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DATE: DEC 2002



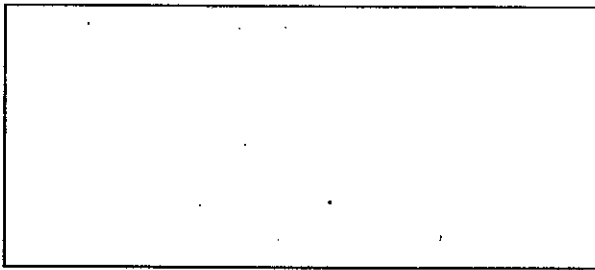
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CIA/SW 91-10047X

Prewar Status of Iraq's Weapons of Mass Destruction

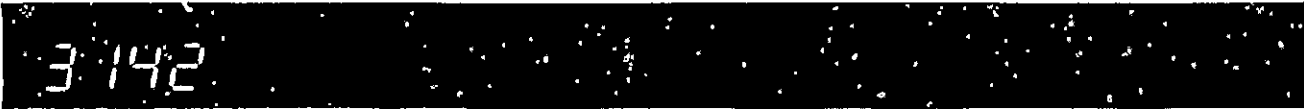


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Prewar Status of Iraq's Weapons of Mass Destruction [Redacted]

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This paper was compiled by [Redacted]
Office of Scientific and Weapons Research, from
papers published by [Redacted]
[Redacted] OSWR. Comments and
queries are welcome and may be directed to the
Chief, [Redacted] OSWR, on
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Prewar Status of Iraq's Weapons of Mass Destruction [Redacted]

Summary
Information available as of 15 January 1991 was used in this report.

As of 15 January 1991, Iraq's weapons of mass destruction posed serious threats to US forces and interests in the Persian Gulf. Iraq's use of chemical weapons and ballistic missiles in its war with Iran, its successful development of biological weapons, and its pursuit of nuclear weapons gave Baghdad capabilities unmatched in the Arab world. [Redacted]

Iraq apparently believes that it needs chemical weapons both as a deterrent and as a key support for its professed role as military "protector" of the Arab world. The high priority enjoyed by the chemical warfare (CW) program probably also reflects Iraq's satisfaction with the results of massive nerve agent strikes against Iranian forces in 1988 and subsequent CW use against Kurdish insurgents. [Redacted]

Iraq's CW program was by far the largest in the Third World. Iraq's combined production capability of the blister agent mustard and the nerve agents sarin and GF—the principal agents in its arsenal—was about 2,000 tons per year. Since the cease-fire with Iran, Iraq has stressed development of advanced CW agents. It is pursuing persistent nerve agents such as VX that are much more toxic than mustard, sarin, and GF. In addition, Iraq has developed binary chemical weapons with a longer shelf life, enabling it to maintain a sizable stockpile. In concert with developing a more sophisticated CW stockpile, the Iraqis are maintaining a wide range of battlefield-proven CW agent delivery options, including bombs, shells, and artillery rockets. We believe that Iraq also possesses CW agent warheads for its Scud and modified Scud ballistic missiles. [Redacted]

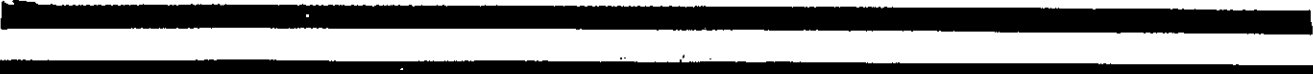
We have strong indications that Iraq is prepared to use chemical weapons in any conflict with US forces over Iraq's invasion of Kuwait. Iraq most likely would use the nerve agents sarin and GF—possibly in binary form—in artillery rockets and aerial bombs on the battlefield but might also use GF and mustard against rear-area targets, such as airfields. However, Iraqi willingness to initiate use of chemical weapons in any future conflict, despite President Saddam Husayn's pronouncements to the contrary, undoubtedly will be tempered if its opponents possess credible CW capabilities and appear willing to retaliate in kind. [Redacted]

Before the war began, Iraq's advanced biological warfare (BW) program was the most extensive in the Arab world. [Redacted]

[Redacted] The Iraqis probably have already deployed

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militarily significant numbers of biologically filled aerial bombs and artillery rockets. Iraq is probably developing BW agent warheads for its indigenously produced Scuds. We believe that Iraq will hold its biological weapons in reserve as an escalatory option. The Iraqis very likely are developing additional BW agents—probably infectious agents and additional toxins—[Redacted]

Iraq probably has the technical competence, when combined with clandestinely obtained foreign technology or assistance, to develop a nuclear weapon by the late 1990s using indigenously produced fissile material. Other worst case and much less likely scenarios exist in which Iraq could develop a nuclear explosive in as little as a few months after a decision to do so. These scenarios involve the use of a clandestine source of nuclear material—[Redacted] or the diversion and processing of safeguarded research reactor fuels into material suitable for a crash nuclear explosives program. [Redacted]

Even though Iraq probably could develop a nuclear device before the end of the decade if its nuclear infrastructure remained intact, fitting the device into a missile's warhead will not be a simple task. [Redacted]

[Redacted] Iraq could face two or more years' delay in fielding a nuclear weapon. [Redacted]

Iraq has the most advanced ballistic missile program in the Arab world. It has three operational missiles—the Soviet Scud B and two Iraqi-modified Scud Bs called the Al Husayn and the Al Abbas. The modified Scuds are capable of reaching key targets some 600 to 700 km away in Israel, Iran, and Saudi Arabia. [Redacted]

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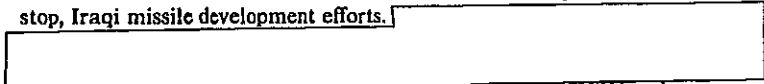
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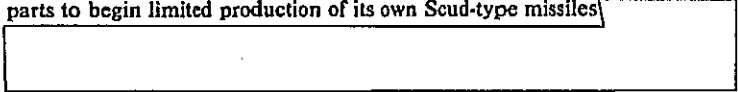
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International reactions to the invasion of Kuwait have helped slow, but not stop, Iraqi missile development efforts.



Despite the UN embargo, we believe that Iraq may already have received enough technology and parts to begin limited production of its own Scud-type missiles

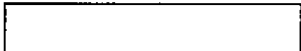
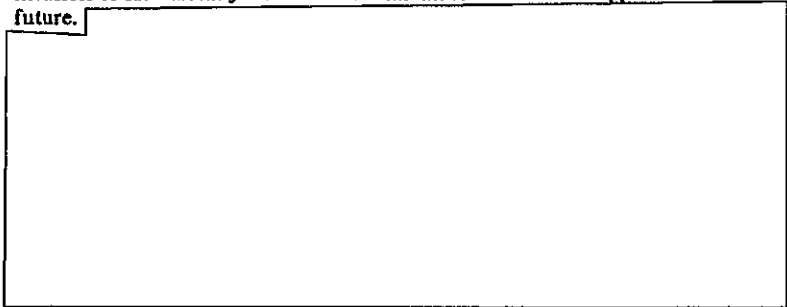


In our judgment, Iraq will develop and manufacture chemical and possibly biological warheads for all of its missile systems under development. Chemical and biological warheads are more cost effective, result in greater numbers of human casualties, provide a psychological edge, and make the missile a more effective deterrent.

We believe that current Iraqi missile projects will be difficult to stop, short of dismantling or destroying Iraq's missile production infrastructure.



The international pariah status gained by Iraq since the invasion of Kuwait may make it more difficult to obtain such support in the future.



