

The Poison Gas Connection

*Western suppliers of unconventional weapons
and technologies to Iraq and Libya*

A Special Report
Commissioned by the
Simon Wiesenthal Center

Prepared by
Kenneth R. Timmerman

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Simon Wiesenthal Center
Los Angeles, California
Tel: (213) 553-9036
Fax: (213) 553-8007

Middle East Defense News
Paris, France
Tel: (331) 39 62 68 30

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and technologies to the Middle East*

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9760 West Pico Blvd.
Los Angeles, CA 90035-4792
(213) 553-9036
Facs (213) 553-8007

Dear Friend,

Not since the 1930's has one man riveted the world's attention as has Saddam Hussein.

His naked aggression and willingness to push mankind to the very brink is the most serious threat facing the civilized world since the end of the Second World War.

But Saddam Hussein's Iraq did not become what one Western intelligence official described as "the most experienced government in the world in the production and use of chemical weapons" by some freak accident. Who supplied this madman with the technology? Who handed him his poisonous gases and potent chemicals? Staffed his research facilities and built his plants?

This report gives the startling answers to these questions. It reveals how 50 years after the Holocaust, German technology is again in the forefront of helping dictators achieve their destructive aims. How German firms, as well as companies from France and elsewhere claimed ignorance and denied culpability. "We are only supplying them with chemicals for pesticides", was the incredible claim of one company official. This report tells how governments chose to look the other way for geopolitical considerations and in the name of greed -- doing business with Saddam Hussein right up to the invasion of Kuwait.

To be indifferent to the facts is to admit that we have learned nothing from the experience of Auschwitz. It is simply not enough to draw a line in the desert. We must have the courage and commitment to draw a line in the corporate boardrooms and in the pocketbooks of wealthy corporations.

It is time to remember that in 1946 a British court in Hamburg refused to believe the civilian principals of a German chemical company that they were ignorant of the use of Zyklon B against innocent civilians. Two of the principals of that firm were hanged for aiding and abetting in crimes against humanity. The Simon Wiesenthal Center believes that international legal scholars should look seriously at this relative precedent.

The investigative trail has already led to 86 German firms. Surely Berlin must lead the way in closing off the wholesale transfer of the technology of death. For it would be an unforgivable stain on the unified Germany to once again find German labels at the sites of another despot's mass murders.

But Germany does not stand indicted alone. Firms from 21 countries are listed in this report (see page 46). If you feel as strongly as we do after reading this report, we urge you to write the leaders of your country and the civilized world to demand action.

Rabbi Marvin Hier
Dean

Kenneth R. Timmerman

Investigative journalist Kenneth R. Timmerman is well known in Europe and the U.S. for his work on the Middle East and on black market arms networks. He has written for numerous publications, including Newsweek, the Wall Street Journal, the International Herald Tribune, l'Express, the American Spectator, and has made numerous television appearances (ABC, CBS, CNN, BBC television, etc.). He has travelled extensively throughout the Middle East, and publishes a newsletter on Middle East Security issues, Mednews.

A first book of non-fiction, *Fanning the Flames: an expose of Greed, Guns, and Geopolitics in the Gulf War*, was serialized by the New York Times Syndication Service in 1987-88 before publication in Switzerland under the title *Ol ins Feuer* in 1988. A second book, devoted to high-tech espionage, was published in France last year by les Editions Plon, under the title *La Grande Fauche (Gorbachev's Technology Wars)*.

Mr. Timmerman is 36, and lives outside Paris with his Swedish wife and four children.

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Executive Summary

The proliferation of weapons of mass destruction in the Middle East poses the greatest threat to world peace since the end of World War II.

Four distinct types of weapons are involved: chemical, biological, and nuclear weapons, and long-range delivery vectors such as ballistic missiles or Iraq's "super-gun."

Four Middle Eastern nations have spent large sums of money to acquire these weapons and technologies: Iraq, Libya, Syria, and Iran. Except for Iran, all are still in a state of war with Israel. While none of these four is yet believed to have acquired nuclear weapons, Iraq, Syria and Libya have extensive arsenals of chemical weapons, and at least two - Iraq and Libya - have used them in combat.

In a speech broadcast by Iraqi television on April 2, 1990, Iraqi President Saddam Hussein threatened to "burn half of Israel" in the event of an Israeli attack on Iraq. Later, Iraq's Ambassador to the United Nations, Abdul-Amir al Anbari, extended the definition of an Israeli attack to include an attack by U.S. warplanes, since their pilots were really Jews in disguise "who have been issued American passports and whose planes have received American markings." (BBC World Service, August 8, 1990). By Iraqi accounts these threats, if carried out, would involve a massive launch of Iraqi-made ballistic missiles loaded with poison gas against Israel's densely-populated coastal plain. The death toll from such an attack could reach into the hundreds of thousands.

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This background document focuses on Iraq and Libya, since their CW programs are beyond a doubt the most extensive. It examines the web of international companies, the vast majority of them German, which have supplied Iraq and Libya with weapons of mass destruction and the means to manufacture them, and gives a detailed run-down of CW production facilities now in operation in those two countries.

Two key documents are presented in the appendix.

The first is a data base printout, based on open source material, listing more than two hundred companies in Western Europe and the U.S. that have actively supplied Iraq with critical elements for its strategic weapons programs. If the list were extended to cover conventional arms deliveries (aircraft, helicopters, missiles, munitions, etc), it would stretch into the thousands.

The second is a report presented to the German Bundestag by the West German government on February 15, 1989, which details the involvement of West Germany companies in Libyan chemical weapons programs. This report, which is a public document, shows in illuminating detail that the West German government was aware of poison gas deliveries by German companies to Libya beginning in April 1980, but did nothing to stop them.

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I. Iraq

Introduction

Over the past ten years, Iraq has imported more than \$50 billion in modern weaponry, and this is a conservative estimate¹ While the bulk of Iraqi army purchases (tanks, armored vehicles and artillery) came from the USSR, much of Iraq's best weaponry was bought from the West. From Italy, Iraq purchased modern frigates and missile boats worth more than \$3 billion. From Britain and Holland, Iraq purchased frequency-hopping radios and other electronics gear. From France, Iraq purchased more than \$15 billion worth of sophisticated weaponry, including 133 Mirage F1 fighter-bombers, 140 armed helicopters, 1,000 armored vehicles, 884 Exocet missiles, 20,000 HOT and Milan anti-tank missiles, and 2,500 air combat missiles.²

Even when the credit crunch began to take its toll in 1987-88, Western arms makers were making fabulous profits on Iraq. Iraqi arms purchasers were welcomed as VIP guests in most Western capitals. As Christopher Cowley, an engineer now under indictment in Britain for his role in the supergun affair, told a recent BBC *Panorama* broadcast, "This was a very, very large cake that had to be cut up. We were talking about not millions or hundreds of millions, we were talking about billions of pounds. And every European Government wanted their share of that cake."³

There was nothing illicit about the Iraqi arms purchases. This entire conventional weapons arsenal was purchased above the board.

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Iraq had no need to resort to clandestine or grey market purchases, as did Iran throughout the Gulf War. The West was courting Iraq as the bulwark against Islamic expansionism spreading Western from Tehran, and the Iraqis took advantage of this privileged position to make friends and to make deals.

They also took advantage of all the boon years to learn the ins and outs of the Western arms industry. Western salesman acknowledge openly that by the mid-1980s, the Iraqis had accumulated an awesome experience of the arms marketplace. They knew what was available, and at what price. And they knew what they wanted. Saddam Hussein is said to have commented once that he was willing to pay the French 10% more than their other clients did, just to make sure they gave him the best.

For twenty years, this strategy paid off. At the height of the war with Iran, France delivered state-of-the-art missiles and electronic counter-measures (ECM) to Iraq, often before they went into service with the French Armed Services.⁴ And Iraq's other Western suppliers did the same.

But Iraq was not content to build up the largest arsenal of conventional weapons the Arab world had ever seen. Saddam Hussein sought other weapons - weapons of mass destruction - that he felt would give him the edge over Israel. And he used the years of influence, of arms buying and oil selling, to lay the groundwork for a vast clandestine network to procure the technologies he needed to make those weapons in Iraq, often with the connivance, if not the complicity, of Western governments.

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The controls: Numerous international conventions exist to control the flow of strategic weapons technology and their use in war. The barbarous use of chemical weapons during WWI led directly to the 1925 Geneva Protocol banning the wartime use of chemical or bacteriological agents. This was followed by the 1972 Biological Weapons Convention, which outlaws the production and use of toxins.

Starting in 1984, concern over Iraq's use of poison gas in the Gulf war led several Western countries to enact laws establishing "watch lists" of precursor chemicals, and to impose some form of export controls on their purchase. But Iraq simply sidestepped the countries with more or less effective export controls (such as the U.S.) for its CW purchases, and concentrated its efforts on others (such as West Germany) where the controls either did not exist or were not enforced.

Iraq's widespread use of poison gas, first against Iran, and later against its own Kurdish population, showed that haphazard export controls and declarations of intent were not enough. Concern with Iraq's use of poison gas, and with Libya's poison gas manufacturing plant at Rabta, led directly to the convening of the January 1989 Paris Conference on Chemical Weapons. But heavy lobbying by Iraq and its Third World allies prevented the Conference from reaching agreement to ban the production and stockpiling of chemical weapons. Meanwhile, Iraq has built up its own domestic chemicals industry, making international controls of the type the Paris Conference *might* have passed ineffective before ink could ever dry on the paper.

Even fewer controls existed on ballistic missile technologies until the United States and six Western allies (Canada, France, Great Britain, Italy, Japan, and West Germany) signed the Missile Technology Control

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Regime (MTCR) on April 16, 1987. Most experts agree that the MTCR was enacted too late. As former Pentagon arms control expert, Frank Gaffney put it, MTCR was like "closing the door to the barn after the horse has run out."⁵ By the time Western nations signed the Treaty, Iraq had established long-standing relationships with reliable suppliers of ballistic missile technology, and had mastered the art of clandestine procurement.

So successful were the Iraqis at beating the controls that they even succeeded in getting Western banks (such as the Atlanta branch of the Banca Nazionale del Lavoro) to finance poison gas, ballistic missile, and nuclear technology purchases. And one month after Iraq's invasion of Kuwait, Iraq's principle clandestine purchasing company, the Trade & Development Group, continued to make deals and arrange shipments to Iraq from its headquarters in London.⁶

It is indeed likely that many of Iraq's clandestine suppliers are continuing their shipments today, using the black market methods they have by now perfected to run the gauntlet of the UN embargo.

A. Chemical Weapons production today

Iraq's chemical weapons (CW) production capability - and its stockpile of CW agents - is so extensive it dwarfs that of all other Middle Eastern nations combined. Iraq may well be the principle manufacturer of chemical weapons in the world today. Its stockpiles of CW and of CW agents rank only third after those of the USSR and the United States, the only other nations in the world to have declared CW stockpiles.

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A recent French intelligence estimate, quoted by the newsweekly *l'Express*, identifies three major CW production sites in Iraq, located near the towns of Samarra, Fallujah, and Akashat. Major CW stockpiles are currently maintained north of Fao, at a military laboratory at Balad air base to the north of Baghdad, and in underground stores near the holy city of Kerbala. The production plants, which were designed, built, and equipped by Western companies - most of them German - are now producing from between 1,400 to 2,500 tons of CW agents every year, including mustard gas, cyanide, somar, sarin and tabun.⁷

But even this troubling estimate may fall way short of the mark. *Der Spiegel* reported recently⁸ that a German firm, W.E.T.GmbH, built production lines for Tabun and Sarin nerve gas in Fallujah (identified in contractual documents as Project 33/85) capable of manufacturing 17.6 tons of nerve gas *per day*. For 300 effective production days, this plant alone was therefore capable of putting out 5,280 tons of nerve gas per year - more than twice the maximum estimate advanced by the French for Iraq's entire yearly production of CW agents!

