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IRAQ'S WEAPONS OF MASS DESTRUCTION

THE ASSESSMENT OF THE BRITISH
GOVERNMENT

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FOREWORD BY THE PRIME MINISTER, THE RIGHT HONOURABLE TONY BLAIR MP

The document published today is based, in large part, on the work of the Joint Intelligence Committee (JIC). The JIC is at the heart of the British intelligence machinery. It is chaired by the Cabinet Office and made up of the heads of the UK's three Intelligence and Security Agencies, the Chief of Defence Intelligence, and senior officials from key government departments. For over 60 years the JIC has provided regular assessments to successive Prime Ministers and senior colleagues on a wide range of foreign policy and international security issues.

Its work, like the material it analyses, is largely secret. It is unprecedented for the Government to publish this kind of document. But in light of the debate about Iraq and Weapons of Mass Destruction (WMD), I wanted to share with the British public the reasons why I believe this issue to be a current and serious threat to the UK national interest.

In recent months, I have been increasingly alarmed by the evidence from inside Iraq that despite sanctions, despite the damage done to his capability in the past, despite the UN Security Council Resolutions expressly outlawing it, and despite his denials, Saddam Hussein is continuing to develop WMD, and with them the ability to inflict real damage upon the region, and the stability of the world.

Gathering intelligence inside Iraq is not easy. Saddam's is one of the most secretive and dictatorial regimes in the world. So I believe people will understand why the Agencies cannot be specific about the sources, which have formed the judgements in this document, and why we cannot publish everything we know. We cannot, of course, publish the detailed raw intelligence. I and other Ministers have been briefed in detail on the intelligence and are satisfied as to its authority. I also want to pay tribute to our Intelligence and Security Services for the often extraordinary work that they do.

What I believe the assessed intelligence has established beyond doubt is that Saddam has continued to produce chemical and biological weapons, that he continues in his efforts to develop nuclear weapons, and that he has been able to extend the range of his ballistic missile programme. I also believe that, as stated in the document, Saddam will now do his utmost to try to conceal his weapons from UN inspectors.

The picture presented to me by the JIC in recent months has become more not less worrying. It is clear that, despite sanctions, the policy of containment has not worked sufficiently well to prevent Saddam from developing these weapons.

I am in no doubt that the threat is serious and current, that he has made progress on WMD, and that he has to be stopped.

Saddam has used chemical weapons, not only against an enemy state, but against his own people. Intelligence reports make clear that he sees the building up of his WMD capability, and the belief overseas that he would use these weapons, as vital to his

strategic interests, and in particular his goal of regional domination. And the document discloses that his military planning allows for some of the WMD to be ready within 45 minutes of an order to use them.

I am quite clear that Saddam will go to extreme lengths, indeed has already done so, to hide these weapons and avoid giving them up.

In today's inter-dependent world, a major regional conflict does not stay confined to the region in question. Faced with someone who has shown himself capable of using WMD, I believe the international community has to stand up for itself and ensure its authority is upheld.

The threat posed to international peace and security, when WMD are in the hands of a brutal and aggressive regime like Saddam's, is real. Unless we face up to the threat, not only do we risk undermining the authority of the UN, whose resolutions he defies, but more importantly and in the longer term, we place at risk the lives and prosperity of our own people.

The case I make is that the UN Resolutions demanding he stops his WMD programme are being flouted; that since the inspectors left four years ago he has continued with this programme; that the inspectors must be allowed back in to do their job properly; and that if he refuses, or if he makes it impossible for them to do their job, as he has done in the past, the international community will have to act.

I believe that faced with the information available to me, the UK Government has been right to support the demands that this issue be confronted and dealt with. We must ensure that he does not get to use the weapons he has, or get hold of the weapons he wants.

EXECUTIVE SUMMARY

1. Under Saddam Hussein Iraq developed chemical and biological weapons, acquired missiles allowing it to attack neighbouring countries with these weapons and persistently tried to develop a nuclear bomb. Saddam has used chemical weapons, both against Iran and against his own people. Following the Gulf War, Iraq had to admit to all this. And in the ceasefire of 1991 Saddam agreed unconditionally to give up his weapons of mass destruction.
2. Much information about Iraq's weapons of mass destruction is already in the public domain from UN reports and from Iraqi defectors. This points clearly to Iraq's continuing possession, after 1991, of chemical and biological agents and weapons produced before the Gulf War. It shows that Iraq has refurbished sites formerly associated with the production of chemical and biological agents. And it indicates that Iraq remains able to manufacture these agents, and to use bombs, shells, artillery rockets and ballistic missiles to deliver them.
3. An independent and well-researched overview of this public evidence was provided by the International Institute for Strategic Studies (IISS) on 9 September. The IISS report also suggested that Iraq could assemble nuclear weapons within months of obtaining fissile material from foreign sources.
4. As well as the public evidence, however, significant additional information is available to the Government from secret intelligence sources, described in more detail in this paper. This intelligence cannot tell us about everything. However, it provides a fuller picture of Iraqi plans and capabilities. It shows that Saddam Hussein attaches great importance to possessing weapons of mass destruction which he regards as the basis for Iraq's regional power. It shows that he does not regard them only as weapons of last resort. He is ready to use them, including against his own population, and is determined to retain them, in breach of United Nations Security Council Resolutions (UNSCR).
5. Intelligence also shows that Iraq is preparing plans to conceal evidence of these weapons, including incriminating documents, from renewed inspections. And it confirms that despite sanctions and the policy of containment, Saddam has continued to make progress with his illicit weapons programmes.
6. As a result of the intelligence we judge that Iraq has:
 - continued to produce chemical and biological agents;
 - military plans for the use of chemical and biological weapons, including against its own Shia population. Some of these weapons are deployable within 45 minutes of an order to use them;
 - command and control arrangements in place to use chemical and biological weapons. Authority ultimately resides with Saddam Hussein. (There is intelligence that he may have delegated this authority to his son Qusai);

- developed mobile laboratories for military use, corroborating earlier reports about the mobile production of biological warfare agents;
- pursued illegal programmes to procure controlled materials of potential use in the production of chemical and biological weapons programmes;

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- tried covertly to acquire technology and materials which could be used in the production of nuclear weapons;
 - sought significant quantities of uranium from Africa, despite having no active civil nuclear power programme that could require it;
 - recalled specialists to work on its nuclear programme;

-
- illegally retained up to 20 al-Hussein missiles, with a range of 650km, capable of carrying chemical or biological warheads;
 - started deploying its al-Samoud liquid propellant missile, and has used the absence of weapons inspectors to work on extending its range to at least 200km, which is beyond the limit of 150km imposed by the United Nations;
 - started producing the solid-propellant Ababil-100, and is making efforts to extend its range to at least 200km, which is beyond the limit of 150km imposed by the United Nations;
 - constructed a new engine test stand for the development of missiles capable of reaching the UK Sovereign Base Areas in Cyprus and NATO members (Greece and Turkey), as well as all Iraq's Gulf neighbours and Israel;
 - pursued illegal programmes to procure materials for use in its illegal development of long range missiles;

-
- learnt lessons from previous UN weapons inspections and has already begun to conceal sensitive equipment and documentation in advance of the return of inspectors.