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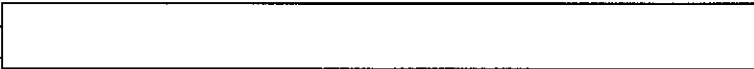
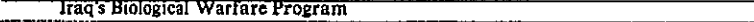

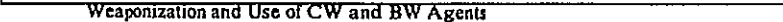

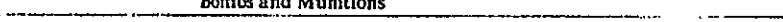

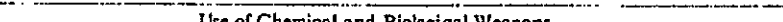
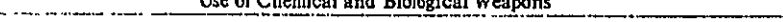









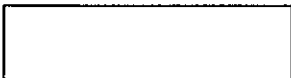
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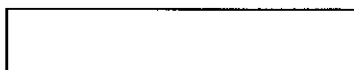


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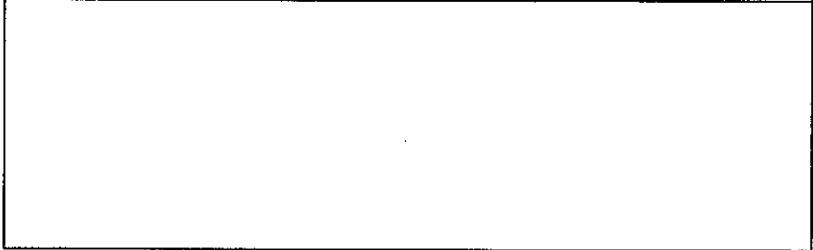
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Preface

This Reference Aid is a compendium of new information on Iraq's nuclear program and the following papers published by the Office of Scientific and Weapons Research and updated to 15 January 1991:



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He who launches an aggression against Iraq or the Arab nation will now find someone to repel him. If we can strike him with a stone, we will. With a missile, we will . . . and with all the missiles, bombs, and other means at our disposal.

Saddam Husayn
18 April 1990

Now, Iraq is in possession of the binary chemical weapon. According to our technical, scientific, and military calculations, this is sufficient deterrent to confront the Israeli nuclear weapon.

Saddam Husayn
1 July 1990

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Prewar Status of Iraq's Weapons of Mass Destruction [Redacted]

Iraq's Chemical Warfare Program

Background

Iraq's concerted chemical warfare (CW) effort during the Iran-Iraq war enabled it to establish a sizable and sophisticated infrastructure for R&D, production, testing, and storage of chemical weapons [Redacted]

[Redacted] By the war's end, Iraq was able to annually produce about 1,000 tons each of blister and nerve agents. Although Iraq had little difficulty obtaining the raw materials it needed to support such production, it began developing an indigenous precursor production capability after the United States and other Western nations began controlling sales of key precursor chemicals. [Redacted]

The 1988 cease-fire with Iran did not diminish the importance of Iraq's CW program, but it did significantly alter the program's focus. The demands of the war required that Iraq's CW program dedicate much of its resources to large-scale production of chemical weapons. Following the cease-fire, however, production of chemical weapons with a limited shelf life was no longer practical or even necessary, freeing Iraq to enhance its CW effort in preparation for future conflicts. [Redacted]

New CW Agents and Production Methods

Advanced Agents

On the basis of a variety of reporting, we believe that Iraq has been engaged in a sizable effort to develop and produce advanced CW agents. [Redacted]

[Redacted]

Iraq has already produced GF, a more persistent analog of sarin, and is seeking other analogs such as soman. We believe that the Iraqis produced and used some GF toward the end of the war with Iran and that binary GF now makes up part of Iraq's CW arsenal.

[Redacted]

Iraqi nerve agent research apparently has focused on VX as well [Redacted]

[Redacted]

[Redacted] Iraq also may be researching nonstandard nerve agents similar to VX. [Redacted]

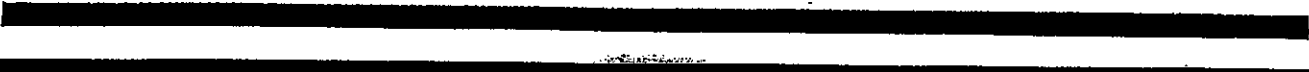
Improved Production Methods

Since the cease-fire with Iran, the Iraqis apparently have been optimizing their CW agent production processes and searching for new routes of manufacture. The goals of this effort probably are to simplify the production of CW agents, reduce bottlenecks in the process, and rely on indigenously produced or easily acquired raw materials. [Redacted]