U.S. intelligence officials unequivocally identify Iraq as "the most experienced country in the world" when it comes to the production and use of chemical weapons. Speaking in interviews during the Paris Chemical Weapons conference in January 1989, the officials noted that the Iraqis had "solved the production problem, [and] know how to fill munitions. So they come out of [the Gulf] war more experienced than the U.S. and the Soviet Union" in all aspects of chemical warfare. These sources said the United States had identified seven fully-dedicated CW production facilities in Iraq.⁹

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Iraqi weapons plants are now capable of filling a wide variety of munitions with chemical warfare agents, using specially-designed machine tools purchased on the European market. During its war with Iran, Iraq provided ample evidence that it can deliver CW from combat aircraft and by various means on the ground. Known delivery vehicles include Tu-16 and Tu-22 long-range heavy bombers; Su 22 and Mirage F1 EQ5 strike aircraft; MiG 29 fighters; air-to-ground rockets; gravity bombs; air-dropped dispenser tanks; truck or helicopter-mounted dispenser tanks; 122 mm, 152 and 155 mm field howitzers; and long-range multiple-rocket launch systems (the 50/100 km range Ababil system, jointly developed by Iraq and Yugoslavia).

While there is not yet any firm evidence that Iraq has managed to develop chemical warheads for its medium-range ballistic missiles, there can be no doubt that this is one of Iraq's top priorities. The French intelligence evaluation quoted above estimates that a single Iraqi SCUD-B tipped with a CW warhead using a volatile agent would contaminate an area of 100 hectares upon explosion. Use of a persistent agent would increase lethality to 150-250 hectares.

Iraq has also begun developing biological weapons at Salman Pak, a dedicated bacteriological research facility along the Tigris River 17 km south of Baghdad. NBC News reported on April 11, 1990 that Iraq had developed strains of anthrax, typhoid and cholera capable of being packed into biological munitions, and identified one U.S. concern, the Atlanta Centers for Disease Control, as having sent three shipments of West Nile Fever virus to Salman Pak in 1985.¹⁰ German press reports allege that a small German firm from Neustadt am Rügenberge, Josef

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Kühn, has delivered small quantities (100 milligrams each) of the deadly Mycotoxins TH-2 and T-2.¹¹

B. The Akashat plant

Iraq first sought to acquire CW agents and technologies abroad in the mid-1970s. Initial attempts were made to purchase precursor chemicals in the United States, but these were blocked by tough on-site inspection requirements by the Carter Administration and by safety considerations brought up by the companies themselves.¹² "At that time," noted Washington Post journalist David Ignatius, "Iraq's main enemy wasn't Iran, but Israel. And it may be Israel, in the long, run that has the most to fear from Iraq's chemical-weapons arsenal."

Iraq intensified its world-wide search for chemical weapons in 1981, when a raid by Israeli Air Force F-16s smashed Iraq's French-built nuclear reactor, and with it, Saddam Hussein's dream of making Iraq the first Arab nation to possess the Islamic Bomb - at least, temporarily. Iraqi agents scoured the world for the materials needed to produce rudimentary chemical weapons such as mustard gas (yperite). This blistering agent, British researcher Julian Perry-Robinson has commented, "is about the easiest CW agent to make once you've got hold of a few common ingredients."¹³

Iraq's first mustard gas plant was completed and in operation by 1983, and appears to have been built with the help of Italian chemical giant Montedison, which was also involved in shipments of CW precursors to Iraq from KBS and Melchimie in Holland, and Atochem in France.¹⁴ Engineering expertise was provided Technipetrol, an Italian

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subsidiary of the French oil company Technip, itself part of the Elf-Erap group.¹⁵ This plant is located in the Western desert at Akashat, near the border with Saudi Arabia, some 16 km from town of Rutbah and 370 km West of Baghdad. It is now believed capable of nerve gas production as well.

But there were problems with this procurement scheme. Shipments of phosphorous oxychloride (a Tabun nerve gas precursor) organized by Montedison were blocked in Italy and in Holland, suppliers became skittish and called back deliveries. Iraq was soon forced to turn its sights elsewhere.

It turned principally to the Federal Republic of Germany.

C. Iraq's 'Special Relationship' with West Germany

Iraq's relationship with Germany goes back a long way. As an ally of the Ottoman Empire during WWI, Germany helped build Iraq's first railroad lines, linking Turkey and Mosul in the north to the Gulf port of Basra in the south. Germany lost its privileged position in Iraq following the Treaty of Versailles, when Iraq became a British protectorate. But in the late 1960s and 1970s, Iraq's Baathist regime sent scores of scientists and technicians to West German universities to learn the best of German science. Their principle interests were mechanical engineering, and chemistry.

One of these students went on to become the head of Iraq's strategic weapons programs. He is a German-trained chemist named Dr. Amer Hammoudi al Saadi. Today, Lt. General al Saadi serves as First Deputy Minister of Industry and Military Industrialization, in charge of that

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Ministry's Military Production Authority (MPA). He is the father of Iraq's chemical weapons programs and of its ballistic missiles. He is also the mastermind behind Iraq's clandestine procurement programs in the West.

In a May 1989 interview, Amer al Saadi explained that Iraq had been seeking from the very start to acquire manufacturing technology for its strategic weapons programs, to soften the bite of an eventual embargo. "When we wanted things that we could not obtain from the outside for one reason or another, we made them ourselves. I am personally grateful to many of the "No's" we received from our arms suppliers. This made us insist, and concentrate our efforts" on the procurement of manufacturing technologies. These efforts, Saadi said, had been so vast and so successful that Iraq now has "export capacity" in certain chemicals, including military black powder.¹⁶

A fluent German speaker, married to a German wife, Dr. al Saadi naturally turned to West Germany in the early 1980s when Iraq needed to make discreet, large-scale purchases of chemicals weapons precursors and the technology to manufacture them in Iraq. In doing so, he was able to draw on his extensive knowledge of that country, its language, and culture.

He was also motivated by a keen appreciation of West German export control laws, which until very recently were the most lax in the entire Western world.

One early attempt by a West German chemical manufacturer to export CW precursors to Iraq was blocked in 1981, after a tense exchange between the incoming Reagan Administration and the government of then-Chancellor Helmut Schmidt. It involved a company whose very

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name evokes the darkest days of German history: pharmaceutical giant, I.G. Farben. "These are the same guys who brought us Zyklon B," one former U.S. official who was involved in blocking the sale pointed out¹⁷. Zyklon B was the gas patented by I.G. Farben and used in Nazi death camps for the extermination of the Jews. Farben also invented Tabun nerve gas in 1937.

On August 22, 1990, German Economics Minister Helmut Haussmann revealed that no fewer than 59 German companies were then under investigation for illicit arms and technology exports to the Middle East, "25 of them specifically involving chemical weapons."¹⁸ Press accounts of West German firms selling strategic technologies to Iraq show that this list is even longer (see Appendix). Over the past year German businessmen have been arrested in several cities for their ties to Iraq, companies have been raided, documents seized. The picture beginning to emerge is of a vast Iraqi pillage of the treasures of West German technology, aided and abetted by the West German authorities in their lust to increase the nation's export earnings.

Der Spiegel has reported extensively on the intimate relationship between the export licensing authority at Eschborn (*Bundesamt für Wirtschaft*, or BfW) and companies involved in illicit technology sales to the Middle East. In its 24 June 1989 issue (24/89), Der Spiegel accused a BfW inspector of working as a paid consultant for a German exporter, Industriewerke Karlsruhe Augsburg (IWKA), to help evade export legislation in order to sell fifteen advanced machine-tools to the Iraqi Military Production Authority in Baghdad. The machine-tools were used to make 155 mm chemical shells for Iraqi field guns.

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As a general rule, Spiegel asserts, Eschborn licensing officials saw their role as "helping industry, not hindering it." Dubious exports of this kind approved by Eschborn in recent years have included more than three thousand sophisticated machine-tools sold since 1986 to the Soviet military industries in violation of COCOM rules¹⁹, in-flight refueling probes sold to the Libyan Air Force in contravention of German law²⁰, nuclear reprocessing technology sold to Pakistan in violation of the Non-Proliferation Treaty²¹, chemical weapons delivered to Iraq and Libya, and gas ultracentrifuges capable of enriching uranium for Iraq's nuclear weapons program.²²

This centrifuge case, which focuses on the H + H Metalform Company of Drensteinfurt, is incredibly the only investigation currently being pursued by the West German authorities involving nuclear technologies. But published accounts show that several other companies were involved, including the West German nuclear consortium Nukem, and half a dozen speciality steel companies..²³

D. Karl Kolb, or the 'Secrets of Samarra'

Iraq's main CW production complex is located on a 25 square kilometer plot in the desert 120 km north of Baghdad, near the holy city of Samarra. The plant is managed under the auspices of the State Establishment for the Production of Pesticides, or SEPP, and is run by a certain Dr. Al Ani. A BBC "Panorama" documentary broadcast on October 27, 1986 revealed extensive details of the complex, including a SPOT satellite photograph. A separate CW manufacturing plant was

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reportedly completed in 1988 at a new site just to the north of Samarra.²⁴

The 'Secrets of Samarra,' as the BBC called their documentary, were the type of secrets everyone knows but does nothing about. For the Samarra "pesticides" plant, which was built by a consortium of West German companies led by Karl Kolb GmbH, had been an open secret since February 1984. And nobody had been able - or willing - to stop it from producing chemical weapons, despite clear and repeated warnings.

The supply of precursor chemicals is often difficult to trace. Scores of different chemicals are involved, and until recently many were not controlled in any way. As Julian Perry-Robinson put it, "There are so many brokers, so many intermediaries, that it takes a skilled investigator to track these things down. A single train-load of chemicals can change hands six times on its way from the factory to the port, so all trace of its origin gets lost."²⁵

But once Iraq began using its newly-perfected CW arsenal in large scale attacks against Iranian troops in February 1984, the wraps were off. Tongues were loosed, documents began to get passed around. Within weeks, one supplier of CW technology and chemicals to Iraq had been publicly identified. It was Karl Kolb GmbH, of Drieich, West Germany. The CIA eventually leaked a classified report on the Samarra plant to the New York Times. The Times presented it by saying there was "overwhelming" evidence that Iraq had embarked on a major nerve gas (Tabun) production plant in Samarra.²⁶

The CIA report detailed deliveries to Iraq by Karl Kolb and by a subsidiary company called Pilot Plant, which had been set up especially to handle the Iraqi deal. Among the equipment they delivered were the

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glass-lined reactor vessels needed for mixing such lethal compounds as Sarin and Tabun nerve gas. Other equipment was subcontracted out to a West German company called Quast, located at Inden-Pier, near Duren by the Dutch border.