7. These judgements reflect the views of the Joint Intelligence Committee (JIC). More details on the judgements and on the development of the JIC's assessments since 1998 are set out in Part 1 of this paper.

8. Iraq's weapons of mass destruction are in breach of international law. Under a series of UN Security Council Resolutions Iraq is obliged to destroy its holdings of these weapons under the supervision of UN inspectors. Part 2 of the paper sets out the key UN Security Council Resolutions. It also summarises the history of the UN inspection regime and Iraq's history of deception, intimidation and concealment in its dealings with the UN inspectors.

9. But the threat from Iraq does not depend solely on the capabilities we have described. It arises also because of the violent and aggressive nature of Saddam Hussein's regime. His record of internal repression and external aggression gives rise to unique concerns about the threat he poses. The paper briefly outlines in Part 3 Saddam's rise to power, the nature of his regime and his history of regional aggression. Saddam's human rights abuses are also catalogued, including his record of torture, mass arrests and summary executions.
10. The paper briefly sets out how Iraq is able to finance its weapons programme. Drawing on illicit earnings generated outside UN control, Iraq generated illegal income of some \$3 billion in 2001.

PART 1

IRAQ'S CHEMICAL, BIOLOGICAL, NUCLEAR AND BALLISTIC MISSILE PROGRAMMES

CHAPTER 1: THE ROLE OF INTELLIGENCE

1. Since UN inspectors were withdrawn from Iraq in 1998, there has been little overt information on Iraq's chemical, biological, nuclear and ballistic missile programmes. Much of the publicly available information about Iraqi capabilities and intentions is dated. But we also have available a range of secret intelligence about these programmes and Saddam Hussein's intentions. This comes principally from the United Kingdom's intelligence and analysis agencies – the Secret Intelligence Service (SIS), the Government Communications Headquarters (GCHQ), the Security Service, and the Defence Intelligence Staff (DIS). We also have access to intelligence from close allies.
2. Intelligence rarely offers a complete account of activities which are designed to remain concealed. The nature of Saddam's regime makes Iraq a difficult target for the intelligence services. Intelligence, however, has provided important insights into Iraqi programmes and Iraqi military thinking. Taken together with what is already known from other sources, this intelligence builds our understanding of Iraq's capabilities and adds significantly to the analysis already in the public domain. But intelligence sources need to be protected, and this limits the detail that can be made available.
3. Iraq's capabilities have been regularly reviewed by the Joint Intelligence Committee (JIC), which has provided advice to the Prime Minister and his senior colleagues on the developing assessment, drawing on all available sources. Part I of this paper includes some of the most significant views reached by the JIC between 1999 and 2002.

Joint Intelligence Committee (JIC)

The JIC is a Cabinet Committee with a history dating back to 1936. The JIC brings together the Heads of the three Intelligence and Security Agencies (Secret Intelligence Service, Government Communications Headquarters and the Security Service), the Chief of Defence Intelligence, senior policy makers from the Foreign Office, the Ministry of Defence, the Home Office, the Treasury and the Department of Trade and Industry and representatives from other Government Departments and Agencies as appropriate. The JIC provides regular intelligence assessments to the Prime Minister, other Ministers and senior officials on a wide range of foreign policy and international security issues. It meets each week in the Cabinet Office.

CHAPTER 2

IRAQ'S PROGRAMMES: 1971-1998

1. Iraq has been involved in chemical and biological warfare research for over 30 years. Its chemical warfare research started in 1971 at a small, well guarded site at Rashad to the north east of Baghdad. Research was conducted there on a number of chemical agents including mustard gas, CS and tabun. Later, in 1974 a dedicated organisation called al-Hasan Ibn al-Haitham was established. In the late 1970s plans were made to build a large research and commercial-scale

Effects of Chemical Weapons

Mustard is a liquid agent, which gives off a hazardous vapour, causing burns and blisters to exposed skin. When inhaled, mustard damages the respiratory tract; when ingested, it causes vomiting and diarrhoea. It attacks and damages the eyes, mucous membranes, lungs, skin, and blood-forming organs.

Tabun, sarin and VX are all nerve agents of which VX is the most toxic. They all damage the nervous system, producing muscular spasms and paralysis. As little as 10 milligrammes of VX on the skin can cause rapid death.

production facility in the desert some 70km north west of Baghdad under the cover of Project 922. This was to become Muthanna State Establishment, also known as al-Muthanna, and operated under the front name of Iraq's State Establishment for Pesticide Production. It became operational in 1982-83. It had five research and development sections, each tasked to pursue different programmes. In addition, the al-Muthanna site was the main chemical agent production facility, and it also took the lead in weaponising chemical and biological agents including all aspects of weapon development and testing, in association with the military. According to information, subsequently supplied by the Iraqis, the total production capacity in 1991 was 4,000 tonnes of agent per annum, but we assess it could have been higher. Al-Muthanna was supported by three separate storage and precursor production facilities known as Fallujah 1, 2 and 3 near Habbaniyah, north west of Baghdad, parts of which were not completed before they were heavily bombed in the 1991 Gulf War.