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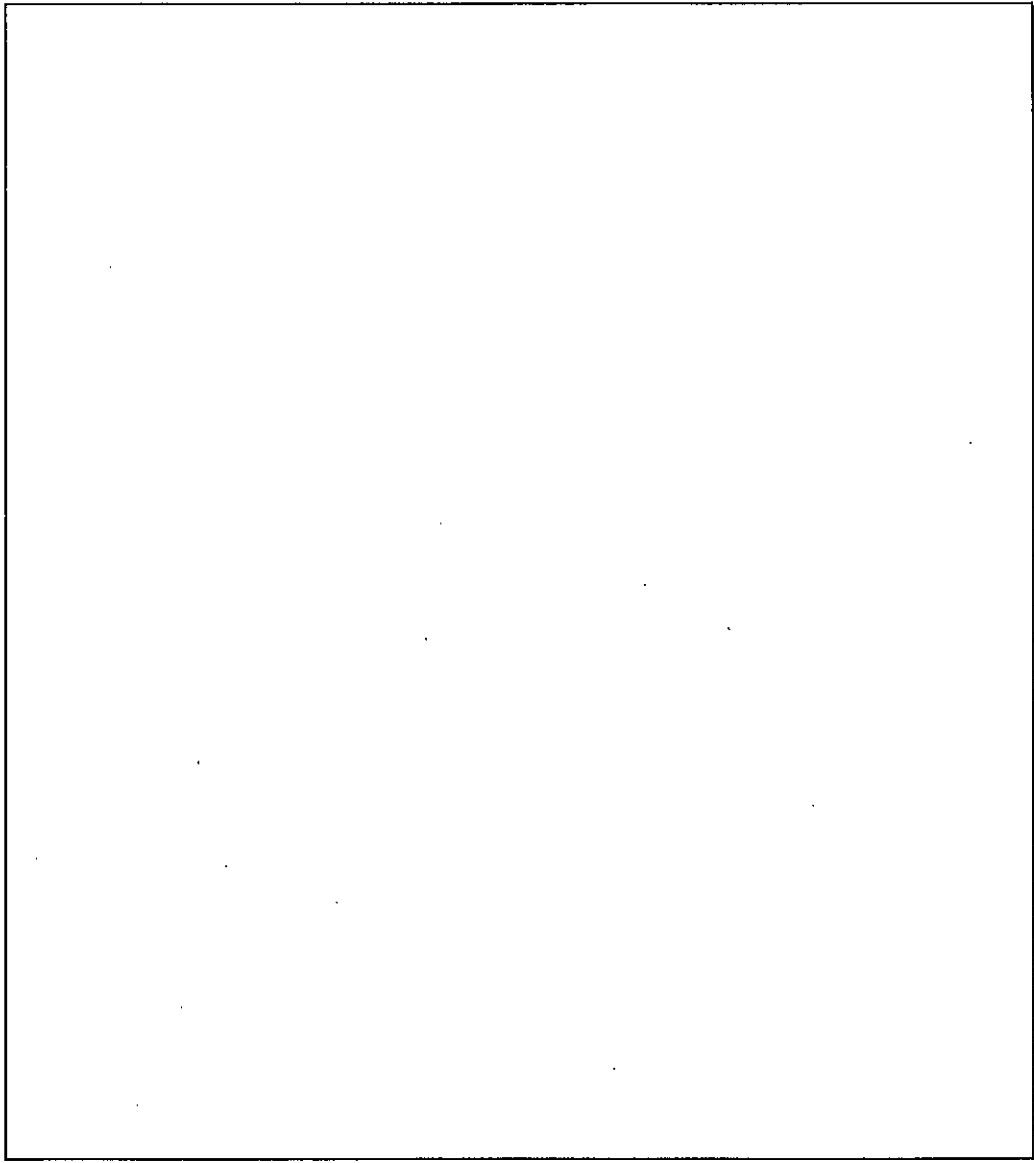
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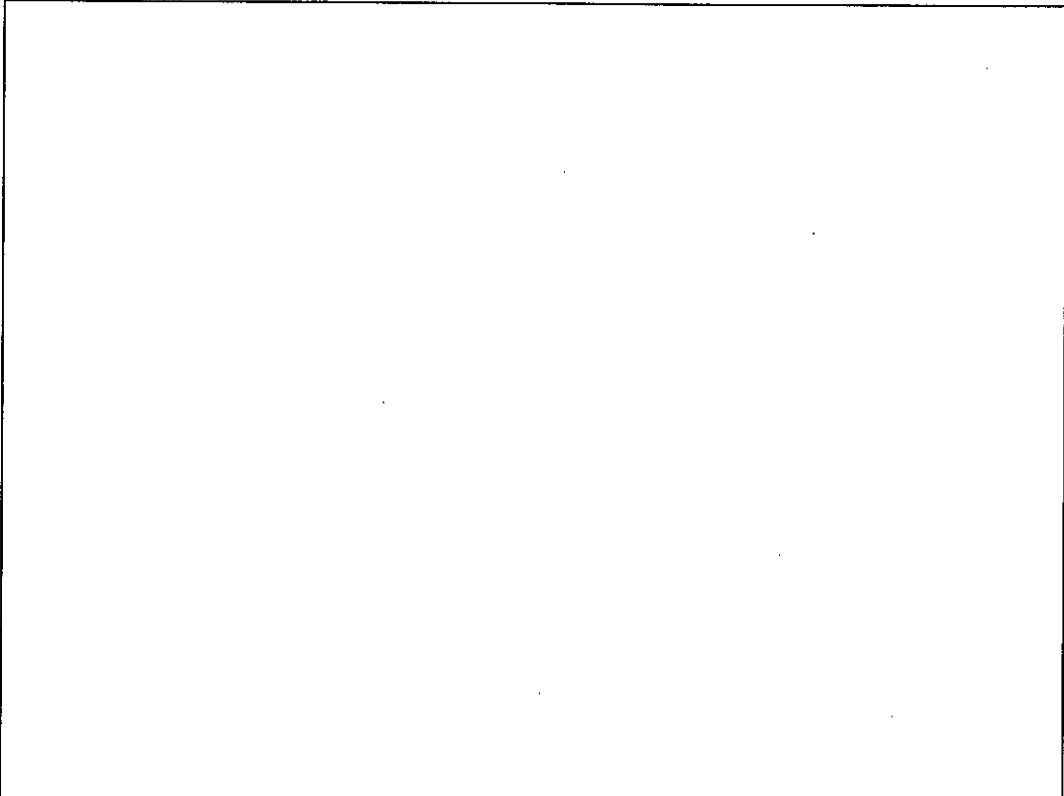


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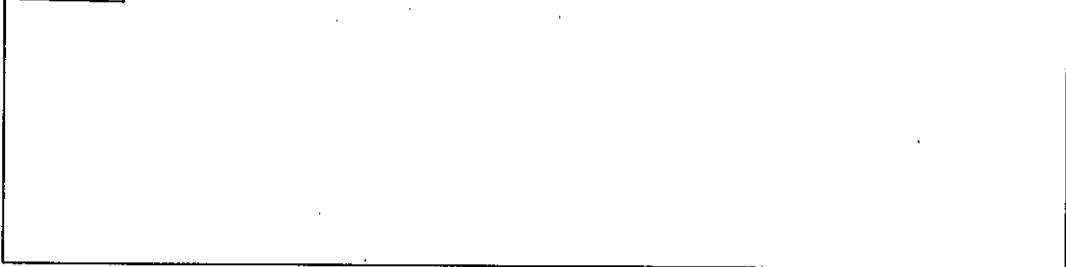




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Iraq gradually built up a CW protection capability during the Iran-Iraq war, primarily to minimize Iraqi casualties from inadvertent exposure to its own chemical attacks.



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war. In addition, we believe that the Iraqis were pleased with the minimal international response to its use of chemical weapons [Redacted]

Iraq has also trained its troops to operate in a chemical environment. [Redacted]

From a base of a well-established CW program, the development and production of biological weapons is the logical next step that a proliferating nation usually takes. Countries around the globe, including Iraq, have concluded that biological weapons offer much and require little:

[Redacted] several Iraqi courses related to CW defense, in addition to unspecified training that could be either offensive or protective in nature. [Redacted]

[Redacted]

[Redacted]

- Biological warfare (BW) agents can be produced with relatively small expenditures of time and resources.

[Redacted]

[Redacted]

[Redacted]

Iraq's Biological Warfare Program

BW Agents Under Development

Background

Iraq's expertise and experience with chemical weapons almost certainly have reinforced its desire to develop additional unconventional weapons. We believe that Iraq views its use of chemical weapons against Iran as a decisive factor in the outcome of the

A variety of information leads us to believe that Iraq has developed botulinum toxin and anthrax spores as BW agents. Botulinum toxin is nonpersistent, degrading rapidly in the environment. Anthrax spores are very stable in the environment and can be considered persistent BW agents. [Redacted]