After repeated American protests, Chancellor Helmut Kohl is said to have intervened to stop the supplies in August 1984²⁷. But Karl Kolb eventually sued the government, and won. In October 1984, two Karl Kolb engineers returned to Iraq to inspect two brand new poison gas production lines called "Ahmed 1" and "Ahmed 2."²⁸ In other words, despite the posturing of the Kohl government, the gas business went on as usual. In fact, Karl Kolb kept supplying Iraq for at least another four years, with little or no intervention from the West German government.²⁹

"During those years," according to one West German Parliamentarian, "the Americans sent over one thousand "non-papers" to the German government" on the Iraqi poison gas programs, and the involvement of German companies. "They were simply filed away and ignored."³⁰

In the meantime, another West German company, Water Engineering Trading (W.E.T.), was identified in press reports of having signed a 20 million DM contract with Iraq in 1985, to build production lines at a SEPP complex in Fallujah, one for tabun and another for sarin. The contract, known as "Project 33/85," included delivery of 17.6 tons of phosphorus trichloride, a known nerve gas precursor. A follow-on deal was signed by W.E.T. in June 1987. One hundred West German technicians and workers were sent to Iraq to supervise construction and installation³¹

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The al Fallujah poison gas plant is located to the West of Baghdad near the Habbaniyah air base, and it is a crucial facility as far as Iraq's independence from any international embargo is concerned. This is where Iraqi chemists are now making the poison gas precursor chemicals they previously had to import from Europe and the United States. Not only does this huge industrial complex include a vast chemicals plant, but al-Fallujah is where the MPA manufactures most of its ballistic missile fuselages³². Dozens of European and American companies have contributed to it in one way or another, including MBB, Ifat, the Consen Group, Feneberg, and W.E.T.

W.E.T. was in fact little more than a shell company, to cover the private deals with Iraq of two employees of a major West German chemical producer, Preussag AG. Because they had no in-house employees to speak of, W.E.T. had to "purchase" its expertise elsewhere. So it turned to a French chemicals manufacturer, Atochem (a wholly-owned subsidiary of the French national oil company, Elf-Aquitaine), to learn how to handle the extremely dangerous substances it was supposed to deliver to Iraq.³³

W.E.T. also built a small research laboratory at Samarra, where the lethality of the "pesticides" it manufactured in Iraq could be tested on living subjects. In this case, the subjects were dogs and cats, but their resistance to the various "pesticides" made at Samarra was measured in seconds, not minutes or hours. As one of the German engineers who helped build this particular laboratory remarked later, it was indeed "strange" that such tests on live animals would be required for a plant making only pesticides or pharmaceuticals.³⁴

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Iraq's leaders had a curious notion of human life. Iraqi generals frequently referred to Iran's human wave attackers as so many "insects,." As one broadcast from Baghdad Voice of the Masses radio put it, Iraq had prepared "a certain insecticide for every kind of insect."³⁵

E. The German government report.

The real "secret" of Samarra was how it remained a secret for so long. Despite the early press coverage of German involvement in building the plant, little or nothing was done to stop it in Bonn. The Kohl government admitted as much when it presented its only public report to Parliament on the Samarra plant. That report was dated December 20, 1988.³⁶ In other words - more than four years after the first accounts appeared in the press about poison gas deliveries to Iraq, and five years after the first backdoor warnings from the U.S. government about the involvement of German companies.

In its 1988 report, the German government states that its investigation into illicit chemical weapons sales to Iraq only began in November 1987. On November 25, 1987, the German police carried out searches on 29 individuals and/or companies, the report states, believed to be engaged in chemical weapons sales to Iraq. Seized documents were turned over to German Customs. The report named the following German companies as the principle offenders:

- W.E.T. (Walter Engeneering Trading) GmbH of Hamburg;
- Karl Kolb GmbH & Co KG, of Creieich bei Offenbach;
- Pilot Plant GmbH, of Dreieich;
- Prussag AG, of Hannover; and

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- Heberger Bau GmbH, Schifferstadt bei Ludwigshafen.

By December 1988, a total of 38 persons had been indicted, and more than 50 searches had been carried out. But the West German government "still lacks complete proof" that anything illegal had occurred, the report concluded. It was a remarkable admission.

In his written reply to this report, Opposition Parliamentarian Norbert Gansel wondered whether the shipments to Iraq continued out of "coincidence, or does it prove the powerlessness of the government when confronted with big business interests?" Or even worse, Gansel wondered, did the Samarra case point to an "undeclared government policy?" Despite insistent requests by Gansel and other German parliamentarians, the Federal Government in Bonn has never provided a more detailed accounting of poison gas shipments to Iraq, either in public or in executive session.

F. Short-list of German Contributors

The count of German companies involved in supplying Iraq with poison gas, ballistic missiles, and the manufacturing equipment to produce them locally is still mounting. But this much is sure: the real 'secrets of Samarra' are not in Iraq, but in Bonn.

The following summary has been extracted from the more complete data base listing in the appendix. Interested readers can refer to that listing for source material.

Anton Eyerle:

mobile toxological labs

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Aviatest (Rheinmetall subsidiary):	production equipment for the Samarra plant; wind tunnels to the Saad 16 R&D complex in Mosul
BP (Germany):	chemicals research equipment
Blohm (a Körber AG subsidiary):	machine-tools to the Saad 16 R&D center
Carl Zeiss:	unspecified equipment to CW plants
Degussa:	unspecified equipment to Saad 16 R&D center
Fritz Werner Industrie :	CNC machine-tools
Gildemeister Projecta GmbH:	Main contractor for Saad 16 R&D research center, which was signed on 16/1/84
Heberger Bau GmbH:	Construction work on chemical weapons plants
I.B.I. Engineering:	Construction of CW plants; used as middleman by Preussag for CW equipment deliveries
Infraplan:	Nerve gas plant in Falluja (Project 9230)
Integral/Sauer Informatic/ICME:	Computer programming for Saad 16 R&D complex
Iveco/Magirus- Deutz:	Vehicles for mobile toxicological laboratories
Josef Kühn:	Bacteriological weapons (Mycotoxins TH-2, T-2)
Karl Kolb:	Principle supplier of equipment and chemicals for Samarra plant. In July 1987, got additional order to contribute to chemical weapons research lab at Saad 16.
Körber AG:	machine-tools for Saad 16
KWU:	nuclear technology
Mauser:	machine tools for weapons production; weapons R&D

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MBB:	laboratory equipment for CW research; extensive cooperation for on Iraqi missile programs via the Consen Group in Zug, Switzerland; provided training, drawings, engineering support; fuel-air explosives licenses.
Pilot Plant:	extensive deliveries of production equipment for Samarra and al-Falluja CW plants. In 1989, the company was dissolved.
Plato-Kuehn	Toxins for biological weapons
Preussag:	Special water-purification equipment for Samarra CW plant
Quast:	Reactor vessels for Sarin production
Rhema-Labortechnik:	Ventilation systems for CW research unit at Samarra
Sigma Chemie:	Bacteriological weapons, precursor virus
Thyssen:	Weapons and munitions manufacturing equipment
Tesa:	Unknown manufacturing equipment
Transtecnica (an MBB subsidiary):	Principle technology supplier for Saad 16 R&D complex. Was searched by German Customs in 1989.
WET Engineering:	CW Precursors for mustard gas, Sarin, and Tabun; Sarin and Tabun production lines at al-Falluja CW plant. The managers of this company were arrested in 1990.
WTB Walter Thosti Boswau:	Equipment for manufacturing nerve gas

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G. Project 395

Poison gas is inherently a weapon of barbarity and terror. But coupled to ballistic missiles, capable of delivering CW warheads to targets hundreds of kilometers away, poison gas becomes a strategic weapon, capable of altering the regional, and even global balance of power.

Project 395 is the overall name given by Iraq's Military Production Authority to its ballistic missile projects. From the very start, Iraq has developed these and other delivery vectors (long-range penetration bombers, such as the Mirage 2000, or the "super-gun" of assassinated Canadian ballistics engineer, Dr. Gerald Bull) as a means of extending its influence throughout the Middle East, and from there, to the entire Mediterranean world. Like the chemical weapons programs, Project 395 was spearheaded by Iraq's German-trained chemist, Lt. General Dr Amer Hammoudi al Saadi.

There were four main parts to Project 395.

- a state-of-the-art research and development complex, called Saad 16, engineered by German and Austrian firms in Mosul;
- a "metal-bending" plant, where missile bodies were altered (for the SCUD-B upgrades), or manufactured from scratch (for Iraq's solid-fuel missile projects). This was dubbed Project 124, and was co-located with the Tabun and Sarin production plant near the town of al-Fallujah;
- a solid fuel propellant manufacturing plant called Project 96, built at al-Hillah, 17 km south of Baghdad. This was where the British

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journalist Farzod Bazoft had travelled to investigate a major explosion which occurred in August 1989³⁷;

- the An-Anbar Space Research Center, built in the desert near Kerbala, where Iraq launched its first experimental three-stage rocket on December 5, 1989.

Since April 1987, many of the technologies Iraq has been seeking for its missile programs have fallen under Missile Technology Control Regime (MTCR) guidelines. Before that time, Iraq purchased much of its best technology in the United States, in perfectly legal deals approved by the Department of Commerce.

In a February 27, 1985 letter sent to DoC from the Director of the Saad General Establishment (the general contractor for Saad 16), M.B. Namody, said the center would contain 76 labs and workshops. A list he appended to his letter got more specific. Most of the labs dealt with fields applicable to missile and Chemical weapons research, such as fuel production, vibration and friction effects, the stability of mixtures, aerodynamics, turbo machines, microwaves, etc.

Here are a few examples of equipment approved for sale by the DoC to the Saad 16 R&D facility in Mosul.³⁸:

- On May 9, 1985, a German firm requested export of a U.S. televideo graphics display to Saad 16 (DoC Case A897641). The case was approved without condition.

- On July 5, 1985, an American firm sought to export electronic equipment to Saad 16, including a 100 Hz spectrum analyzer, network analyzer, five 18 GHz electronic counters, and six 275 MHz oscilloscopes (DoC case BO17620). The case was approved without condition.

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- On September 3, 1985, an American firm sought to export a hybrid electronic computer system for use in the complex (DoC case B042361). The case was suspended.

- On December 26, 1985, an American company sought to export a 10 MHz-40 GHz scalar network analyzer system to Saadi 16 (DoC case B075875). The case was approved without condition.

Even after the signature of the MTCR, a few cases got through. Among them were these:

- On June 3, 1987, a U.S. company requested permission to export a 19.9 Mbit computer system to Saad 16 "for process control and data evaluation (DoC case 232594). The case was approved without conditions.

- On April 28, 1988, an American firm tried to export two linear microcircuits to the University of Mosu for use in an oscilloscope (DoC case B320131). The case was approved without conditions.

But for the most part, the MTCR forced Iraq to seek engineering and state-of-the-art missile technology elsewhere.

Once again, it turned primarily to West Germany.

H. The MBB/Consen Connection

According to press accounts appearing in Austria, West Germany, and Great Britain, Messerschmidt Bölkow Blohm was the prime contractor of Iraq's solid fuel missile programs.³⁹ Norbert Gansel, the Opposition Parliamentary expert in Bonn, says MBB began a basic research program in Iraq in 1984, but told the West German government it would "phase out" its cooperation with Iraq in 1985 because the military purpose of the program had become known⁴⁰ By 1987, MBB was

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still present in Iraq - in the Saad 16 R&D complex in Mosul, and elsewhere. But soon thereafter the German aerospace giant passed on its share to a Swiss-base consulting group called Consen.