2. Iraq started biological warfare research in the mid-1970s. After small-scale research, a purpose-built research and development facility was authorised at al-Salman, also known as Salman Pak. This is surrounded on three sides by the Tigris river and situated some 35km south of Baghdad. Although some progress was made in biological weapons research at this early stage, Iraq decided to concentrate on developing chemical agents and their delivery systems at al-Muthanna. With the outbreak of the Iran-Iraq War, in the early 1980s, the biological weapons programme was revived. The appointment of Dr Rihab Taha in 1985, to head a small biological weapons research team at al-Muthanna,

The effects of biological agents

Anthrax is a disease caused by the bacterium *Bacillus Anthracis*. Inhalation anthrax is the manifestation of the disease likely to be expected in biological warfare. The symptoms may vary, but can include fever and internal bleeding. The incubation period for anthrax is 1 to 7 days, with most cases occurring within 2 days of exposure.

Botulinum toxin is one of the most toxic substances known to man. The first symptoms of poisoning may appear as early as 1 hour post exposure or as late as 8 days after exposure, with the incubation period between 12 and 22 hours. Paralysis leads to death by suffocation.

Aflatoxins are fungal toxins, which are potent carcinogens. Most symptoms take a long time to show. Food products contaminated by aflatoxins can cause liver inflammation and cancer. They can also affect pregnant women, leading to stillborn babies and children born with mutations.

Ricin is derived from the castor bean and can cause multiple organ failure leading to death within one or two days of inhalation.

helped to develop the programme. At about the same time plans were made to develop the Salman Pak site into a secure biological warfare research facility. Dr Taha continued to work with her team at al-Muthanna until 1987 when it moved to Salman Pak, which was under the control of the Directorate of General Intelligence. Significant resources were provided for the programme, including the construction of a dedicated production facility (Project 324) at al-Hakam. Agent production began in 1988 and weaponisation testing and later filling of munitions was conducted in association with the staff at Muthanna State Establishment. From mid-1990, other civilian facilities were taken over and some adapted for use in the production and research and development of biological agents. These included:

- al-Dawrah Foot and Mouth Vaccine Institute which produced botulinum toxin and conducted virus research. There is some intelligence to suggest that work was also conducted on anthrax;
 - al-Fudaliyah Agriculture and Water Research Centre where Iraq admitted it undertook aflatoxin production and genetic engineering;
 - Amariyah Sera and Vaccine Institute which was used for the storage of biological agent seed stocks and was involved in genetic engineering.
3. By the time of the Gulf War Iraq was producing very large quantities of chemical and biological agents. From a series of Iraqi declarations to the UN during the 1990s we know that by 1991 they had produced at least:
- 19,000 litres of botulinum toxin, 8,500 litres of anthrax, 2,200 litres of aflatoxin and were working on a number of other agents;

- 2,850 tonnes of mustard gas, 210 tonnes of tabun, 795 tonnes of sarin and cyclosarin, and 3.9 tonnes of VX.

4. Iraq's nuclear programme was established under the Iraqi Atomic Energy Commission in the 1950s. Under a nuclear co-operation agreement signed with the Soviet Union in 1959, a nuclear research centre, equipped with a research reactor, was built at Tuwaita, the main Iraqi nuclear research centre. The research reactor worked up to 1991. The surge in Iraqi oil revenues in the early 1970s supported an expansion of the research programme. This was bolstered in the mid-1970s by the acquisition of two research reactors powered by highly enriched uranium fuel and equipment for fuel fabrication and handling. By the end of 1984 Iraq was self-sufficient in uranium ore. One of the reactors was destroyed in an Israeli air attack in June 1981 shortly before it was to become operational; the other was never completed.
5. By the mid-1980s the deterioration of Iraq's position in the war with Iran prompted renewed interest in the military use of nuclear technology. Additional resources were put into developing technologies to enrich uranium as fissile material (material that makes up the core of a nuclear weapon) for use in nuclear weapons. Enriched uranium was preferred because it could be more easily produced covertly than the alternative, plutonium. Iraq followed parallel programmes to produce highly enriched uranium (HEU), electromagnetic isotope separation (EMIS) and gas centrifuge enrichment. By 1991 one EMIS enrichment facility was nearing completion and another was under construction. However, Iraq never succeeded in its EMIS technology and the programme had been dropped by 1991. Iraq decided to concentrate on gas centrifuges as the means for producing the necessary fissile material. Centrifuge facilities were also under construction, but the centrifuge design was still being developed. In August 1990 Iraq instigated a crash programme to develop a single nuclear weapon within a year. This programme envisaged the rapid development of a small 50 machine gas centrifuge cascade to produce weapons-grade HEU using fuel from the Soviet research reactor, which was already substantially enriched, and unused fuel from the reactor bombed by the Israelis. By the time of the Gulf War, the crash programme had made little progress.
6. Iraq's declared aim was to produce a missile warhead with a 20-kiloton yield and weapons designs were produced for the simplest implosion weapons. These were similar to the device used at Nagasaki in 1945. Iraq was also working on more

Effect of a 20-kiloton nuclear detonation

A detonation of a 20-kiloton nuclear warhead over a city might flatten an area of approximately 3 square miles. Within 1.6 miles of detonation, blast damage and radiation would cause 80% casualties, three-quarters of which would be fatal. Between 1.6 and 3.1 miles from the detonation, there would still be 10% casualties.

advanced concepts. By 1991 the programme was supported by a large body of Iraqi nuclear expertise, programme documentation and databases and manufacturing infrastructure. The International Atomic Energy Agency (IAEA) reported that Iraq had:

- experimented with high explosives to produce implosive shock waves;
- invested significant effort to understand the various options for neutron initiators;
- made significant progress in developing capabilities for the production, casting and machining of uranium metal.

SCUD missiles

The short-range mobile SCUD ballistic missile was developed by the Soviet Union in the 1950s, drawing on the technology of the German V-2 developed in World War II.

For many years it was the mainstay of Soviet and Warsaw Pact tactical missile forces and it was also widely exported. Recipients of Soviet-manufactured SCUDs included Iraq, North Korea, Iran, and Libya, although not all were sold directly by the Soviet Union.