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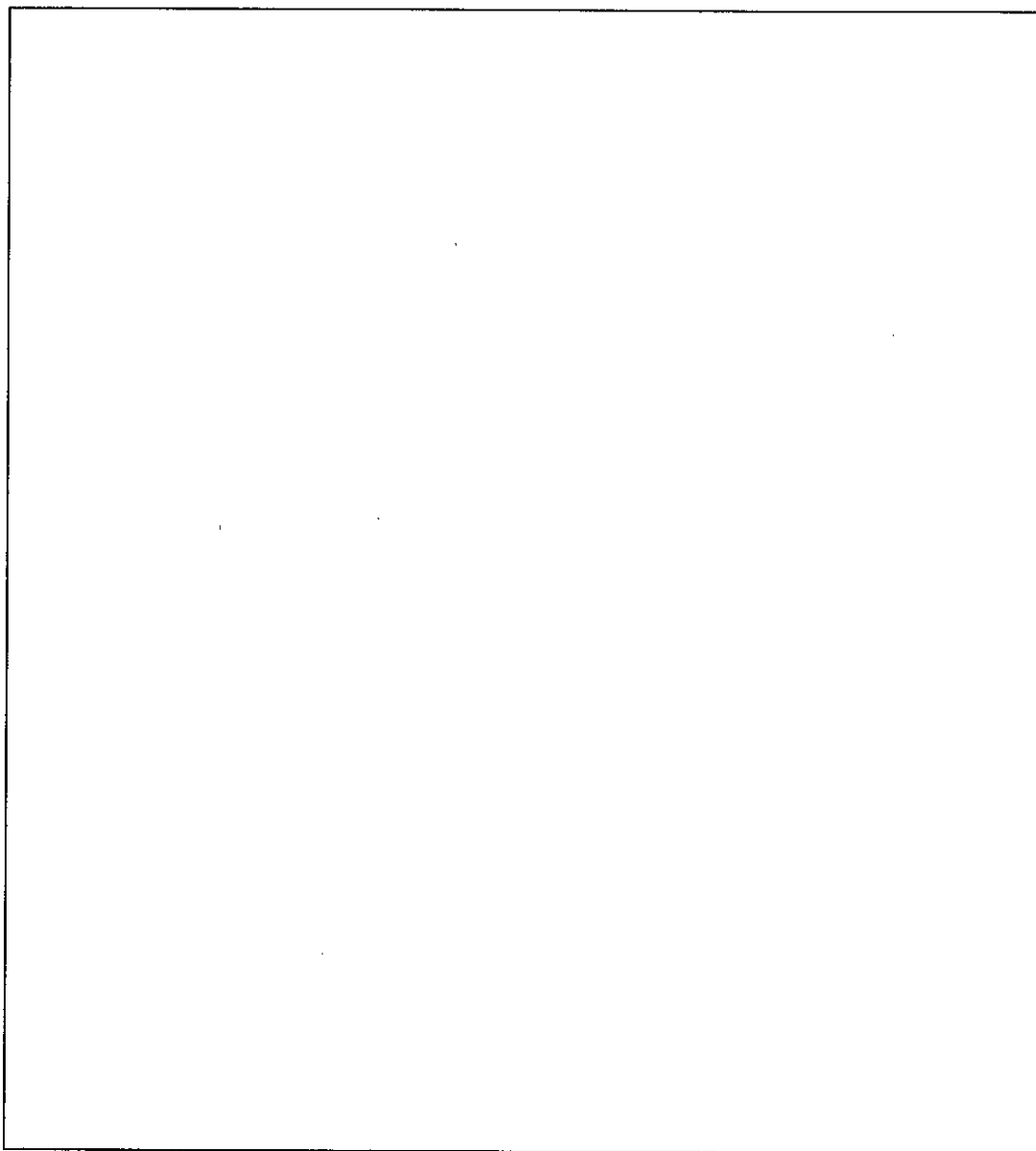
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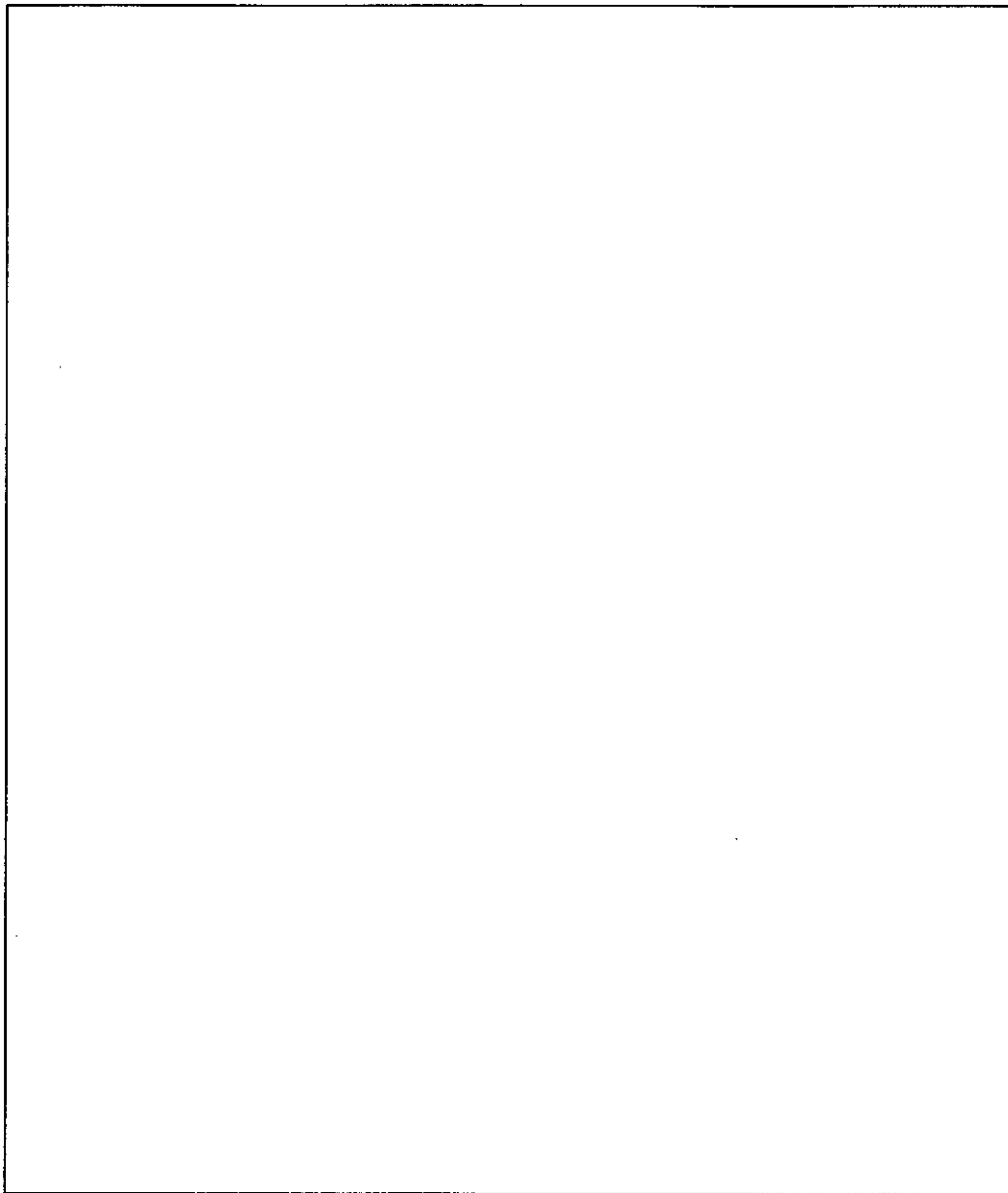