In fact, Consen's Director, Karl Adolf Hammer, had been chief of MBB's Armaments Technology Division until 1987⁴¹, and when he set up Consen he brought over as many as one hundred MBB engineers. Consen continued to work with an MBB subsidiary, MBB Transtechnica, to acquire specialized equipment for Saad 16. And it set up a web of front companies specialized in clandestine technology procurements throughout Europe.

Wholly-owned Consen subsidiaries began operating in Monaco (Consen S.A.M, Consen Investment S.A.M), Switzerland (Condor Projekt A.B., IFAT Corporation Ltd, Consen S.A., Desintec A.G), Austria (Delta Consult GmbH, Delta System GmbH), Jersey (Transtechno Ltd), and West Germany (GPA, PBG).⁴² Consen also sought technologies from Sagem in France (inertial guidance systems), Snia BpD in Italy (solid-fuel propellants), Bofors in Sweden (electronics), Wegmann in West Germany (rocket launch systems) The German transport giant, M.A.N, provided essential parts of the missile launch vehicle.

MBB apparently kept working on the missile projects until very recently. A BBC documentary in September 1990 stated that MBB had provided Iraq with sophisticated warhead technology⁴³, which it may have gleaned from its participation in SDI research carried out for the U.S. Department of Defense⁴⁴

And these were only some of the largest suppliers of Iraq's ballistic missile programs. Here are a few more:

In Austria:

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- Consultco, an engineering firm drew up design plans and blueprints for the Saad 16 plant;
- Hutter und Shranz, a construction firm that sent workers to build weapons labs at the Mosul site;
- Ilbau, an explosives expert that provided special "blow-out walls" for the missile test labs and explosive labs. If there was an accident, these shelters were designed to pop-out to allow explosive energy to escape instead of destroying the entire building;

In Germany:

- Blohm Maschinbau, Waldrich-Siege, and Fritz Werner provided Computer-controlled numerical machine-tools for various weapons plants;
- Gildemeister Projecta of Bielefeld provided a wide variety of machine-tools, engineering and contracting services, and was the prime contractor for the Saad 16 facility;
- Integral/Sauer Informatic/ICME, provided 10.6 million DM of computer programs;
- Leifeld & Co provided sophisticated rocket nozzles, a stumbling block to many Third World missile programs;
- Siemens provided special electronics for the automatic control of complex rocket fuel mixtures;

Other suppliers are listed in the data base in the appendix.

Conclusion

Iraq has pursued its strategic weapons plants with a determination rarely seen in the Third World. Its engineers and industrial managers

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have shown increasing expertise at selecting programs and promising technologies, and for getting them organized in record time. They have also proved themselves to be masters of black market procurement. Over the past decade, Iraqi buyers have literally run circles round Western intelligence agencies. And in most cases, they did so by finding allies at the political level of Western governments who would support their purchasing programs for purely mercantile reasons.

The bottom line was drawn clearly in testimony last year before the U.S. Senate Foreign Relations Committee by the Director of Central Intelligence, William Webster.

Asked whether Iraq or Libya could have developed its poison gas production capability alone, he replied: "the principle is that none of these countries were able to develop their own capability without foreign assistance. Much of that foreign assistance came from West German companies."⁴⁵

II. Libya

Introduction

Libya has benefitted almost as much as Iraq from a "special relationship" with West Germany. In the 1970s, West German engineers from MBB set up the Otrag group, an engineering company much like Consen, devoted to building a medium-range ballistic missile in Libya. Indeed, the Otrag test range, located near the desert town of Sebha, has since been converted to chemical weapons production - again, with West German help.

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It was Libya's construction of a poison gas plant at Rabta more than anything else (including Iraq's use of poison gas during the Iran-Iraq war) that drew international attention to the problems of CW proliferation in the Middle East.

The outlines of the Rabta story have been widely reported in the international press. For this reason we shall only summarize the Rabta affair in the account below. Instead, we shall focus on the political question of what the West German government knew about the sale of CW technology to Libya, and when they knew it.

The involvement of a wide-ranging network of West German companies in the construction of the Rabta complex became an acute embarrassment to the Kohl government, and led to the disclosure of one of the most extraordinary public documents ever released. We shall draw extensively from the Schauble report, which reveals previously classified information developed by the Federal Intelligence Service (BND) and other agencies, in the account below. It is a story of duplicity, willfull blindness, and outright lying.

A. Quiet beginnings

At the State Department briefing on Wednesday, September 14, 1988, Spokesman Charles E. Redman was prepared to launch a bomb.

It may be that Redman and his superiors in the Reagan Administration really believed the West German and Japanese governments would own up to the fault the State Department was about to ascribe to them, and quietly clean up their act. If so, they were mistaken. For when Redman announced that the United States had

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concluded that Libya had the ability to produce chemical weapons and was about to begin manufacturing poison gas, the reply from Tokyo and Bonn was unanimous: silence.⁴⁶

More details were provided in an NBC News broadcast that evening. The American network revealed that Libya planned to make nerve gas and would soon be producing mustard gas at a plant 80 kilometers south of Tripoli. It was the beginning of the Rabta affair.

Over the next days, U.S. officials said they had expressed concern to Japan that a Japanese company might have been involved in building the poison gas plant. In Tokyo, the daily Mainichi Shimbun named the potential offender as the Japan Steel Works, a member of the Mitsui Group.

But it took several weeks before unnamed West German companies were fingered publicly. And it wasn't until January 1, 1989 that the name of Imhausen-Chemie was first mentioned as the prime contractor of the "Pharma-150 Pharmaceuticals" plant, in Rabta, Libya⁴⁷.

B. The Storm erupts

The West German government publicly expressed irritation over what it considered to be the American "leaks." In a January 4, 1989 report in the Washington Post, unnamed West German officials acknowledged that they had launched an investigation into five West German firms after CIA representatives told Bonn officials on December 22 that the five had participated in the Rabta project. "But the Bonn government has been frustrated by the lack of information provided by the United States, which so far has amounted only to two spy satellite

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photographs and the names of the companies, according to an official," the Post account read. The West German "official" added: "We have asked for more."⁴⁸

That same day, West German Foreign Minister Hans-Dietrich Genscher added his voice to the chorus of complaint. Bonn had "no evidence" proving a West German company had helped Libya build a poison gas plant, the Associated Press reported from Bonn.⁴⁹ A spokesman for Mr. Genscher said that West Germany had asked the United States for "additional material" to back up its assertions. Helmut Kohl later complained about the American mud-slinging campaign. "This is no way to treat friends."⁵⁰

Only on January 12, 1989 did the West German authorities manage to seize twelve boxes of documents containing some of the Rabta contracts from the offices of an Iraqi-born middleman, Ihsan Barbouti. Barbouti's IBI Engineering was said to have orchestrated the international procurement effort for the Rabta plant, and may have played a role in Iraqi CW procurement schemes as well. He has since disappeared.

An investigation by Business Week showed that the President of Imhausen, Dr. Jürgen Hippenstiel-Imhausen, had taken an old-timer's black market route. To sell poison gas to Libya, he had gone through Hong Kong, where he set up a shell company called Pen-Tsao-Materia-Medica-Center Ltd.⁵¹ A wide net of European and American companies was subsequently proved to have provided critical help for the plant, including:

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- Preussag (FRG)
- Pilot Plant (FRG)
- Karl Kolb (FRG)
- IBI/Ihsan Barbouti International (FRG)
- IBI Engineering (FRG)
- Philips Petroleum (Belgium)
- De Dietrich (France)

Karl Kolb, Preussag, and Pilot Plant were all familiar because of their dealings with Iraq. Philips was shown to have delivered Thiodyglycol, a direct mustard gas precursor, while De Dietrich provided the glass-lined reactor vessels needed to mix the deadly brew. In Japan, Mitsubishi provided a metal-working plant for the manufacture of howitzer shells and packing them with CW agents, while the Japan Steel Works provided machinery and equipment to outfit the plant.

As the story unravelled, Chancellor Kohl's discomfort deepened. Finally, even George Bush tried to bail him out. "I have never doubted Chancellor Kohl's commitment to the control and elimination of chemical weapons," he said.⁵²

Mr Bush's remarks were diplomatic to the extreme. Why they were, and just how much the West German government knew about the Rabta project was revealed in the Schauble report.

C. The Schauble report

Wolfgang Schauble's official title was Federal Minister for Special Tasks and Chief of the Federal Chancellery. In fact, he was Helmut Kohl's principle troubleshooter, especially once it became apparent that

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vital information developed by West German intelligence on the Rabta case had not reached the West German Chancellor in time, because it had been blocked by his deputy for Security Affairs, State Secretary Waldma Schreckenberger.⁵³

Schauble presented his report to the Bundestag on February 17, 1989, two days after it had been adopted by the German Federal Government. It includes a detailed chronology of what the various West German intelligence services knew about the Libyan poison gas project *as early as April 1980*, and shows that Imhausen-Chemie was clearly identified as a potential supplier to the Rabta plant on July 5, 1985. Although the Schaulble report attempts to innocent the West German government of any responsibility, it is a stirring exposé of the kind of willful blindness that has characterized German attitudes toward poison gas from the very start.

The following remarks are drawn from the Report's preamble:

"Only the information which the Federal Intelligence Service (BND) received on 15 July 1988 was substantial enough to justify preliminary investigations of Imhausen's involvement. The Customs Criminological institute (ZKI) immediately began those Investigations after the information had been evaluated by the BND."

In other words, five months before the U.S. blew the whistle, not only did the West German government know that Libya was building a poison gas plant, but it had substantial evidence proving the involvement of a West German company. And yet, Chancellor Kohl and his Foreign Minister still pleaded ignorance.

"Previous information relating to the possible involvement of German firms," the report goes on, *"had been extremely vague and*

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offered no basis for further investigations. Moreover, the reports differed. Some contained rumours about the possible involvement of German firms (e.g. on 27 January 1988), others suggested that, judging by what was known at the time, probably no German firms were involved in the construction of the chemical weapons facility."

The good news was that "probably" no West German firms were involved in the construction of Libya's poison gas plant. That was reason enough not to investigate further, Schauble argues.

"In a democratic country which respects the rule of law, mere suspicion is not sufficient grounds for legal steps against individuals or companies who may have been involved in the building of a chemical weapons plant in Libya or in any other Libyan activities in the field of armaments. There has to be conclusive evidence. This also applies to public statements by the Federal Government. A person must not be exposed to the danger of being judged in advance, with all possible personal and economic consequences."

This passage is a virtual "green light" to any company wishing to help build a chemical weapons plant in Libya, Iraq, or anywhere else, to hide their tracks and hope for the best. "There has to be conclusive evidence" - a few thousand corpses strewn on a Middle East battlefield, such as occurred in Iraq? - before the Federal government will intervene.

Schauble's presentation is legalistic, and rightly so. He continues:

"Up to 13 January 1989, the ZKI and other customs authorities could merely confirm that Inhausen or firms linked with it

- had probably sent engineers to Libya,*
- had delivered to Hong Kong a control unit as well as*

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- know-how, blueprints and plans for the construction of a pharmaceutical factory. These items might have been reconsigned to Libya. However, at that time no licence was required for the export of the control unit, even to Libya. Under the existing regulations, the export of know-how for the construction of the chemical facilities specified in Part I, Section D is likewise not subject to a licence. And as far as the presence of German engineers and technicians in Libya is concerned, their involvement in the construction of chemical weapons facilities abroad, either in the form of physical work or of technical consultancy, does not constitute a breach of the law."