7. Prior to the Gulf War, Iraq had a well-developed ballistic missile industry. Many of the missiles fired in the Gulf War were an Iraqi modified version of the SCUD missile, the al-Hussein, with an extended range of 650km. Iraq had about 250 imported SCUD-type missiles prior to the Gulf War plus an unknown number of indigenously produced engines and components. Iraq was working on other stretched SCUD variants, such as the al-Abbas, which had a range of 900km. Iraq was also seeking to reverse-engineer the SCUD engine with a view to producing new missiles. Recent intelligence indicates that they may have succeeded at that time. In particular, Iraq had plans for a new SCUD-derived missile with a range of 1200km. Iraq also conducted a partial flight test of a multi-stage satellite launch vehicle based on SCUD technology, known as the al-Abid. Also during this period, Iraq was developing the Badr-2000, a 700-1000km range two-stage solid propellant missile (based on the Iraqi part of the 1980s CONDOR-2 programme run in co-operation with Argentina and Egypt). There were plans for 1200-1500km range solid propellant follow-on systems.

The use of chemical and biological weapons

8. Iraq had made frequent use of a variety of chemical weapons during the Iran-Iraq War. Many of the casualties are still in Iranian hospitals suffering from the long-term effects of numerous types of cancer and lung diseases. In 1988 Saddam also used mustard and nerve agents against Iraqi Kurds at Halabja in northern Iraq (see box on p15). Estimates vary, but according to Human Rights Watch up to 5,000 people were killed.

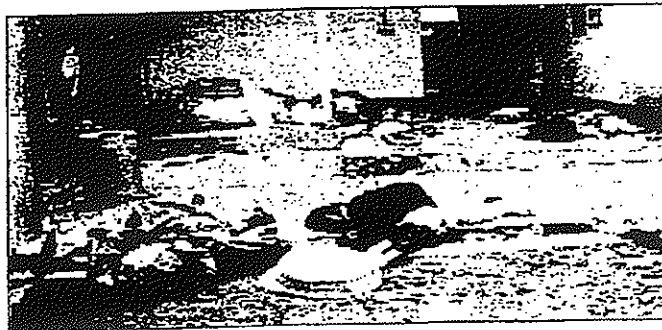
9. Iraq used significant quantities of mustard, tabun and sarin during the war with Iran resulting in over 20,000 Iranian casualties. A month after the attack on Halabja, Iraqi troops used over 100 tonnes of sarin against Iranian troops on the al-Fao peninsula. Over the next three months Iraqi troops used sarin and other nerve agents on Iranian troops causing extensive casualties.

The Attack on Halabja

On Friday 17th March 1988 the village of Halabja was bombarded by Iraqi warplanes. The raid was over in minutes. Saddam Hussein used chemical weapons against his own people. A Kurd described the effects of a chemical attack on another village:

"My brothers and my wife had blood and vomit running from their noses and their mouths. Their heads were tilted to one side. They were groaning. I couldn't do much, just clean up the blood and vomit from their mouths and try in every way to make them breathe again. I did artificial respiration on them and then I gave them two injections each. I also rubbed creams on my wife and two brothers."

(From "Crimes Against Humanity" Iraqi National Congress.)



Among the corpses at Halabja, children were found dead where they had been playing outside their homes. In places, streets were piled with corpses.

10. From Iraqi declarations to the UN after the Gulf War we know that by 1991 Iraq had produced a variety of delivery means for chemical and biological agents including over 16,000 free-fall bombs and over 110,000 artillery rockets and shells. Iraq also admitted to the UN Special Commission (UNSCOM) that it had 50 chemical and 25 biological warheads available for its ballistic missiles.

The use of ballistic missiles

11. Iraq fired over 500 SCUD-type missiles at Iran during the Iran-Iraq War at both civilian and military targets, and 93 SCUD-type missiles during the Gulf War. The latter were targeted at Israel and Coalition forces stationed in the Gulf region.
12. At the end of the Gulf War the international community was determined that Iraq's arsenal of chemical and biological weapons and ballistic missiles should be dismantled. The method chosen to achieve this was the establishment of UNSCOM to carry out intrusive inspections within Iraq and to eliminate its chemical and biological weapons and ballistic missiles with a range of over 150km. The IAEA was charged with the abolition of Iraq's nuclear weapons programme. Between 1991 and 1998 UNSCOM succeeded in identifying and destroying very large quantities of chemical weapons and ballistic missiles as well as associated production facilities. The IAEA also destroyed the infrastructure for Iraq's nuclear weapons programme and removed key nuclear materials. This was achieved despite a continuous and sophisticated programme of harassment, obstruction, deception and denial (see Part 2). Because of this UNSCOM concluded by 1998 that it was unable to fulfil its mandate. The inspectors were withdrawn in December 1998.
13. Based on the UNSCOM report to the UN Security Council in January 1999 and earlier UNSCOM reports, we assess that when the UN inspectors left Iraq they were unable to account for:
 - up to 360 tonnes of bulk chemical warfare agent, including 1.5 tonnes of VX nerve agent;
 - up to 3,000 tonnes of precursor chemicals, including approximately 300 tonnes which, in the Iraqi chemical warfare programme, were unique to the production of VX;
 - growth media procured for biological agent production (enough to produce over three times the 8,500 litres of anthrax spores Iraq admits to having manufactured);
 - over 30,000 special munitions for delivery of chemical and biological agents.
14. The departure of UNSCOM meant that the international community was unable to establish the truth behind these large discrepancies and greatly diminished its ability to monitor and assess Iraq's continuing attempts to reconstitute its programmes.

CHAPTER 3

THE CURRENT POSITION: 1998–2002

1. This chapter sets out what we know of Saddam Hussein's chemical, biological, nuclear and ballistic missile programmes, drawing on all the available evidence. While it takes account of the results from UN inspections and other publicly available information, it also draws heavily on the latest intelligence about Iraqi efforts to develop their programmes and capabilities since 1998. The main conclusions are that:
 - Iraq has a useable chemical and biological weapons capability, in breach of UNSCR 687, which has included recent production of chemical and biological agents;
 - Saddam continues to attach great importance to the possession of weapons of mass destruction and ballistic missiles which he regards as being the basis for Iraq's regional power. He is determined to retain these capabilities;
 - Iraq can deliver chemical and biological agents using an extensive range of artillery shells, free-fall bombs, sprayers and ballistic missiles;
 - Iraq continues to work on developing nuclear weapons, in breach of its obligations under the Non-Proliferation Treaty and in breach of UNSCR 687. Uranium has been sought from Africa that has no civil nuclear application in Iraq;
 - Iraq possesses extended-range versions of the SCUD ballistic missile in breach of UNSCR 687 which are capable of reaching Cyprus, Eastern Turkey, Tehran and Israel. It is also developing longer-range ballistic missiles;
 - Iraq's current military planning specifically envisages the use of chemical and biological weapons;
 - Iraq's military forces are able to use chemical and biological weapons, with command, control and logistical arrangements in place. The Iraqi military are able to deploy these weapons within 45 minutes of a decision to do so;
 - Iraq has learnt lessons from previous UN weapons inspections and is already taking steps to conceal and disperse sensitive equipment and documentation in advance of the return of inspectors;
 - Iraq's chemical, biological, nuclear and ballistic missiles programmes are well-funded.

