Times*, 24 March 1998, pp.A1, A11; Jeffrey Smith, "Iraq's Drive for a Biological Arsenal," *Washington Post*, 21 November 1997.

### 1983

Biological warfare program is part of al-Muthanna objectives.

[Note: This is based on an interview of the director of al-Muthanna, Lt. General Nizar Attar and UNSCOM officials. Although not provided with documentation to support the claim, UNSCOM agrees the information is probably correct. Note also that al-Muthanna had only a chemical warfare program until this time.]

—Official Iraqi Document *Full, Final and Complete Disclosure of Iraq's Past Biological Programme*, September 1997.

### As early as 1983

Iraqi scientists, under Saddam Hussayn's orders, use strains of agents causing of botulism, anthrax, and salmonella in weapons tests, according to the *Observer*, quoting an Iraqi scientist who defected to Iran. He said: "I know they experimented on sheep with clostridium botulism (sic) type C." In 1983 Iraqi scientists also overcome the problem of ensuring the toxin was not destroyed at the time of detonation by the bomb or artillery shell.

—"Saddam Hides Germ Warfare Tests From UN Inspectors," *The Observer*, 9 August 1992, p.1; in FBIS Document

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JPRS-TND-92-007-L, 10 September 1992); Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control* 14(3), December 1993, p. 237.

### **June 1981**

Saddam Hussayn addresses his cabinet, arguing that Israel's reason for attacking the Iraqi Osirak (also spelled Osiraq) nuclear reactor was *not* because it was allegedly developing nuclear weapons but because Iraq is a front-line Arab nation showing progress and developing its technology base. Hussayn emphasizes that the key to victory in the Arab-Israeli conflict will be to develop its own scientific potential, economy and self-confidence. He argues that the attack on Osirak was an Israeli attempt to destroy Iraq's high-technology facility as well as to dictate the terms of the Arab-Israeli relationship. Hussayn continues his speech by calling upon any nation not wanting Arab nations subjugated to foreign forces to develop nuclear weapons.

[Note: The conclusion that can be drawn from this speech is that Iraq's acquisition of unconventional (specifically nuclear) weapons will create a deterrence between Israel and the Arabs similar to the Cold War deterrence between the United States and the Soviet Union. While Hussayn refers specifically to "atomic weapons," it is important to remember that the main motivation of acquiring these weapons is to deter Israel and it is probable that any weapon that could achieve this goal would seem a viable option]

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Cornell University Press, 2000), p. 57.

### **1980**

The Iraqi government contracts with the West German firm, Thyssen Rheinstahl Technik, for the construction of a biological research laboratory near al-Salman Pak. Another contract with the same company and for the same purpose is signed in 1981. The laboratory is completed in 1983 and becomes the focus of Iraq's biological weapons research and development efforts. The complex is highly secured.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 237.

### **Early 1980s**

Iraq possesses *Bacillus anthracis*, installed on artillery shells.

—Dany Shoham, "Iraq's Biological Warfare Agents: A Comprehensive Analysis," *Critical Review in Microbiology*, Vol. 26, No. 3, 2000, p. 181.

### **1980s**

The U.S. Public Health Service's Center for Disease Control (CDC) ships a virus to an Iraqi microbiologist in Basra, ostensibly for public health research. The virus was an Israeli strain of West Nile encephalitis virus, an agent which had reportedly been subject to a vaccine development effort in Israel funded by the U.S. Army's Biological Defense Research Program.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December, 1993, p. 238.

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### **1980s**

Iraq receives T-2 toxin, HT-2 toxin (the hydrolyzed metabolite of T-2 toxin), diacetoxyscirpenol and verrucarol toxins from a West German representative of the firm Sigma-Chemie.

—Dany Shoham, "Iraq's Biological Warfare Agents: A Comprehensive Analysis," *Critical Review in Microbiology*, Vol. 26, No. 3, 2000, p. 192.

### **1980's**

Iraq obtains 17 types of biological agents from supply houses in the United States and France, including *B. anthracis* and botulinum toxin.

—Philip Shenon, "Iraq Links Germs for Weapons to U.S. and France," *The New York Times*, 16 March, 2003; R. Jeffrey Smith, "Iraq's Drive for a Biological Arsenal; U.N. Pursuing 25 Germ Warheads It Believes Are Still Loaded with Deadly Toxin," *The Washington Post*, 21 November 1997.

### **1980s**

Iraq buys about 10 tons of growth medium for growing bacteria from an unnamed British company.

—William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998.

### **Sept 1980**

Iran-Iraq War begins.

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## **1979-1931**

### **1979-1985**

After the closing of al-Hazen Ibn al-Haytham (apparently as a result of fraud conducted by the chairman and other senior staff members), biological work is continued at al-Salman Pak.

—UNSCOM Report to the Security Council, 25 January 1999, Annex C.

### **Late 1970s**

The Iraqi government contracts with a French company to build a veterinary vaccine plant in the Doura district of Baghdad, with a capacity of producing up to 12 million doses per year of 15 different vaccines.