All in all, the Schauble Report is a remarkable and frank presentation. It unabashedly reveals the shortcomings of West Germany's legal framework, and suggests how similar cases could occur elsewhere.

D. The Chronology

What follows is a select chronology extracted from the Schauble Report. Interested readers can find the full text in the Appendix.

- | | |
|----------------|--|
| 22 April 1980. | The BND reports that, with the help of unnamed East and West German experts, Libya is developing a plant for the manufacture of chemical warfare agents as well as a system for using them..." |
| 22 July 1981. | The BND reports that Libya remains committed to the production of chemical warfare agents and is currently endeavoring to purchase the basic chemicals needed for this purpose in Italy and Spain. |

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- 22 July 1983. The BND reports that Libya has its own plant for the manufacture of mustard gas which attacks the skin. The plant is said to have started production at the end of 1981. Its location is presumed to be near Abu Khammash...
- July 1984. A member of the BND reports... that a former employee of a German company has gone to Libya for one year and earned a great deal of money. It is presumed that he had built a plant for the production of mustard gas next to the Abu Khammash chemicals complex. It is reported that this complex contains a chloride electrolysis facility built by a German company... and that it could produce one of the precursors needed for mustard gas.
- 5 July 1985. The German embassy in Moscow reports on information received from a non-Eastern source indicating that the Imhausen Company in Lahr (proprietor Dr Hippenstiel) has concluded a contract in Hong Kong to provide supplies for a pharmaceutical project. A state-owned German company is said to be involved... It is said that Libya had been mentioned as the true country of destination.
- 19 July 1985. The BND replies to the AA (Foreign Minister) saying that no information is available concerning the embassy report.
- 28 January 1986. The BND reports that the plant for the manufacture of mustard gas in Libya is said to have been constructed under the management of a member of a German company identified by name... Precursors... are thought to have been purchased by bogus Greek, Maltese and British firms, though these have not yet been identified. The chemical Industry Association was then warned to pay particular attention to any sales made via agents from the above-mentioned countries.

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- 7 February 1986. The BND reports on news from an allied intelligence service according to which 100 tons of sodium fluoride may have been shipped from Zeebrugge to Libya on the Panamanian freighter "Capira" at the beginning of October 1985. This is said to involve a German shipping company identified by name.
- 28 October 1986. The Federal Office for the Protection of the Constitution (BfV) is requested by an allied intelligence service to supply intelligence on the IBI business operation in Frankfurt in the light of its believe that ...[it] had been commissioned to set up a microbiological research centre in Libya... since there is no apparent terrorist background, the data is not stored. Other authorities were not informed at the time. A renewed inquiry on 18 August 1987 led to the same treatment of the matter.
- 22 June 1987. Daily briefing by the BND. According to information from an allied intelligence service, a warfare agents factory is about to be completed near Rabta with a production capacity estimated at 1 to 3 tons of sarin per day.
- 3 August 1987. The BND confirms from its own intelligence (SPOT satellite pictures) that the new industrial plant near Rabta is most likely the new warfare agents factory.
- 3 February 1988. The German embassy in Tripoli reports that after questioning representatives of German construction firms investigations have shown that no German companies are involved in the construction of the research facility in Gharyan (Rabta). The supply of equipment has mainly been organized via Switzerland, with German intermediaries and German companies being thought to be involved.

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- 15 March 1988. The Customs Criminological Institute (ZKI) finds out that the IBI company in Frankfurt... is doing business with know-how and industrial plants etc.
- 18 May 1988. The Foreign Ministry [AA] receives a routine level non-paper from the American embassy. It expresses concern over the participation of companies from the Federal Republic of Germany in the supply of chemical facilities to Libya and the re-equipping of Libyan C-130 aircraft to give them mid-air refueling capability:
[The American "non-paper" reads:]
"We understand that several firms from the FRG have provided or facilitated Libya's procurement of equipment... for a probably chemical weapons facility. Among the firms involved in this activity are Sihi GmbH and Co., and Imhausen Chemie GmbH."
- 15 July 1988. The BND receives information from an allied intelligence service concerning possible supplies from German companies for the construction of a poison gas production plant in Rabta. The firms named are IBI, Pen Tsao and Imhausen.
- 2 August 1988. The ZKI and the BND discuss the involvement of the said companies and conclude for the time being that the ZKI should only undertake preliminary investigations into Imhausen and refrain from ordering a foreign trade and payments investigation by inspectors from the customs authority before further information has been gathered.
- 21 Sept 1988. The US embassy hands over to the AA a non-paper, according to which Libya has developed a chemical weapons production capability with outside help, including Western European companies, and is about to begin mass production. The US

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- Administration appears for a stop to any assistance to Libya for the development of its own capability to manufacture and use chemical weapons.
- 20 October 1988. The Federal Chancellor is briefed for the first time on the information gathered by the intelligence services in relation to Libyan efforts to establish a warfare agents factory... This summary also mentions possible involvement of the German company Imhausen.
- 2 Nov 1988. The BND makes contact with an informant who, under certain conditions, is prepared to supply business documents of the companies allegedly involved in Rabta.
- 11 Nov 1988. The AA presents a written briefing to Federal Minister Genscher for his talks in Washington proposing that he make the following points:
- US evidence provided in October 1988 has been looked into, but so far nothing has been found on Germans or German firms violating the Foreign Trade and Payments Act.
 - There is no verified information on the activity of Germans in the Libyan chemical weapons plant. Even if this were the case, the Federal Government would have no effective lever to prevent the mere participation of Germans in such projects.
- 11 Nov 1988. The information hands over documents to the BND so that it can check the authenticity of the material he intends to supply.
- 15 Nov 1988. At the meeting with Secretary of State Shultz in Washington the Federal Chancellor and foreign Minister Genscher are given evidence by CIA Director Webster on the involvement of German

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companies, including Imhausen and IBI, in the alleged chemical weapons plant in Rabta.

- 14 Dec 1988. ZKI Investigators meet with the informant and receive a file containing documents. The file includes:
- specifications for the Pharma 150 project
 - accounts sent by foreign firms to IBI
 - miscellaneous correspondence with German and foreign companies concerning Pharma 150
 - construction drawings.

However, there is no evidence that violations were committed against the Foreign Trade and Payments Act. In particular, there is no evidence of goods supplied by German firms.

- 22 Dec 1988. Meeting with US delegation at the Federal Foreign Office. The US experts present photographic material on the Pharma 150 chemical plant to the German colleagues and report on an assembly accident in August 1988. They are convinced that the plant is a chemical weapons production plant.

- 2 January 1989. Start of the foreign trade and payments inspection of the Imhausen company by the Freidburg Regional Finance Office (OFD). The public prosecutor's office in Offenburg is informed. It does not believe at this point that the prerequisites for a formal investigation are met and therefore only starts to officially monitor events.

E. From Rabta to Sebha

At one point in January 1989, Israeli intelligence officials estimated that the Rabta plant was capable of producing 42 tons of mustard gas and

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Sarin nerve agent a day - more than most estimates of Iraq's poison gas production⁵⁴. While there is no evidence that Rabta ever reached this level of production, the plant was restarted once the initial uproar died down and produced an initial batch of 30 tons of mustard gas. ABC News reported on March 6, 1990 that production of nerve and mustard gas had begun once again in late 1989. The State Department confirmed the report at a briefing the next day.⁵⁵

One week after these reports, a mysterious fire was said to have broken out at the Rabta plant. In fact, the fire appears to have been an elaborate hoax dreamed up by Colonel Qaddafi as a means of forestalling an American air strike against the plant. A comparison of SPOT Image photos of the Rabta site taken on March 12, 1990 (before the alleged fire) and on March 18, 1990, showed "no trace of a major fire on any of the principle buildings."⁵⁶

During a visit to Israel on May 13, 1990, Chancellor Kohl's new State Secretary for Intelligence, Lutz Stavenhage, revealed disturbing news. "We have reason to believe that a second plant similar to Rabta is being planned," Stavenhage told newsmen. "We successfully managed to cut that part out in which German companies have been involved."⁵⁷ The factory was believed to have been built deep in the desert at Sebha, 650 km south of Tripoli, on the site of the former Otrag missile plant. Der Spiegel reported on May 7, 1990 that Sebha was already up and running and producing napalm, with hydraulic hoists provided by the German industrial equipment giant, Thyssen.

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Conclusion: toward a united will

There is nothing particularly brilliant about the way Iraq and Libya have gone about purchasing poison gas and production technology from Western Europe and the United States. They have merely followed tried and true methods employed by arms smugglers everywhere. Smugglers, or "Technobandists" as they are sometimes called, will always seek the weak point in national legislations. One of their favorite techniques is to pit different countries and different enforcement agencies against one other, while they sneak their shipments through in the ensuing chaos.

Forbidden technology shipments have a way of waltzing from country to country, and often covered by an extensive trail of perfectly legal documents and export authorizations. Trade-minded export authorities are loath to reject critical technology exports because they contribute to their nation's positive foreign trade balance. This proven conflict of interest should disqualify such agencies from the export licensing process of strategic goods in the future.

What the cases of Libya and Iraq have shown is that legislation is not enough to prevent this type of critical technology export. Controls of precursor chemicals existed on the books in nearly all the supplying countries. And yet, those chemicals and other technologies got through.

In addition to stricter legislation, what is needed is a will. A will to prevent the proliferation of technologies and precursors which, in the hands of determined Third World leaders, directly contribute to the development of weapons of mass destruction.

Of course, this will require a certain economic sacrifice, however modest. But the price in lost contracts pales in comparison to the

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astronomical costs of stopping the expansionist drive of leaders like Saddam Hussein.

One editorialist in the French newsweekly *l'Express* recently called for a "Technological apartheid" against Third world countries such as Libya and Iraq. He argued that high-tech purchases more often than not resulted from the "meglomaniac desires" of local elites than from any true need of Third World populations. "By refusing to transfer to Third World nations the *nec plus ultra* of its capacity for innovation, the West will in fact benefit local populations instead of their elites." ⁵⁸

Three distinct technology control regimes already exist: COCOM, which controls strategic technology exports to the former Soviet bloc; MTCR, which controls ballistic technology exports to the Third World; and the Non-Proliferation Treaty which controls the spread of nuclear technologies to non-nuclear nations. Despite haphazard efforts in the area of chemical technologies since 1984, no unified control regime now exists, primarily because of pressure from the Third World.

The time has come to envisage setting up such a CW control regime, whose partners would not only include the U.S. and Europe (East and West combined), but major Third World producers such as India, Brazil, and the "dragons" of Southeast Asia.

Editor's Note:

This special report has been compiled from open sources and from primary sources in interviews by the author with government officials, industry executives and members of the intelligence community. Only open sources have been disclosed in these references.

¹Figures for the 1978-87 period (more than \$52 billion), taken from the Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers*, 1988 edition.

²Middle East Defense News/*Mednews* (10, rue de l'Union, 78600 Maisons-Laffitte, France), 3,21/22 (27/8/90); *L'Express*, Sept 7-13, 1990. The Federal Republic of Germany, prohibited from most foreign arms sales by its Constitution, piggy-backed onto many of the French sales to Iraq through co-production agreements (MBB and Aerospatiale were full partners in the Euromissile consortium which marketed the HOT, Milan, and Roland missiles). Other West German arms sales to Iraq, such as BO 105 anti-tank helicopters, went through intermediaries in Switzerland, Holland, and Spain.

³"Saddam's Secret Arms Ring," BBC *Panorama*, 3/9/90.