CHEMICAL AND BIOLOGICAL WEAPONS

Joint Intelligence Committee (JIC) Assessment: 1999–2002

2. Since the withdrawal of the inspectors the JIC has monitored evidence, including from secret intelligence, of continuing work on Iraqi offensive chemical and biological warfare capabilities. In the first half of 2000 the JIC noted

intelligence on Iraqi attempts to procure dual-use chemicals and on the reconstruction of civil chemical production at sites formerly associated with the chemical warfare programme. Iraq had also been trying to procure dual-use materials and equipment which could be used for a biological warfare programme. Personnel known to have been connected to the biological warfare programme up to the Gulf War had been conducting research into pathogens. There was intelligence that Iraq was starting to produce biological warfare agents in mobile production facilities. Planning for the project had begun in 1995 under Dr Ribab Taha, known to have been a central player in the pre-Gulf War programme. The JIC concluded that Iraq had sufficient expertise, equipment and material to produce biological warfare agents within weeks using its legitimate bio-technology facilities.

3. In mid-2001 the JIC assessed that Iraq retained some chemical warfare agents, precursors, production equipment and weapons from before the Gulf War. These stocks would enable Iraq to produce significant quantities of mustard gas within weeks and of nerve agent within months. The JIC concluded that intelligence on Iraqi former chemical and biological warfare facilities, their limited reconstruction and civil production pointed to a continuing research and development programme. These chemical and biological capabilities represented the most immediate threat from Iraqi weapons of mass destruction. Since 1998 Iraqi development of mass destruction weaponry had been helped by the absence of inspectors and the increase in illegal border trade, which was providing hard currency.
4. In the last six months the JIC has confirmed its earlier judgements on Iraqi chemical and biological warfare capabilities and assessed that Iraq has the means to deliver chemical and biological weapons.

Recent intelligence

5. Subsequently, intelligence has become available from reliable sources which complements and adds to previous intelligence and confirms the JIC assessment that Iraq has chemical and biological weapons. The intelligence also shows that the Iraqi leadership has been discussing a number of issues related to these weapons. This intelligence covers:
 - Confirmation that chemical and biological weapons play an important role in Iraqi military thinking; intelligence shows that Saddam attaches great importance to the possession of chemical and biological weapons which he regards as being the basis for Iraqi regional power. He believes that respect for Iraq rests on its possession of these weapons and the missiles capable of delivering them. Intelligence indicates that Saddam is determined to retain this capability and recognises that Iraqi political weight would be diminished if Iraq's military power rested solely on its conventional military forces.
 - Iraqi attempts to retain its existing banned weapons systems; Iraq is already taking steps to prevent UN weapons inspectors finding evidence of

its chemical and biological weapons programme. Intelligence indicates that Saddam has learnt lessons from previous weapons inspections, has identified possible weak points in the inspections process and knows how to exploit them. Sensitive equipment and papers can easily be concealed and in some cases this is already happening. The possession of mobile biological agent production facilities will also aid concealment efforts. Saddam is determined not to lose the capabilities that he has been able to develop further in the four years since inspectors left.

- **Saddam's willingness to use chemical and biological weapons:** intelligence indicates that as part of Iraq's military planning Saddam is willing to use chemical and biological weapons, including against his own Shia population. Intelligence indicates that the Iraqi military are able to deploy chemical or biological weapons within 45 minutes of an order to do so.

Chemical and biological agents: surviving stocks

6. When confronted with questions about the unaccounted stocks, Iraq has claimed repeatedly that if it had retained any chemical agents from before the Gulf War they would have deteriorated sufficiently to render them harmless. But Iraq has admitted to UNSCOM to having the knowledge and capability to add stabiliser to nerve agent and other chemical warfare agents which would prevent such decomposition. In 1997 UNSCOM also examined some munitions which had been filled with mustard gas prior to 1991 and found that they remained very toxic and showed little sign of deterioration.
7. Iraq has claimed that all its biological agents and weapons have been destroyed. No convincing proof of any kind has been produced to support this claim. In particular, Iraq could not explain large discrepancies between the amount of growth media (nutrients required for the specialised growth of agent) it procured before 1991 and the amounts of agent it admits to having manufactured. The discrepancy is enough to produce more than three times the amount of anthrax allegedly manufactured.

Chemical agent: production capabilities

8. Intelligence shows that Iraq has continued to produce chemical agent. During the Gulf War a number of facilities which intelligence reporting indicated were directly or indirectly associated with Iraq's chemical weapons effort were attacked and damaged. Following the ceasefire UNSCOM destroyed or rendered harmless facilities and equipment used in Iraq's chemical weapons programme. Other equipment was released for civilian use either in industry or academic institutes, where it was tagged and regularly inspected and monitored, or else placed under camera monitoring, to ensure that it was not being misused. This monitoring ceased when UNSCOM withdrew from Iraq in 1998. However, capabilities remain and, although the main chemical weapon production facility at al-Muthanna was completely destroyed by UNSCOM and has not been

rebuilt, other plants formerly associated with the chemical warfare programme have been rebuilt. These include the chlorine and phenol plant at Fallujah 2 near Habbaniyah. In addition to their civilian uses, chlorine and phenol are used for precursor chemicals which contribute to the production of chemical agents.

9. Other dual-use facilities, which are capable of being used to support the production of chemical agent and precursors, have been rebuilt and re-equipped. New chemical facilities have been built, some with illegal foreign assistance, and are probably fully operational or ready for production. These include the Ibn Sina Company at Tarmiyah (see figure 1), which is a chemical research centre. It undertakes research, development and production of chemicals previously imported but not now available and which are needed for Iraq's civil industry. The Director General of the research centre is Hikmat Na'im al-Jalu who prior to the Gulf War worked in Iraq's nuclear weapons programme and after the war was responsible for preserving Iraq's chemical expertise.