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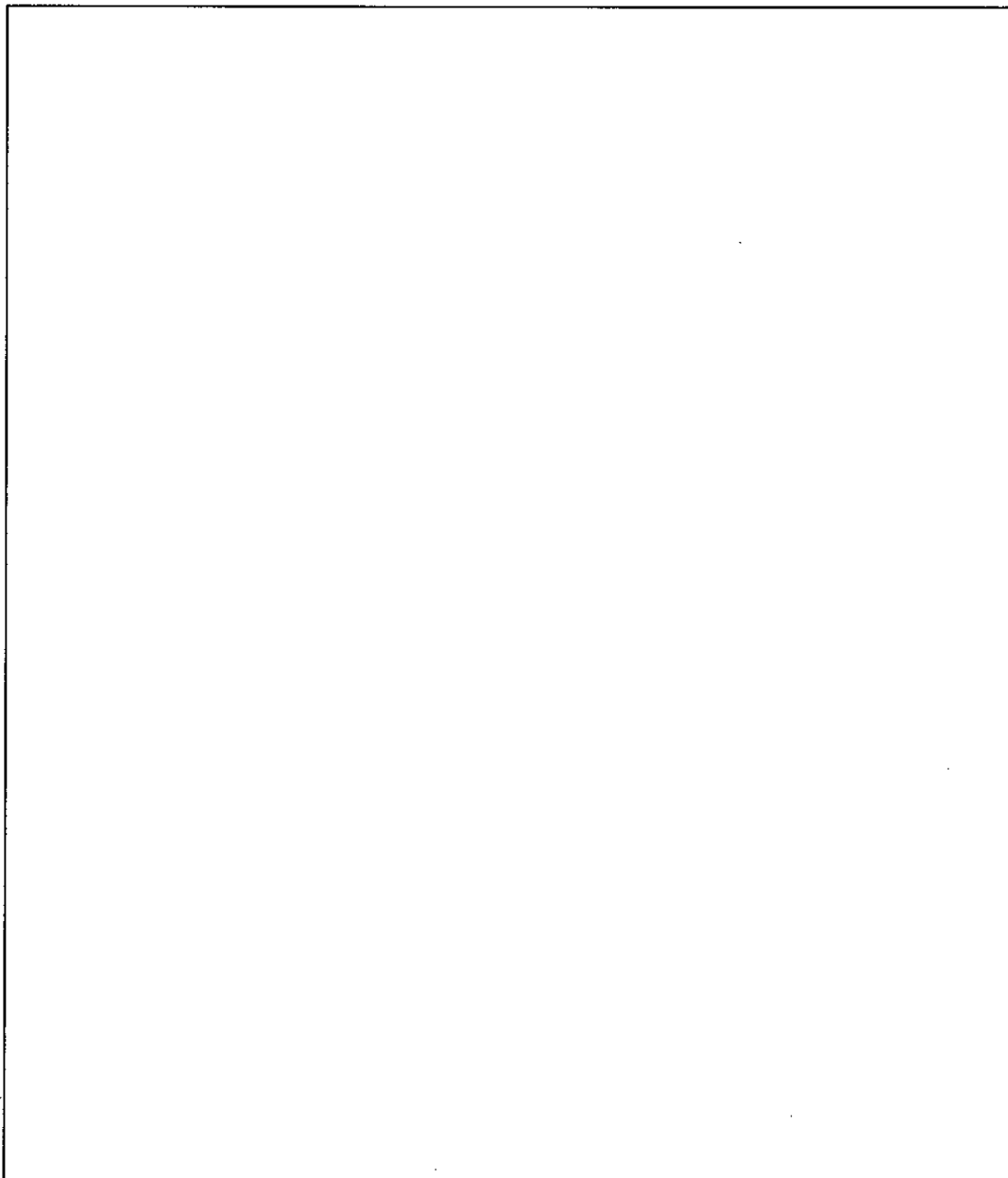
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Open literature indicates that Iraqi veterinary authorities signed a contract with an Italian firm in 1982 to construct a *Clostridium* vaccine plant near Baghdad.

[Redacted]

[Redacted]

Weaponization and Use of CW and BW Agents

Iraq has available a wide range of weapon systems that it could use to deliver CW and BW agents. The weapons range from simple aerial bombs and artillery rockets to ballistic missiles.

[Redacted]

Iraq also has chemical rounds for its 82-mm and 120-mm mortars and its 122-mm and 130-mm artillery. It also used 122-mm artillery rockets filled with CW agents, particularly in the final year of the war.

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All these munitions could also be filled with BW agents. [Redacted]

Bombs and Munitions

Iraq has historically purchased empty napalm or white phosphorus munitions that it has filled with CW agents and could fill with BW agents. [Redacted]

[Redacted]

[Redacted]

[Redacted]

We believe that Iraq has developed a chemical warhead for its Scuds and modified Scuds. [Redacted]

[Redacted]

Ballistic Missiles

Iraq is developing a long-range CW and BW delivery capability to augment its extensive short-range tactical capabilities. Of greatest concern is Iraq's development of chemical and biological warheads for its ballistic missiles. Iraq probably will develop and manufacture these warheads for each kind of ballistic missile under development [Redacted]

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[Redacted]

Iraq's Nuclear Program

Background

Notwithstanding Baghdad's Nuclear Non-Proliferation Treaty commitment, we believe that Iraqi President Saddam Husayn judges a nuclear weapons capability to be essential to meet perceived security needs and to further regional ambitions.

[Redacted]

Use of Chemical and Biological Weapons

Past Iraqi use of chemical weapons and statements by Iraqi officials justifying the use of any weapon to defend their country suggest that Iraq would use chemical and biological weapons in a conflict. In December 1990, Iraqi officials threatened to use chemical weapons against the multinational coalition forces if fighting broke out in the Persian Gulf.

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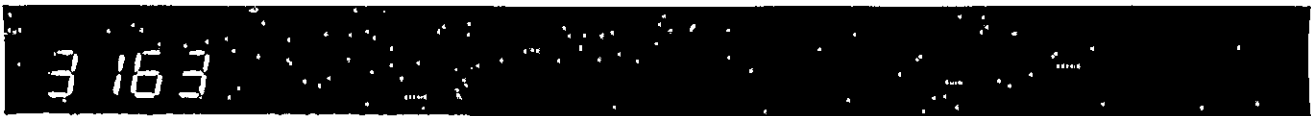
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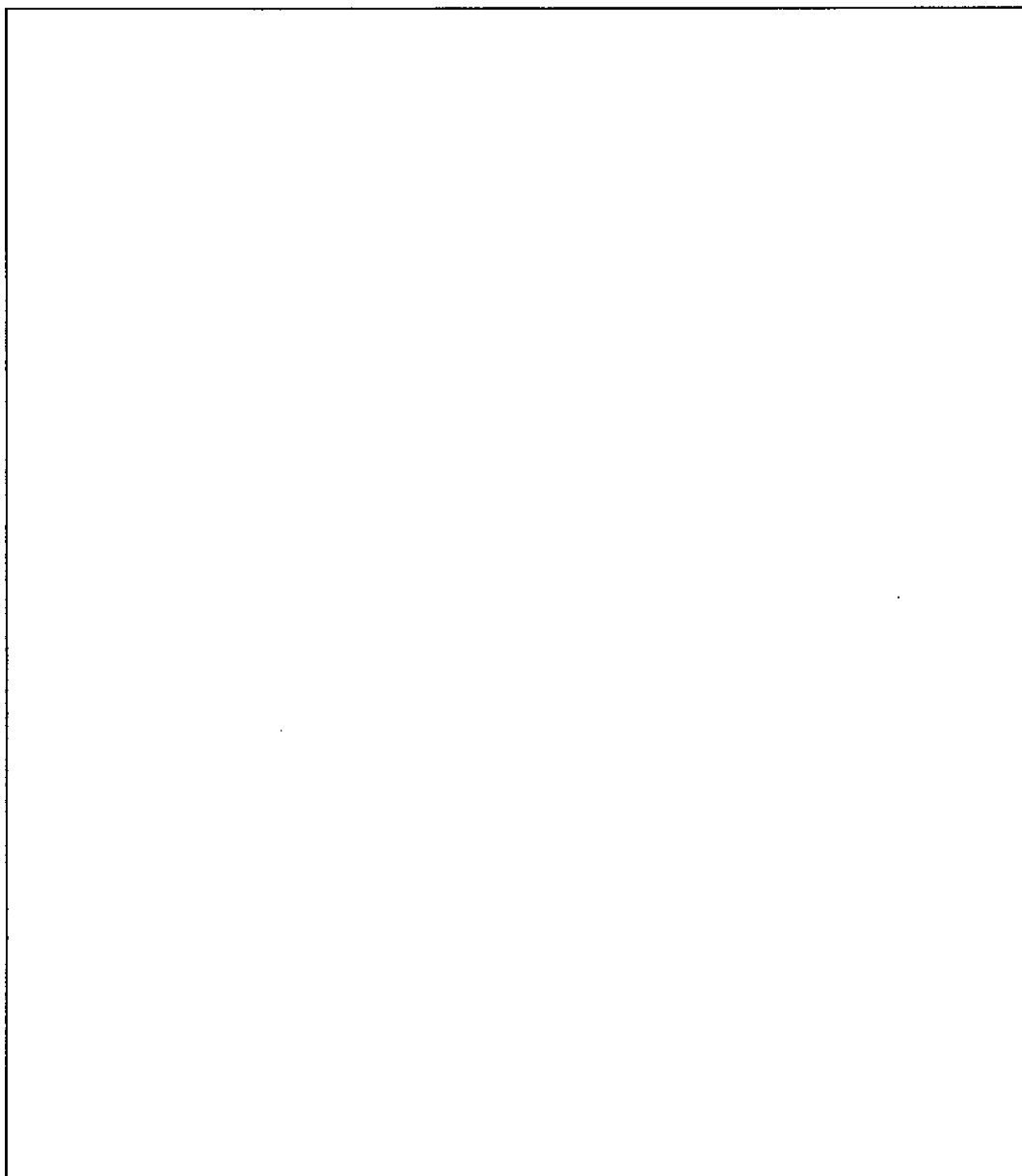
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[Redacted] Iraq has worked on nuclear weapons designs, [Redacted]