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⁴This was the case of the AS30L laser-guided air/surface missile from Aerospatiale, used with success against Kharg island in 1985. It was also the case for the Armat anti-radar missile, which Iraq acquired in 1985 before it had passed qualification trials for the French Air Force.

⁵*Mednews* 3,12 (12/4/90).

⁶"Saddam's Secret Arms Ring," BBC Panorama, 3/9/90.

⁷*L'Express*, Sept 7-13, 1990.

⁸*Der Spiegel* 33/90.

⁹*Mednews* 2, 7/8 (9/1/89)

¹⁰The Salman Pak story was first broken by *Mednews* on January 23, 1989 (Issue 2,9). NBC notes that that two Israeli military bases had previously been infected by exactly the same strain of West Nile Fever as that shipped by the CDC.

¹¹*Der Spiegel*, 33/1990.

¹²*Libération*, 12/3/84; *Sunday Times*, 11/3/84; *Washington Post*, 25/5/88 "Iraq's 13-year Search for Deadly Chemicals."

¹³*Mednews* 24/10/88.

¹⁴Herbert Krosney, "Iraq making deadly form of nerve agent," *Jerusalem Post*, 24/11/86. Krosney was the principle research for the 1986 BBC Panorama documentary on Samarra.

¹⁵*Libération*, 12/3/84. Technipetrol officially denied involvement in the Akashat project.

¹⁶*Mednews* 2,15/16 (8/5/89).

¹⁷*Mednews* 2,2/3 (24/10/88).

¹⁸*Time Magazine*, 10/9/90, p 34. The Federal Government officially informed the West German Bundestag on August 22, 1990 of 12 on-going cases, involving 25 companies, being handled by the various German State prosecutors. An additional 35 cases, involving 34 companies, were being prosecuted by the fiscal authorities.

¹⁹*Mednews* 3, 7/8 (19/1/90).

²⁰*Der Spiegel*, 26/1/89. This is also treated in the Schauble report reproduced in the Appendix.

²¹*Stern*, 26/1/89, and *Der Spiegel* 24/89

²²*Der Spiegel* 28/90.

²³According to *Spiegel*, in mid-1987, H+H agreed to set up an entire uranium enrichment facility in Taji, Iraq. The transfers were handled through an intermediary in London called Nasr Dependence Meed International, which would appear to be a front company for the state-owned Nasr Enterprise for Mechanical Industries in Iraq, in charge of ballistic missile manufactures within the Military Production Authority. H+H Metalform and Nasr Dependence Meed also procured sophisticated nozzles for ballistic missile motors, which were built by the Leifeld & Co. machine-tool builder in Ahlen, West Germany. Other companies across Europe took their share of the business, including the Swiss speciality steel manufacturer, Schmiedemeccanica. And in the United States, nearly a dozen high-tech firms are now under investigation for having provided sophisticated computers and other design tools to Iraqi nuclear procurement rings. (See also *Spiegel* 33/1990).

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Today, no one truly knows how far Iraq is from acquiring a nuclear weapons capability. Estimates range from two to ten years. But one thing is sure: if Iraq does get the bomb, the West will have played a key role.

²⁴*Mednews* 2,2/3 (24/10/88).

²⁵*Mednews* 2,2/3

²⁶*New York Times*, March 30, 1984.

²⁷Herbert Krosney, *Jerusalem Post*, 24/11/86.

²⁸*Ibid.* Krosney reported that these new lines were capable of processing up to 4,000 liters of raw chemicals for poison gas every month.

²⁹Norbert Gansel, a Social Democrat member of the German Bundestag, gives a detailed account of how the Kohl government kept Parliament misinformed of the Samarra case, and of missile technology exports to Iraq, in a Parliamentary briefing paper dated 28 October 1989 entitled "Die deutsche Raketenlücke."

³⁰Interview with the authors, 19/9/90.

³¹*Stern* 10/1/87. *Stern* initially identified the location of the sarin and Tabun production lines as Samarra, but subsequent accounts agree that it was set up in Fallujah.

³²*BBC Panorama*, "Secrets of Samarra," 4/11/86.

³³*Stern* 10/1/87.

³⁴*Stern*, 10/1/87.

³⁵Quoted by David Ignatius, *op cit*, from a 1982 broadcast.

³⁶This two-page report had the epic title: "Zwischenbericht über den Stand der staatsanwaltschaftlichen Ermittlungen wegen des Verdachts illegaler Ausfuhren von Ausrüstungsteilen zur Produktion chemischer Kampfstoffe im Irak." Drucksache 11/3762.

³⁷*The Independent*, 6/9/89.

³⁸Source: internal DoC documents, made available to *Mednews* on the condition their source remain anonymous.

³⁹*Profil*, 8/5/89; *Financial Times*, 20/11/89; various editions of *Stern* and *Der Spiegel*

⁴⁰Social Democrat Party Parliamentary briefing paper dated 28 October 1989 entitled "Die deutsche Raketenlücke."

⁴¹*Profil*, 8/5/89

⁴²Alain Friedman, "The Flight of the Condor, *Financial Times*, 20/11/89) produces a replica of the Consen Group organization chart, reconstructed from internal company documents.

⁴³*BBC Panorama*, 3/9/90.

⁴⁴Sources at the U.S. Senate Foreign Relations Committee said they were investigating a possible conflict of interest that could prohibit MBB from future U.S. defense contracts.

⁴⁵Hearings before the Senate Foreign Relations Committee, March 1, 1989, in *Chemical and Biological Weapons Threat: the Urgent Need for Remedies*, Washington, DC, 1989.

⁴⁶Wire service dispatches, 14/9/88, and *International Herald Tribune*, 15/9/99.

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⁴⁷The *New York Times* ran an interview with the President of Imhausen-Chemie, Murgun Hippenstiel-Imhausen, in its January 1, 1989 edition.

⁴⁸*International Herald Tribune*, 4/1/89.

⁴⁹*International Herald Tribune*, 5/1/89.

⁵⁰*Newsweek*, 23/1/89.

⁵¹"How Qadaffi built his deadly chemical plant," *Business Week*, 23/1/89.

⁵²*Newsweek*, 23/1/89.

⁵³*Mednews* 2,10, 6/2/89.

⁵⁴*Business Week*, 23/1/89.

⁵⁵*International Herald Tribune*, 8/3/90.

⁵⁶Statement by Spot Image dated 18/3/90.

⁵⁷*International Herald Tribune*, 14/5/90.

⁵⁸Jean Villars, "Pour l'Apartheid Technologique," *L'Express*, 7/9/90.

.III. Appendices

.c2.A. *Company register*

The company register, developed from Middle East Data Project® files, contain listings for over 200 companies that have been involved in supplying Iraq with chemical, ballistic missile, or sophisticated weapons technology.

They do *not* include conventional weapons exports. Conventional weapons exports, which have been compiled by the Middle East Data Project®, involve more than 1,000 companies in nearly thirty nations.

Abbreviations:

BW = biological/bacteriological weapons

CW = chemical weapons, technology, and/or precursor chemicals

MT = missile technology and/or manufacturing equipment

Nuclear = nuclear weapons and uranium enrichment, technology, equipment, and materials

WT = weapons technology and/or manufacturing equipment. This category primarily focuses on the "super-gun" case.

Saddam's Foreign Suppliers

Companies supplier Iraq's unconventional weapons programs

Country of domiciliation	Number of firms
Argentina	3
Austria	17
Belgium	8
Brazil	1
Switzerland	11
Egypt	1
France	16
Federal Republic of Germany	86
Greece	1
Holland	2
India	1
Iraq	2
Italy	12
Japan	1
Jersey	1
Monaco	2
Poland	1
Spain	4
Sweden	1
UK	18
USA	18
Total	207

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Data base

Iraq's sources of unconventional technologies

<u>Company</u>	<u>Country</u>	<u>Type</u>	<u>Equipment delivered</u>	<u>Source</u>
Aerotech (Buenos Aires)	Argentina	MT	Consen group, missile tech	FT 20/11/89
Conseltech SA	Argentina	MT	Consen group, missile tech	FT 20/11/89
Intesa S.A. (Cordoba)	Argentina	MT	Consen group, missile tech	FT 20/11/89
AST Consult Co	Austria	CW	Laboratory construction	Profil, 6/3/89
Consultco	Austria	CW	SAAD 16 construction	Spiegel 13/89
Emmerich-Assman	Austria	CW	Owner of Hutter and Schrantz	Profil 6/3/89
Feneberg	Austria	CW	Construction planning	Profil, 24/4/90
Lenhardt Metal Construction and Roofing	Austria	CW	Steel construction, CW plant	Kurier, 13/1/90
Neue Berger	Austria	CW	Percursor chemicals	Austria State Radio, 4/1/89
Swatek and Cerny	Austria	CW	Sanitary equipment	Profil 6/3/89
Consultco	Austria	MT	Saad 16 Engineering	Stern 26/1/89
Delta Consult Studien GmbH	Austria	MT	Electronics, plans (Consen)	Kurier, 13/5/90
Delta System GmbH	Austria	MT	Consen group; missile tech	FT 20/11/89
Girozentrale Bank	Austria	MT	Financing of weapons lab	Profil 6/3/90
Hutter und Shranz	Austria	MT	Construction of weapons lab	Profil 6/3/89
Ilbau	Austria	MT	Blow-out walls, missile plant	Profil, 8/5/89
Denzel	Austria	WT	Helicopters from MBB	AFP
Hirtenberger	Austria	WT	Percussion caps and traction machines	Profil 13/8/90
Steyer-Daimler-Puch	Austria	WT	Nonferrous-metal cartridge case facility	Profil 24/4/90
Voest-Alpine	Austria	WT	GC-45 Howitzers	The New York Times Magazine 26/8/90
Philips Petroleum	Belgium	CW	Thiodiglycol sold to KBS	BBC Panorama 2/2/87
Sebata	Belgium	CW	Built CW plant	The Washington Post 25/8/90
PRB (Poudrieres Reunies de Belgique)	Belgium	MT	Solid fuel, munitions/rockets	Groot Bijgaarden De Standaard 17/5/90, WSJ 19/4/90, At Tayar 4/9/90
Amalgamated Trading Ind. (ATI)	Belgium	WT	Super-gun	Groot Bijgaarden De Standaard 18/5/90, Monde et Vie
Cockerill	Belgium	WT	Super gun parts	
Forges de Zeebrugge Herstal	Belgium	WT	Super gun parts	
Six Construct	Belgium	WT	Air base construction	Mednews 3,21/22 (27/8/90)
Space Research Corp	Belgium	WT	Super-gun prime contractor	
Avibras	Brazil	MT	Joint missile R&D programs	Mednews 1,12 (21/11/88)
Companies Inc.	CH	CW	Chemical precursors	New York Times 31/1/89
IFAT Corp Ltd	CH	CW	Engineering, Saad 16	Spiegel 18/89, Profil 24/4/89
Condor Projekt A.G.	CH	MT	Consen group, missile tech	FT 21/11/89
Consen S.A. (Zug)	CH	MT	Missile technology; provided 150 electronics and computer engineers	FT 20/11/89; NBC News 30/6/89, Kurier (Austria)13/5/90
Desintec A.G. (Zug)	CH	MT	Consen group, missile tech	FT 20/11/89
Schaeublin	CH	Nuclear	Tools for nuclear facility	Berliner Tagesspiegel 22/8/90
Schmiedemeccanica	CH	Nuclear	Centrifuge assemblies	Tages Anzeiger 3/9/90, Berliner Tagesspiegel 22/8/90