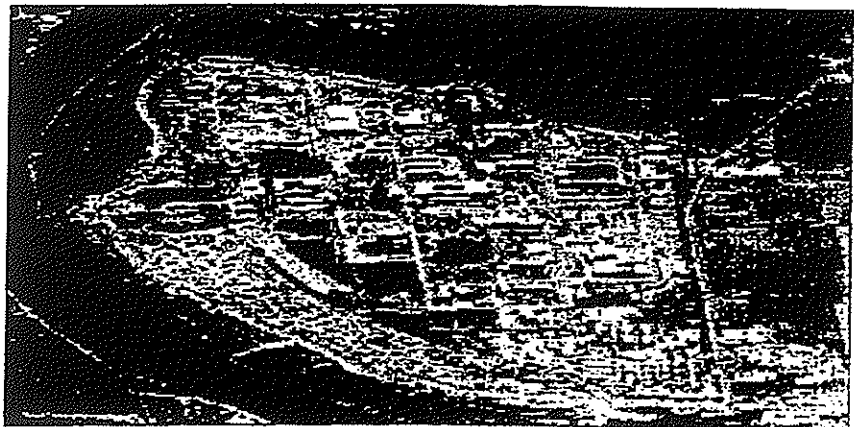


FIGURE 1: THE IBN SINA COMPANY AT TARMIAH

10. Parts of the al-Qa'qa' chemical complex damaged in the Gulf War have also been repaired and are operational. Of particular concern are elements of the phosgene production plant at al-Qa'qa'. These were severely damaged during the Gulf War, and dismantled under UNSCOM supervision, but have since been rebuilt. While phosgene does have industrial uses it can also be used by itself as a chemical agent or as a precursor for nerve agent.
11. Iraq has retained the expertise for chemical warfare research, agent production and weaponisation. Most of the personnel previously involved in the programme remain in country. While UNSCOM found a number of technical manuals (so called "cook books") for the production of chemical agents and critical precursors, Iraq's claim to have unilaterally destroyed the bulk of the documentation cannot be confirmed and is almost certainly untrue. Recent intelligence indicates that Iraq is still discussing methods of concealing such documentation in order to ensure that it is not discovered by any future UN inspections.

The Problem of Dual-Use Facilities

Almost all components and supplies used in weapons of mass destruction and ballistic missile programmes are dual-use. For example, any major petrochemical or biotech industry, as well as public health organisations, will have legitimate need for most materials and equipment required to manufacture chemical and biological weapons. Without UN weapons inspectors it is very difficult therefore to be sure about the true nature of many of Iraq's facilities.

For example, Iraq has built a large new chemical complex, Project Baiji, in the desert in north west Iraq at al-Sharqat (see figure 2). This site is a former uranium enrichment facility which was damaged during the Gulf War and rendered harmless under supervision of the IAEA. Part of the site has been rebuilt, with work starting in 1992, as a chemical production complex. Despite the site being far away from populated areas it is surrounded by a high wall with watch towers and guarded by armed guards. Intelligence reports indicate that it will produce nitric acid which can be used in explosives, missile fuel and in the purification of uranium.



FIGURE 2: AL-SHARQAT CHEMICAL PRODUCTION FACILITY

Biological agent: production capabilities

12. We know from intelligence that Iraq has continued to produce biological warfare agents. As with some chemical equipment, UNSCOM only destroyed equipment that could be directly linked to biological weapons production. Iraq also has its own engineering capability to design and construct biological agent associated fermenters, centrifuges, sprayer dryers and other equipment and is judged to be self-sufficient in the technology required to produce biological weapons. The

experienced personnel who were active in the programme have largely remained in the country. Some dual-use equipment has also been purchased, but without monitoring by UN inspectors Iraq could have diverted it to their biological weapons programme. This newly purchased equipment and other equipment previously subject to monitoring could be used in a resurgent biological warfare programme. Facilities of concern include:

- the Castor Oil Production Plant at Fallujah: this was damaged in UK/US air attacks in 1998 (Operation Desert Fox) but has been rebuilt. The residue from the castor bean pulp can be used in the production of the biological agent ricin;
 - the al-Dawrah Foot and Mouth Disease Vaccine Institute: which was involved in biological agent production and research before the Gulf War;
 - the Amariyah Sera and Vaccine Plant at Abu Ghraib: UNSCOM established that this facility was used to store biological agents, seed stocks and conduct biological warfare associated genetic research prior to the Gulf War. It has now expanded its storage capacity.
13. UNSCOM established that Iraq considered the use of mobile biological agent production facilities. In the past two years evidence from defectors has indicated the existence of such facilities. Recent intelligence confirms that the Iraqi military have developed mobile facilities. These would help Iraq conceal and protect biological agent production from military attack or UN inspection.

Chemical and biological agents: delivery means

14. Iraq has a variety of delivery means available for both chemical and biological agents. These include:
- free-fall bombs: Iraq acknowledged to UNSCOM the deployment to two sites of free-fall bombs filled with biological agent during 1990–91. These bombs were filled with anthrax, botulinum toxin and aflatoxin. Iraq also acknowledged possession of four types of aerial bomb with various chemical agent fills including sulphur mustard, tabun, sarin and cyclosarin;
 - artillery shells and rockets: Iraq made extensive use of artillery munitions filled with chemical agents during the Iran-Iraq War. Mortars can also be used for chemical agent delivery. Iraq is known to have tested the use of shells and rockets filled with biological agents. Over 20,000 artillery munitions remain unaccounted for by UNSCOM;
 - helicopter and aircraft borne sprayers: Iraq carried out studies into aerosol dissemination of biological agent using these platforms prior to 1991. UNSCOM was unable to account for many of these devices. It is probable that Iraq retains a capability for aerosol dispersal of both chemical and biological agent over a large area;
 - al-Hussein ballistic missiles (range 650km): Iraq told UNSCOM that it filled 25 warheads with anthrax, botulinum toxin and aflatoxin. Iraq also

developed chemical agent warheads for al-Hussein. Iraq admitted to producing 50 chemical warheads for al-Hussein which were intended for the delivery of a mixture of sarin and cyclosarin. However, technical analysis of warhead remnants has shown traces of VX degradation product which indicate that some additional warheads were made and filled with VX;

- al-Samoud/Ababil-100 ballistic missiles (range 150km plus): it is unclear if chemical and biological warheads have been developed for these systems, but given the Iraqi experience on other missile systems, we judge that Iraq has the technical expertise for doing so;

- L-29 remotely piloted vehicle programme (see figure 3): we know from intelligence that Iraq has attempted to modify the L-29 jet trainer to allow it to be used as an Unmanned Aerial Vehicle (UAV) which is potentially capable of delivering chemical and biological agents over a large area.