[Redacted]

However, even if a device design did not exist before the invasion of Kuwait, Iraq could greatly accelerate a design and development effort by compromising safety, reliability, efficiency, yield, compactness, and ruggedness. An expedited nuclear explosive design, of either the gun-assembled or implosion type, could be developed within six months to a year if no major obstacles were encountered.

[Redacted]

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[Redacted] our belief that Iraq has not yet completed a nuclear explosive design. [Redacted]

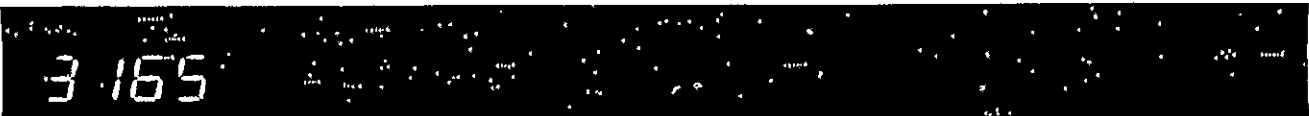
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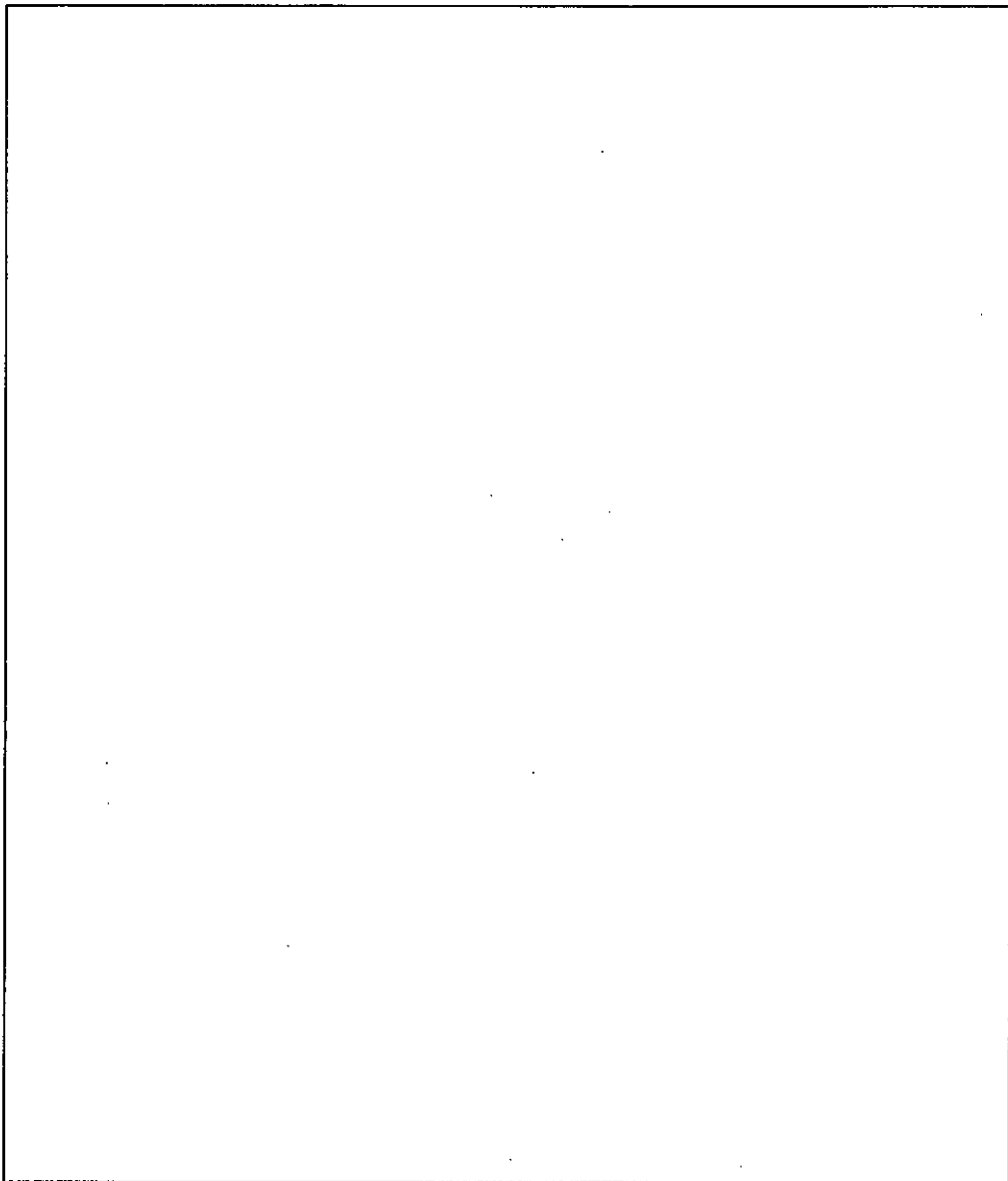
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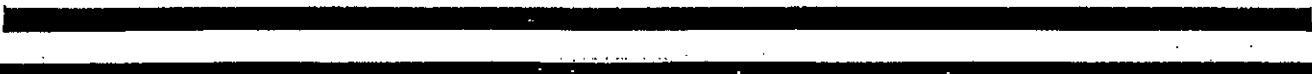