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Georg Fischer	CH	WT	Tadji, casting molds, machinery for cannon plant	Spiegel 28/90, 11/7/90
Space Research Corp	CH	WT	Super-gun procurement office	
Von Roll	CH	WT	Taji, super-gun parts	Tribune de Geneve, 17/6/90, the New York Times Magazine 26/8/90
VUF AG (Verwaltung und Finanzierung)	CH	WT	Middleman, financing	Mednews 2/4/90
WTB International AG	Egypt	CW	Saad 16, controller	Spiegel 19/89
Atochem	France	CW	Sarin precursors to Montedison	BBC Panorama 2/2/87
Carbone Lorraine	France	CW	Subcontractor to Protec	Nouvel Observateur 20/9/90
Le Vide Industriel	France	CW	Subcontractor to Protec,	Nouvel Observateur 20/9/90
Pirep	France	CW	Subcontractor to Protec	Nouvel Observateur 20/9/90
Prévoist	France	CW	Subcontractor to Protec	Nouvel Observateur 20/9/90
Protec SA	France	CW	French partner to Karl Kolb; purchased manufacturing equip- ment and Tabun precursors for Samarra plant.	Nouvel Observateur 20/9/90; IHT 21/9/90
SVCM	France	CW	Subcontractor to Protec	Nouvel Observateur 20/9/90
Sagem	France	MT	Missile guidance systems	Mednews No 1.17, 30/5/88, The New York Times 24/5/90
SEP	France	MT	Rocket motors, nozzles	Mednews 3,21 (12/4/90); SEP denies
SNPE	France	MT	Solid rocket fuel (w/Snia Bpd)	Mednews 3, 12 (12/4/90)
Framatome	France	Nuclear	Nuclear fuel for Osirak reactor	CEA
St. Gobain	France	Nuclear	Nuclear Technologies	Mednews 2/4/90
Technatome	France	Nuclear	Osiris nuclear reactor	CEA
Usinor-Sacilor	France	Nuclear	Special steels for centrifuges	Spiegel, 8/90
Intespace	France	WT	High resolution infrared cam- eras for observation satellites. Via Brazil?	Defence, Dec. 1989
Thomson-CSF	France	WT	Saad 13 electronics factory	Jane's Defense Weekly, 6/4/85
Tesa	FRG	??	??	Monde et Vie 23/8/90
Josef Kühn	FRG	BW	Mycotoxins TH-2, T-2	Spiegel 33/90
Anton Eyerle	FRG	CW	Mobile toxological labs	Spiegel 4/89
Aviatest (Rheinmetall subsidiary)	FRG	CW	Saad 16: wind tunnel for for missile and aerodynamics research	Spiegel 33/1990, Profil 6/3/89
BP	FRG	CW	Military research	Spiegel 13/89, 33,90
Carl Zeiss	FRG	CW	Equipment for Saad 16 CW lab	Spiegel 13/89, 33/1990
Deutsch BP	FRG	CW	Military research	Spiegel 13/89, 33/1990
Heberger Bau GmbH	FRG	CW	Buildings for CW plant	Bundestag, 20/12/88
I.B.I.	FRG	CW	Construction, procurement	Spiegel 3/89, Stern 26/6/89
Industriewerke Karlsruhe, Augsburg (IWKA)	FRG	CW	Machinetools, CW packing	Spiegel 24/6/89
Infraplan	FRG	CW	Project 9230, nerve gas plant,	Stern 1/89, NBC News
Iveco/Magirus /Deutz	FRG	CW	Vehicule for mobile labs	Spiegel 4/89
Karl Kolb	FRG	CW	Saad 16, laboratory equipment for material testing; biological agent equipment; Prime contractor of Samarra CW plant	NYT 8/8/84, Spiegel 3/89, Stern 27/3/89, ChristianScience Monitor 13/12/89
MBB	FRG	CW	CW lab equipment for Saad 16	Stern 26/1/89
Pilot Plant, dissolved	FRG	CW	Equipment for Samarra plant	Spiegel 3/89, NY Times
Plato-Kuehn	FRG	CW	Toxins	Spiegel 30/1/89

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Preussag	FRG	CW	Water-treatment, buildings for Samarra CW facility	BBC Panorama 2/2/87, Spiegel 13/8/90
Quast	FRG	CW	Reactor vessels for Sarin; corrosion-resistant alloy parts	BBC Panorama 2/2/87, Christian Science Monitor 13/1/89
Rhein-Bayern Vehicle Construction	FRG	CW	Mobile toxicological lab	Spiegel 13/8/90
Rhema-Laborteknik	FRG	CW	Inhalation system for toxic research	Spiegel 4/89
Sigma Chemie	FRG	CW	Precursors for BW	Washington Times 31/1/89
Sigma Chemie	FRG	CW	??	Monde et Vie
W.E.T Engineering	FRG	CW	Precursors, production plant	Spiegel 34/90, NY Times
WTB Walter Thost Boswau	FRG	CW	Nerve gas plants	Stern 26/1/89
AEG	FRG	MT	Weapons and ammunition production equipment	Spiegel 33/1990
Blohm Maschinbau	FRG	MT	Saad 16, computer controlled grinding facilities	Spiegel 13/89, 33/1990
Brown Boveri	FRG	MT	Electronics	Profil, 8/5/89
Daimler-Benz	FRG	MT	Vehicles	Monde et Vie 23/8/90
Degussa	FRG	MT	Saad 16, military research; unspecified equip at CW plant	Spiegel 13/89, 33/1990
Fritz Werner Industrie Ausrüstungen	FRG	MT	Machine-tools	Spiegel 13/89, Monde et Vie 23/8/90
Gildemeister Projecta GmbH	FRG	MT	General contractor for SAAD16 missile programs, computer programs; supplied machine tools, test equipment	Stern 26/1/89, 9/8/90 Spiegel 13/89, 24/90
GPA	FRG	MT	Consen group	Financial Times 21/11/89
Integral/Sauer Informatic/IC:E	FRG	MT	Saad 16, computer programs	Stern 26/6/89
Leifeld & Co	FRG	MT	Rocket nozzles, via Nasr (GB)	Der Spiegel 28/90
M.A.N.	FRG	MT	Tadji, missile launcher parts	Financial Times 21/11/89, Spiegel 28/90
Machinenfabrik Ravensburg	FRG	MT	machine-tools	Spiegel 33/1990
Mauser-Werke	FRG	MT	Saad 16, research	Spiegel 13/89, 33/1990
MBB	FRG	MT	Training, engineering, R&D; electronics & testing of Condor II missile	Stern 9/8/90
Nickel GmbH (Hamburg)	FRG	MT	Climate control, missile plant	Vienna Profil, 8/5/89
PBG (Freiburg)	FRG	MT	Consen group; missile tech	FT 20/11/89
Promex Explorations GmbH	FRG	MT	Middleman, CW, missile tech	Mednews 3,12 (12/4/90)
Rheinmetall	FRG	MT	Tadji, missile propellants; parent firm of Aviatest	Spiegel 28/90, Monde et Vie, Profil 6/3/89
Siemens	FRG	MT	Electronic rocket fuel mixers; precision lathes and computer control equipment; programming equipment for Tadji complex; non-echoing room for Saad 16 missile R&D	(DS 27/3/89)
International Trade Consulting SA	FRG	MT	Main Saad 16 subcontractor, providing lab equipment for missile and CW R&D	Stern 26/1/89; NBC News, 3/3/89, Spiegel 18/89, 19/89
Transtecnica (MBB subsidiary)	FRG	MT		K. Timmerman; La Grande Fauche (Paris, Editions Plon, 1989).
Waldrich-Siegen	FRG	MT	Machine-tools at missile plant	Financial Times 20/11/89
Wegmann	FRG	MT	Tractor rocket launch system	

Weiss Technik	FRG	MT	Hot & cold chambers	Vienna Profil, 8/5/89
Dillinger Huette-Sarstahl	FRG	Nuclear	Special steels for centrifuges	Spiegel, 13/8/90
Export-Union GmbH	FRG	Nuclear	Metal for production of gas centrifuges	Spiegel 13/8/90
Ferrostaal (MAN subsidiary)	FRG	Nuclear	Main contractor, Tadj	Spiegel 28/90, 32/90, 33/90
H+H Metalform GmbH	FRG	Nuclear	Rolling mill to manufacture centrifuges, computer controlled facility for material checks, hardening of cannon barrels, cartridge cases, missile bodies	Spiegel 9/7/90, 13/8/90, 33/90, AFP
Inwako GmbH	FRG	Nuclear	Ring magnets for uranium enrichment processing plant; SCUD-missile upgrade	Spiegel 35/90, 20/8/90
KWU	FRG	Nuclear	Reactor core technologies	Mednews 2/4/90
Leybold AG	FRG	Nuclear	Tadji, high-temperature furnace; recasting plants for cannon factory	Nucleonics Week 9/8/90, Spiegel 6/8/90, 32/90, 33/90
M.A.N. Technologies Ltd	FRG	Nuclear	Middleman for H+H	Der Spiegel 18/12/89
Nukem	FRG	Nuclear	U-235 fuel pins; blocked	Spiegel 33/1990; Energy Daily, 2/10/80
Saarstahl	FRG	Nuclear	Maraging steel for centrifuge production at Tadj complex	Spiegel 33/1990
TüV	FRG	Nuclear	Materials testing, Tadj	Spiegel 33/90
ABB (Mannheim)	FRG	WT	Electrical equipment for furnaces at Tadj complex	Spiegel 28/90, 33/1990
Buderus, Feldmühle subsidiary	FRG	WT	Casting technology for cannon plant at Tadj	Spiegel, 32/90, 33/1990
Daimler Benz	FRG	WT	Security vehicles	Der Spiegel 27/3/89
Dynamit Nobel (Troisdorf)	FRG	WT	Explosives	Spiegel 33/1990
Faun	FRG	WT	Transportation facilities	Spiegel 13/8/90
Hochtief (Essen)	FRG	WT	Construction, Tadj	Spiegel 28/90, 32/90, 33/1990
Klöckner Industrie-Anlage GmbH	FRG	WT	Steel boiler, foundry, compressors, machine parts for Tadj	Spiegel 9/8/90, 32/90, 33/1990
Krauss-Kopf	FRG	WT	Unspecified equipment at weapons plant	International Herald Tribune 7-8/1/89
Lasco Umformtechnik	FRG	WT	Weapon and ammunition manufacturing facilities	Spiegel 33/1990
LOI Industrieofenanlagen	FRG	WT	Special furnaces for hardening steel at Tadj complex	SPIEGEL 32/90, 33/1990
Ludwig Hammer	FRG	WT	Unspecified equipment at weapons plant	International Herald Tribune 7-8/1/89
M.A.N. Roland	FRG	WT	Transportation equipment	Spiegel 13/8/90
Mannesmann (Duisberg)	FRG	WT	Super gun components	Spiegel 33/1990
Mannesmann Demag-Hüttentechnik	FRG	WT	Casting equipment for Tadj	Spiegel 28/90
Mannesmann-Rexroth	FRG	WT	Components for super-gun	Groot Bijgaarden De Standaard (Belgium) 8/5/90
Marposs (Krefeld)	FRG	WT	Weapon and ammunition production facilities	Spiegel 33/1990
Matuschka	FRG	WT	Parent of Leico (Leifeld & Co)	Spiegel 9/7/90
MBB	FRG	WT	License for fuel-air explosives	BBC Panorama 3/9/90
Ravensburg	FRG	WT	Boring equipment for cannon manufacturer at Tadj	Spiegel 32/90, 33/90
Ruhr gas	FRG	WT	Tadj	Spiegel 32/90, 33/90