FIGURE 3: THE L-29 JET TRAINER

Chemical and biological warfare: command and control

15. The authority to use chemical and biological weapons ultimately resides with Saddam but intelligence indicates that he may have also delegated this authority to his son Qusai. Special Security Organisation (SSO) and Special Republican Guard (SRG) units would be involved in the movement of any chemical and biological weapons to military units. The Iraqi military holds artillery and missile systems at Corps level throughout the Armed Forces and conducts regular training with them. The Directorate of Rocket Forces has operational control of strategic missile systems and some Multiple Launcher Rocket Systems.

Chemical and biological weapons: summary

16. Intelligence shows that Iraq has covert chemical and biological weapons programmes, in breach of UN Security Council Resolution 687 and has continued to produce chemical and biological agents. Iraq has:
 - chemical and biological agents and weapons available, both from pre-Gulf War stocks and more recent production;
 - the capability to produce the chemical agents mustard gas, tabun, sarin, cyclosarin, and VX capable of producing mass casualties;

- a biological agent production capability and can produce at least anthrax, botulinum toxin, aflatoxin and ricin. Iraq has also developed mobile facilities to produce biological agents;
- a variety of delivery means available;
- military forces, which maintain the capability to use these weapons with command, control and logistical arrangements in place.

NUCLEAR WEAPONS

Joint Intelligence Committee (JIC) Assessments: 1999–2001

17. Since 1999 the JIC has monitored Iraq's attempts to reconstitute its nuclear weapons programme. In mid-2001 the JIC assessed that Iraq had continued its nuclear research after 1998. The JIC drew attention to intelligence that Iraq had recalled its nuclear scientists to the programme in 1998. Since 1998 Iraq had been trying to procure items that could be for use in the construction of centrifuges for the enrichment of uranium.

Iraqi nuclear weapons expertise

18. Paragraphs 5 and 6 of Chapter 2 describe the Iraqi nuclear weapons programme prior to the Gulf War. It is clear from IAEA inspections and Iraq's own declarations that by 1991 considerable progress had been made in both developing methods to produce fissile material and in weapons design. The IAEA dismantled the physical infrastructure of the Iraqi nuclear weapons

Elements of a nuclear weapons programme: nuclear fission weapon

A typical nuclear fission weapon consists of:

- fissile material for the core which gives out huge amounts of explosive energy from nuclear reactions when made "super critical" through extreme compression. Fissile material is usually either highly enriched uranium (HEU) or weapons-grade plutonium:
 - HEU can be made in gas centrifuges (see separate box on p25);
 - plutonium is made by reprocessing fuel from a nuclear reactor;
- explosives which are needed to compress the nuclear core. These explosives also require a complex arrangement of detonators, explosive charges to produce an even and rapid compression of the core;
- sophisticated electronics to fire the explosives;
- a neutron initiator to provide initial burst of neutrons to start the nuclear reactions.

Weaponisation

Weaponisation is the conversion of these concepts into a reliable weapon. It includes:

- developing a weapon design through sophisticated science and complex calculations;
- engineering design to integrate with the delivery system;
- specialised equipment to cast and machine safely the nuclear core;
- dedicated facilities to assemble the warheads;
- facilities to rigorously test all individual components and designs;

The complexity is much greater for a weapon that can fit into a missile warhead than for a larger Nagasaki-type bomb.

programme, including the dedicated facilities and equipment for uranium separation and enrichment, and for weapon development and production, and removed the remaining highly enriched uranium. But Iraq retained, and retains, many of its experienced nuclear scientists and technicians who are specialised in the production of fissile material and weapons design. Intelligence indicates that Iraq also retains the accompanying programme documentation and data.

19. Intelligence shows that the present Iraqi programme is almost certainly seeking an indigenous ability to enrich uranium to the level needed for a nuclear weapon. It indicates that the approach is based on gas centrifuge uranium enrichment, one of the routes Iraq was following for producing fissile material before the Gulf War. But Iraq needs certain key equipment, including gas centrifuge components and components for the production of fissile material before a nuclear bomb could be developed.

Gas centrifuge uranium enrichment

Uranium in the form of uranium hexafluoride is separated into its different isotopes in rapidly spinning rotor tubes of special centrifuges. Many hundreds or thousands of centrifuges are connected in cascades to enrich uranium. If the lighter U235 isotope is enriched to more than 90% it can be used in the core of a nuclear weapon.

20. Following the departure of weapons inspectors in 1998 there has been an accumulation of intelligence indicating that Iraq is making concerted covert efforts to acquire dual-use technology and materials with nuclear applications. Iraq's known holdings of processed uranium are under IAEA supervision. But there is intelligence that Iraq has sought the supply of significant quantities of uranium from Africa. Iraq has no active civil nuclear power programme or nuclear power plants and therefore has no legitimate reason to acquire uranium.

Iraq's civil nuclear programme

- Iraq's long-standing civil nuclear power programme is limited to small scale research. Activities that could be used for military purposes are prohibited by UNSCR 687 and 715.
- Iraq has no nuclear power plants and therefore no requirement for uranium as fuel.
- Iraq has a number of nuclear research programmes in the fields of agriculture, biology, chemistry, materials and pharmaceuticals. None of these activities requires more than tiny amounts of uranium which Iraq could supply from its own resources.
- Iraq's research reactors are non-operational; two were bombed and one was never completed.