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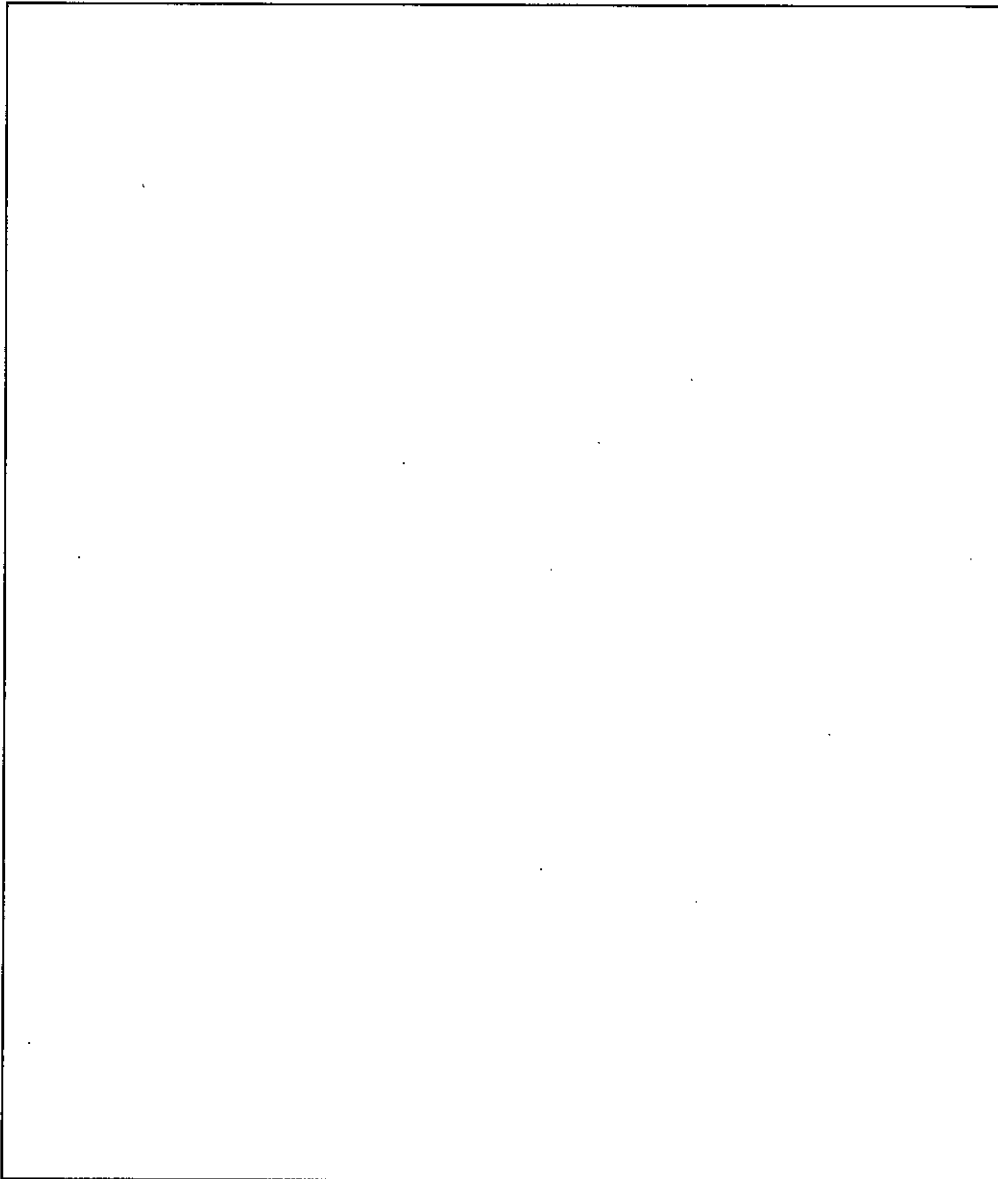


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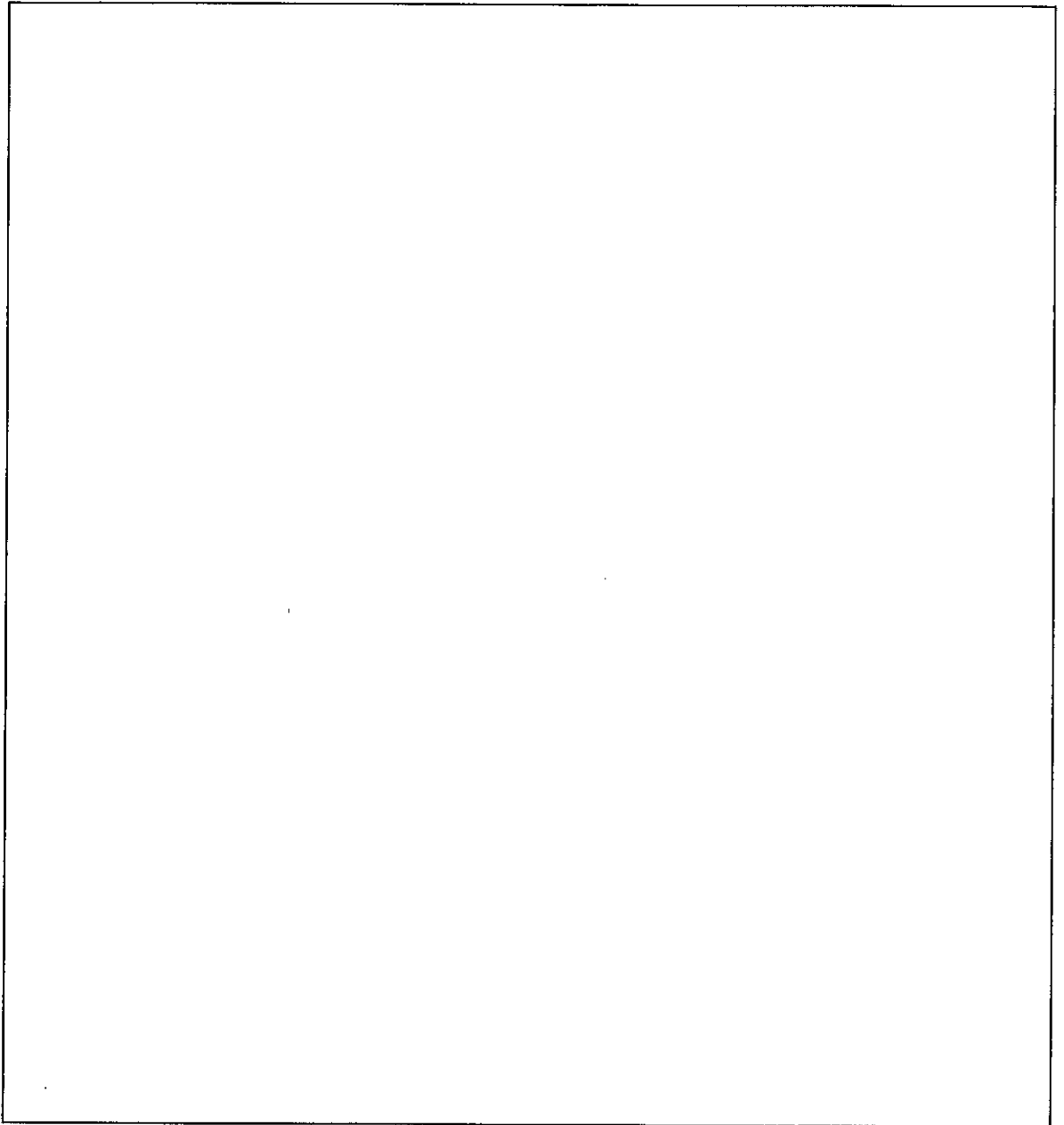
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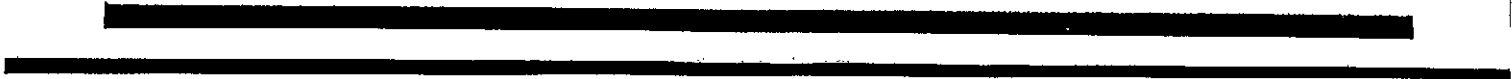
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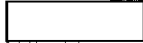