—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, pp. 236-237.

### **Late 1970s**

Iraq procures T-2 mycotoxin from the U.S. National Institute of Environmental Health Science, Research Triangle Park, N.C., USA.

—Dany Shoham, "Iraq's Biological Warfare Agents: A Comprehensive Analysis," *Critical Review in Microbiology*, Vol. 26 (3), 2000, p. 192.

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### 16 January 1979

According to Iraqi sources, the al Hazen Ibn al-Haytham Institute is shut down and the biological research is terminated. Several staffers, including the Chairman, Major Ghazan Ibrahim, are arrested due to financial fraud. The Institute is closed due to poor management coupled with lack of appropriate facilities and equipment.

[Note: UNSCOM assesses that the biological program continued on a small-scale.]

—According to Rod Barton, Former principal biological inspector with UNSCOM and Former Director of Proliferation Studies, Australian Department of Defence, at a talk he gave at the Center for Nonproliferation Studies, Monterey Institute of International Studies, Washington DC, 2 February 2001; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org); UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu> *Full, Final and Complete Disclosure of Iraq's Past Biological Programme*, September 1997.

### 1976

Iraq begins to obtain virulent clinical isolates of *B. anthracis* of human and animal origin. They are studied with regards to "cultivation, pathogenicity, experimental infection and preservation."

[Note: It is unclear from the source how the *B. anthracis* of human origin was obtained; *B. anthracis* is endemic to Iraq.]

—Dany Shoham, "Iraq's Biological Warfare Agents: A Comprehensive Analysis," *Critical Review in Microbiology*, Vol. 26, No. 3, 2000, p. 181.

### 1975

Iraq establishes research and development biological weapons program at al-Hazen Ibn al-Haithem Institute at a site located the al-Salman peninsula, about 30km southeast of Baghdad.

[Note: The spelling of the institute's name varies in different sources. For instance, UNSCOM labels it as "al-Hazen Ibn al-Haytham". The chronology will use the spelling as indicated in the original source document.]

—Al J. Venter, "Missing in Iraq: The U.N. Charts Saddam's Lethal Inventory," *Jane's International Defense Review*, Vol. 32, No. 5, May 1999, p. 40; UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>.

### 1974-1975

According to Dany Shoham of the Begin-Sadat Center for Strategic Studies in Israel, the production capacity of *Bacillus anthracis* for non-virulent, veterinary vaccines reaches 1.84 million doses per annum and of *Clostridia* bacteria, 8.3 million doses per annum.

—Dany Shoham, "Iraq's Biological Warfare Agents: A Comprehensive Analysis," *Critical Review in Microbiology* Vol. 26 (3), 2000, pp. 181, 183, 189.

### 2 November 1974

The Iraqi minister of agriculture signs a contract with the Paris-based Institute Merieux to set up Iraq's first vaccine production facility at Abu Ghurab.

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—Jonathan Tucker, "Lessons of Iraq's Biological Weapons Programme," *Arms Control Today*, Vol. 14, No. 3, December 1993, p. 236.

#### **1974**

A biological weapons program is initiated by government decree.

[Note: the establishment of the al-Hazen Ibn al-Haytham Institute facility (located at al Salman) would have required the planning and initial stages of the project to begin earlier; also, no decree has been provided - UNSCOM.]

—UNSCOM Eight Report Under Paragraph 8, Security Council Resolution 715 (1991), S/1995/864, 11 October 1995, <http://cns.miis.edu>; UNSCOM Report to the Security Council, 25 January 1999, Annex C: Status of Verification of Iraq's Biological Warfare Programme, [www.fas.org](http://www.fas.org); William J. Broad and Judith Miller, "How Iraq's Biological Weapons Program Came to Light," *New York Times*, 26 February 1998, accessed online; *Full, Final and Complete Disclosure of Iraq's Past Biological Programme*, Submitted to the U.N., September 1997.

#### **1972**

On 10 April 1972, the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction (BWC) opens for signature. Iraq signs the document on 11 May 1972 but does not ratify it.

[Note: Iraq finally ratifies the BWC in April 1991 following its defeat by coalition forces in the first Gulf war.]

#### **1964**

The Iraqi Army Chemical Weapons Branch (CWB) is founded with the responsibilities for planning, transporting, using, and conducting defensive operations against chemical weapons. The CWB commander is also the leader of the Iraqi Chemical Corps.

[Note: The CWB also helps create a biological weapon doctrine.]

—Timothy V. McCarthy and Jonathan B. Tucker, "Saddam's Toxic Arsenal: Chemical and Biological Weapons in the Gulf Wars," in Peter R. Lavoy, Scott D. Sagan and James Wirtz (ed.), *Planning the Unthinkable* (Ithaca and London: Cornell University Press, 2000), p. 62.

#### **8 September 1931**

Iraq accedes to the Geneva protocol, banning the use of chemical weapons. Iraq makes a "no first use reservation," as do approximately 30% of States Parties to the treaty.

—"1925 Geneva Protocol," <http://disarmament.un.org>.

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