21. Intelligence shows that other important procurement activity since 1998 has included attempts to purchase:
 - vacuum pumps which could be used to create and maintain pressures in a gas centrifuge cascade needed to enrich uranium;
 - an entire magnet production line of the correct specification for use in the motors and top bearings of gas centrifuges. It appears that Iraq is attempting to acquire a capability to produce them on its own rather than rely on foreign procurement;
 - Anhydrous Hydrogen Fluoride (AHF) and fluorine gas. AHF is commonly used in the petrochemical industry and Iraq frequently imports significant amounts, but it is also used in the process of converting uranium into uranium hexafluoride for use in gas centrifuge cascades;
 - one large filament winding machine which could be used to manufacture carbon fibre gas centrifuge rotors;
 - a large balancing machine which could be used in initial centrifuge balancing work.
22. Iraq has also made repeated attempts covertly to acquire a very large quantity (60,000 or more) of specialised aluminium tubes. The specialised aluminium in question is subject to international export controls because of its potential application in the construction of gas centrifuges used to enrich uranium, although there is no definitive intelligence that it is destined for a nuclear programme.

Nuclear weapons: timelines

23. In early 2002, the JIC assessed that UN sanctions on Iraq were hindering the import of crucial goods for the production of fissile material. The JIC judged

that while sanctions remain effective Iraq would not be able to produce a nuclear weapon. If they were removed or prove ineffective, it would take Iraq at least five years to produce sufficient fissile material for a weapon indigenously. However, we know that Iraq retains expertise and design data relating to nuclear weapons. We therefore judge that if Iraq obtained fissile material and other essential components from foreign sources the timeline for production of a nuclear weapon would be shortened and Iraq could produce a nuclear weapon in between one and two years.

BALLISTIC MISSILES

Joint Intelligence Committee (JIC) Assessment: 1999–2002

24. In mid-2001 the JIC drew attention to what it described as a “step-change” in progress on the Iraqi missile programme over the previous two years. It was clear from intelligence that the range of Iraqi missiles which was permitted by the UN and supposedly limited to 150kms was being extended and that work was under way on larger engines for longer-range missiles.
25. In early 2002 the JIC concluded that Iraq had begun to develop missiles with a range of over 1,000kms. The JIC assessed that if sanctions remained effective the Iraqis would not be able to produce such a missile before 2007. Sanctions and the earlier work of the inspectors had caused significant problems for Iraqi missile development. In the previous six months Iraqi foreign procurement efforts for the missile programme had been bolder. The JIC also assessed that Iraq retained up to 20 al-Hussein missiles from before the Gulf War.

The Iraqi ballistic missile programme since 1998

26. Since the Gulf War, Iraq has been openly developing two short-range missiles up to a range of 150km, which are permitted under UN Security Council Resolution 687. The al-Samoud liquid propellant missile has been extensively tested and is being deployed to military units. Intelligence indicates that at least 50 have

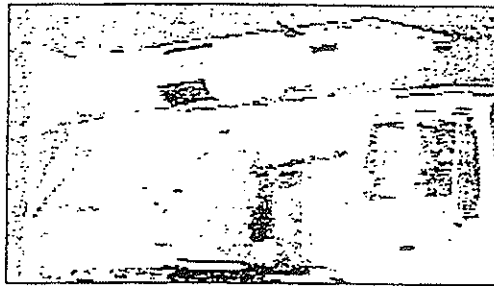


FIGURE 4: ABABIL-100

been produced. Intelligence also indicates that Iraq has worked on extending its range to at least 200km in breach of UN Security Resolution 687. Production of the solid propellant Ababil-100 (Figure 4) is also underway, probably as an unguided rocket at this stage. There are also plans to extend its range to at least 200km. Compared to liquid propellant missiles, those powered by solid

propellant offer greater ease of storage, handling and mobility. They are also quicker to take into and out of action and can stay at a high state of readiness for longer periods.

27. According to intelligence, Iraq has retained up to 20 al-Hussein missiles (Figure 5), in breach of UN Security Council Resolution 687. These missiles were either hidden from the UN as complete systems, or re-assembled using illegally retained engines and other components. We judge that the engineering expertise available would allow these missiles to be maintained effectively, although the fact that at least some require re-assembly makes it difficult to judge exactly how many could be available for use. They could be used with conventional, chemical or biological warheads and, with a range of up to 650km, are capable of reaching a number of countries in the region including Cyprus, Turkey, Saudi Arabia, Iran and Israel.

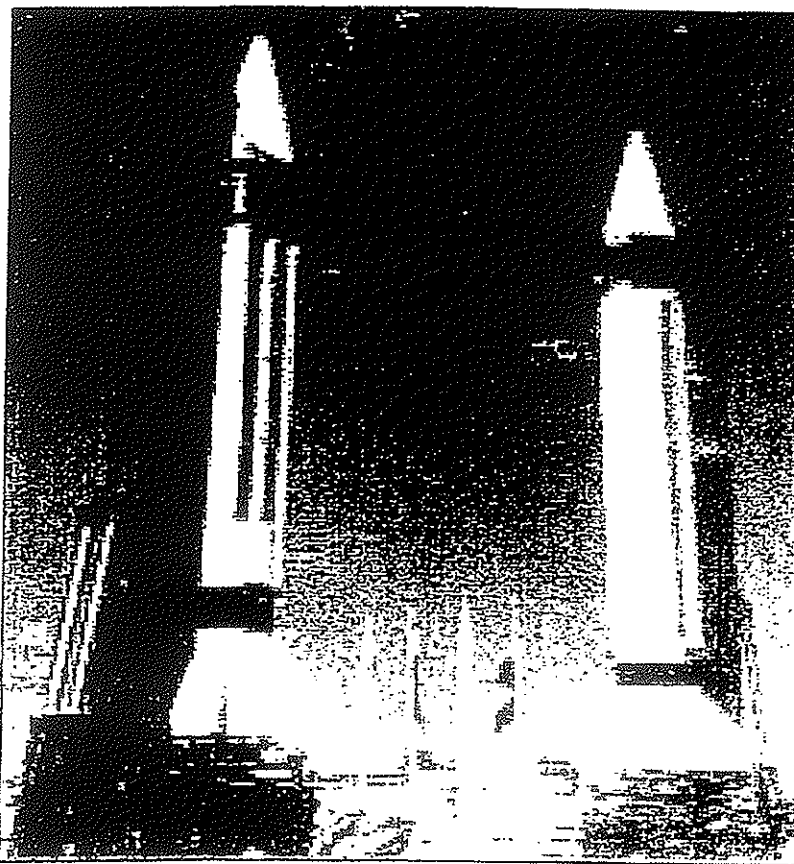


FIGURE 5: AL-HUSSEIN