Schirmer-Plate-Siempeklamp	FRG	WT	Weapon and ammunition production facilities	Spiegel 33/1990
Schmidt, Kranz & Co	FRG	WT	Computer controlled facility for materials checks, hardening of artillery tubes	Spiegel 33/90
SMS Hasenclever	FRG	WT	Forging press for Tadji	Spiegel 32/90, 33/1990
TBT Tiefbohrtechnik	FRG	WT	Machine tools, Tadji complex	Spiegel 32/1990
Thyssen	FRG	WT	??	Spiegel 33/1990 (13/8/90)
Züblin	FRG	WT	Steel plant at Tadji complex	Spiegel 28/90, 33/1990
Dango & Dienenthal	FRG	WY	Molten metal treatment, Tadji	Spiegel 9/7/90, 33/1990
Körber AG (parent firm of Blohm)	FRG	MT	Machine-tools for Saad 16	Spiegel 13/89
Advanced Technology Institute	Greece	WT	Super-gun engineering w/SRC	NYT Mag 26/8/90; Figaro 1/6/90
KBS	Holland	CW	Thiodiglycol	BBC Panorama, 2/2/87
Melchemie	Holland	CW	Precursor chemicals	Spiegel 3/89, Christian Science Monitor 13/12/88
Transpek India Ltd	India	CW	Trionyl chloride	Far Eastern Economic Review, 30/8/90
Teco (German-owned)	Iraq	CW	Tadji, (middle-man??)	Spiegel 33/90
Al-Arabi Trading company	Iraq	MT	State-owned front; owns TDG	MEED, 22/9/89
Ausidet	Italy	CW	Sarin precursors for Montedison	BBC Panorama, 2/2/87
Montedison	Italy	CW	Sarin Precursors to Melchemie	BBC Panorama 2/2/87
Snia Techint (Fiat group)	Italy	CW	CW lab for Saad 16	Mednews 3,12 (2/4/90)
Technipetrole	Italy	CW	Nerve gas plant, Akashat	Libération 12/3/84
Snia Bpd	Italy	MT	Solid rocket fuel	Mednews 3,12 (12/4/90)
Euromac (European Manufacturer Center)	Italy	Nuclear	Iraqi front; krytron triggers	AFP, AP, 29/3/90, Spiegel 9/7/90
Snia Techint (Fiat group)	Italy	Nuclear	Hot Cells for Thuwailaitha	L'Express 4/10/80
BNL (Banco Nazionale del Lavoro)	Italy	WT	Financing	
Danieli	Italy	WT	Tadji, steel rolling mill	Spiegel 28/90
Ilva	Italy	WT	Forge equipment	Monde et Vie 23/8/90
Istituto per la Ricostruzione Industriale (ILVA)	Italy	WT	Owens Fucine; super-gun parts	Reuters 14/5/90
Societa delle Fucine	Italy	WT	Super gun parts (ILVA)	Reuters 14/5/90, Financial Times, 15/5/90
Minolta	Japan	WT	Duplicating equipment	NBC News, Monde et Vie
Transtechno Ltd	Jersey	MT	Consen group, missile tech	FT 20/11/89
Consen Investment S.A.M	Monaco	MT	Consen group, financing	FT 20/11/89
Consen S.A.M	Monaco	MT	Consen group; Missile tech	FT 20/11/89
Chemadex	Poland	Nuclear	Repair work on uranium processing plant	Washington Post 25/8/90
Int'l Trade Consulting SA	Spain	MT	Middleman, missile tech	Mednews 3,12 (12/4/90)
Casa	Spain	WT	Helicopters from MBB	AFP
Trebelan	Spain	WT	Steel cradles for super-gun	Financial Times 26/5/90, Monde et Vie 23/8/90
International Trade Consulting SA	Spain	MT	Middleman for missile tech	Mednews 3/12 (12/4/90)
Bofors	Sweden	MT	Electronics; Missile launchers	Financial Times 26/5/90, Monde et Vie 23/8/90
Canira Technical Corp	UK	MT	50% share owned by TDG; attempted buyout of Learfan, Belfast, to acquire carbon-carbon technology	MEED, 22/9/89
Matrix Churchill	UK	MT	Machine-tools, precision lathes (owned by Iraq)	WSJ, US News and World Report 4/6/90, MD
Nasr Dependance Meed Int'l	UK	MT	Iraqi front; rocket nozzles	Der Spiegel 28/90
SRC Composites	UK	MT	Joint venture SRC/TDG; attempted buy-out of Canira/ Learjet factory in Ireland, 1989	Financial Times 17/4/90
TMG Engineering	UK	MT	Iraqi front (TDG); bought Matrix-Churchill	MEED 22/9/89

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Trade Development Group	UK	MT	Iraqi-owned front, MT & WT purchases, finance of carbon-tipped machine tool plant	BBC Panorama 3/9/90, Mednews 2/4/90
Transtechno UK	UK	MT	Consarc group, missile tech	FT 20/11/89
Consarc Engineering	UK	Nuclear	High-temperature ovens	NY Times 16/7/90
Astra Holdings	UK	WT	Super-gun parts, owner of PRE	WSJ 19/4/90, MD, AFP 5/5/90
BSA	UK	WT	Machine-tools for weapons plants	BBC Panorama 3/9/90
Eagle Trust	UK	WT	Owner of Halesowen (equipment for super gun)	Monde et Vie 23/8/90
Global Technical & Management International	UK	WT	Mine detection, acoustic detectors for sea mines	London Press Association 30/3/90, Monde et Vie 23/8/90
Halesowen	UK	WT	Parts for SRC supergun	London Press Association 17/4/90
Int'l Highway Transports	UK	WT	Transport of super-gun parts	TRT-TV 29/4/90; Monde et Vie 23/8/90
Meed International	UK	WT	Iraqi front; machine-tools	BBC Panorama 3/9/90
Sheffield Forge Masters	UK	WT	Super-gun barrils	Reuters, AP, 11/4/90
Space Research Corp	UK	WT	Super-gun procurement office	Reuters, AP, 11/4/90
Walter Somers	UK	WT	Hydraulic equipment, super-gun	Wall Street Journal 23/4/90
Center for Disease Control	USA	BW	West Nile Fever virus	NBC News, 11/4/90
Al Haddad Trading	USA	CW	Sarin precursors	BBC Panorama 2/2/87
Alcolac International	USA	CW	Precursor chemicals	US News and World Report 4/6/90
Nu Kraft Mercantile Co	USA	CW	Precusor chemicals	New York Times 31/1/90
United Steel and Strip Corporation	USA	CW	Precursor chemicals	New York Times 31/1/89
US Steel and Strip Corp	USA	CW	??	Monde et Vie 23/8/90
Lummus Crest	USA	CW	Ethylene oxide	Washington Times 27/4/90
Electronic Associates, Inc	USA	MT	Computers for missile R&D	ABC News 7/9/90
Hewlett Packard	USA	MT	Computers for missile R&D	Mednews 3,12 (2/4/90), Washington Post 3/5/89
Scientific Atlanta	USA	MT	Computers for missile R&D	Washington Post 3/5/89
Wiltron Company	USA	MT	Computer equipment, scalar analyzer system	L'Express 7/9/90, Washington Post 3/5/89
XYZ Options	USA	MT	Carbon-tool machine tool bits	Financial Times, 21/11/89
Consarc	USA	Nuclear	High-temperature ovens	NY Times 16/7/90
BNL (Banco Nazionale Lavoro)	USA	WT	Atlanta branch of italian owned bank, financing	Chicago Tribune 6/5/90
Centrifugal Casting	USA	WT	Machine-tools for gun barrels	ABC News, 20/8/90
Sitico	USA	WT	Iraqi financed fron for VUF AG	Mednews 2/4/90
Tektronix Inc.	USA	WT	Computer graphic terminal	Washington Post 3/5/89
Textronix	USA	WT	Computers for missile R&D	Mednews 3,12 (2/4/90)

The Poison Gas Connection

A Chronology of Horror Documented Use of Chemical Weapons Since 1915

- April 1915:** First appearance chemical weapons on the battlefield of Ypres, Belgium, where German troops take the allies by surprise when they open the valves on cylinders of chlorine gas.
- 1925:** Spain uses chemical weapons against the Moroccan independence movement led by Abdel Krim.
- [1925:** Signature of the Geneva Protocol outlawing the wartime use of chemical and bacteriological agents.]
- 1931:** During its invasion and occupation of Manchuria, Japan uses chemical weapons against civilians.
- October 1935:** Mussolini's troops storm Abassynia under the command of Marshall Di Bono, massacring civilian populations with WWI-vintage chemical weapons;
- 1939-41:** Euthenasia program for mentally ill and handicapped enacted by Nazi regime in Germany.
- 1942-45:** Millions of Jews and other victims of the Nazis were gassed in facilities designed and supplied by German companies.
- 1954:** Great Britain allegedly uses chemical weapons (probably limited to riot control agents) against Malayan nationalists.
- 1963-67:** The International Committee of the Red Cross accuses Egypt of using phosgene, mustard gas, and riot-control agents during its invention in the Yemen Civil War, and of gasing an ICRC medical convoy CW agents were deployed by Nasser's elite guard, as well as by the Egyptian Air Force. Egypt denied the charges.
- 1968-75:** The U.S. makes widespread use of Agent Orange and other defoliants in Vietnam, which the U.S. refuses to consider as chemical weapons covered by the Geneva Protocol.

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- 1976-83:** U.S. officials, including ACDA Director Adelman, accuse Vietnam of gassing Hmong tribesmen in Laos and Kampuchea. Adelman alleges that CW agents were used "almost on the scale of genocide."
- 1979:** Vietnam uses CW agents to repel the Chinese incursion into its northwestern provinces launched on February 17.
- 1980-83:** the U.S. accuses Soviet troops of using air-delivered chemical bombs against resistance fighters in Afghanistan, but fails to turn up concrete proof. A biochemist at Harvard, Matthew S. Meselson, counters that Soviet "yellow rain" is little more than bee excrement.
- February 1984:** Iraqi planes drop chemical bombs on Iranian troops storming across the international border at the Majnoon Islands, halting their advance. Proof of Iraqi chemical attacks is evaluated by teams of U.N. specialists dispatched to Iran in 1985, 1986, 1987, and 1988.
- 1985-88:** French nuns and other Western humanitarian missions in Tigré province, allege that government helicopters carrying Soviet advisors spray Ethiopian rebels with mustard gas.
- March 1988:** In the most recent documented use of chemical warfare agents in the Gulf war, Iraq uses mustard gas and tabun against the Kurdish village of Halabja. These attacks allegedly continue in June-July 1988, against Kurdish tribesmen in the north.
- June 1988:** Cuban chemical warfare experts, under the direction of Colonel Juan Avila Ramirey, direct CW attacks against the pro-Western UNITA rebels of Dr. Jonas Savimbi in Angola. Both mustard gas and neuro-toxic agents are found in blood and environment samples examined by the Gent Toxicology Laboratory in Belgium. Colonel Ramirey is the commander of the Cuban Academy for Chemical Warfare, and was appointed earlier this year as Chief of Chemical Warfare in Angola.

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