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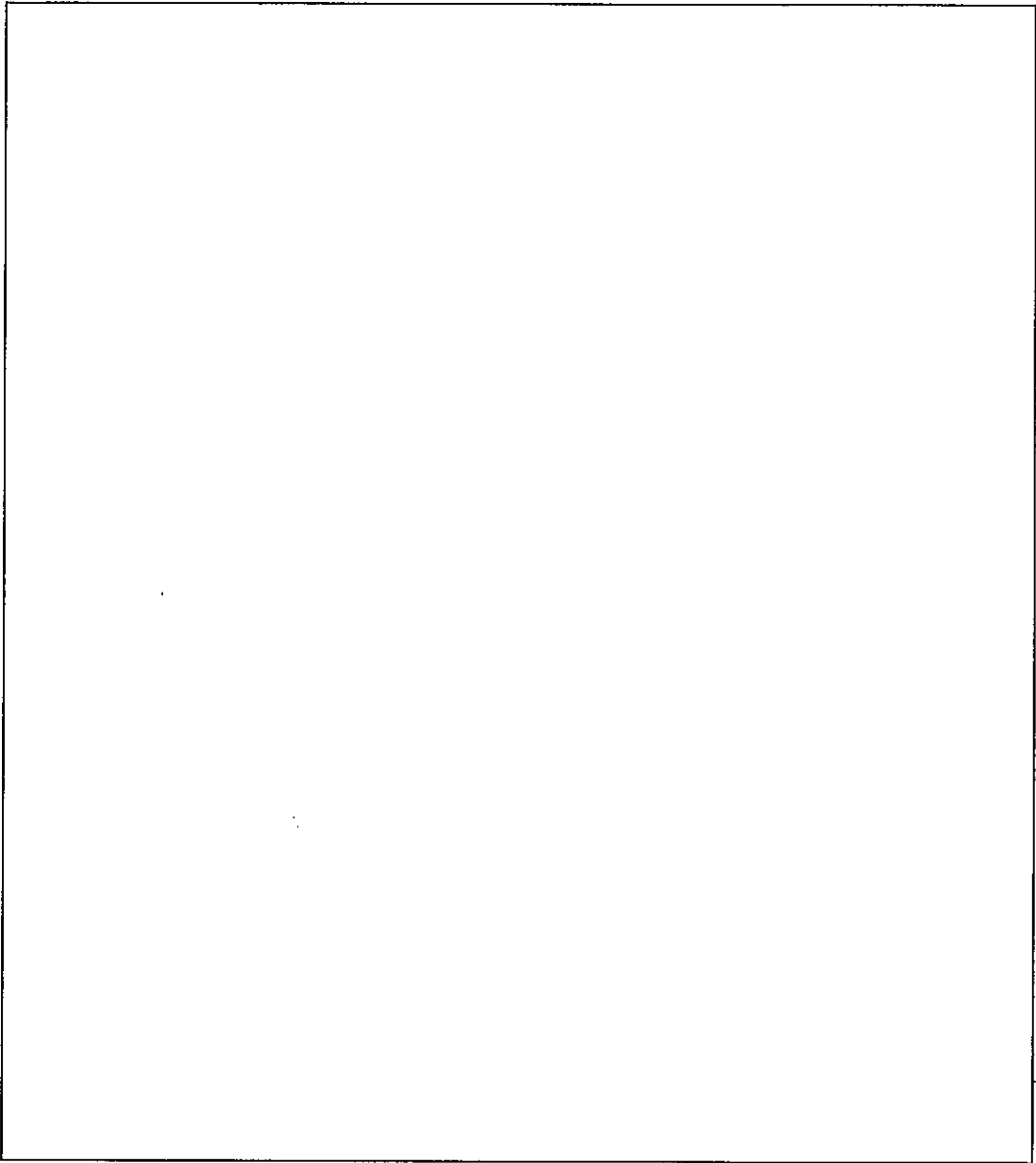


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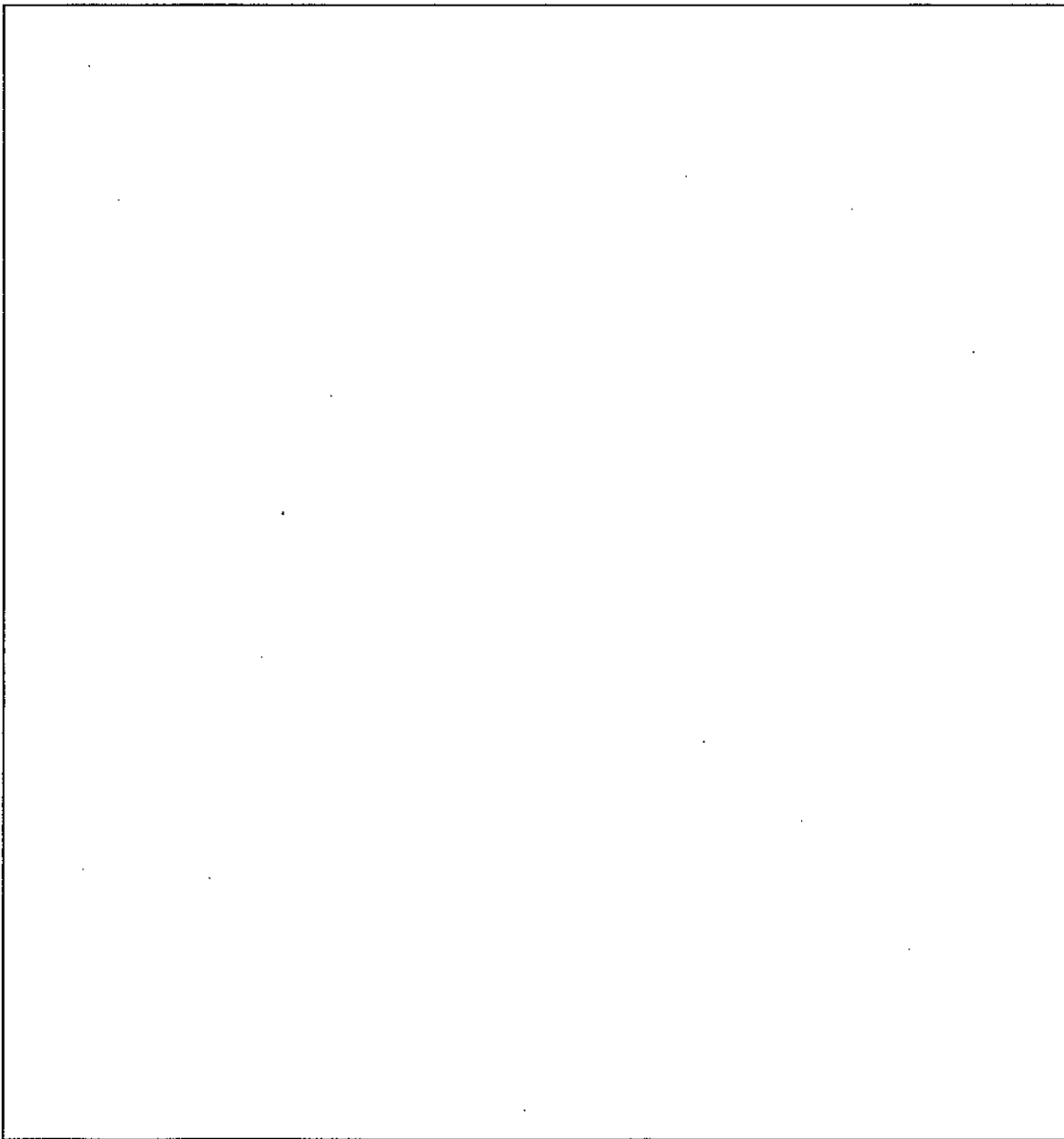
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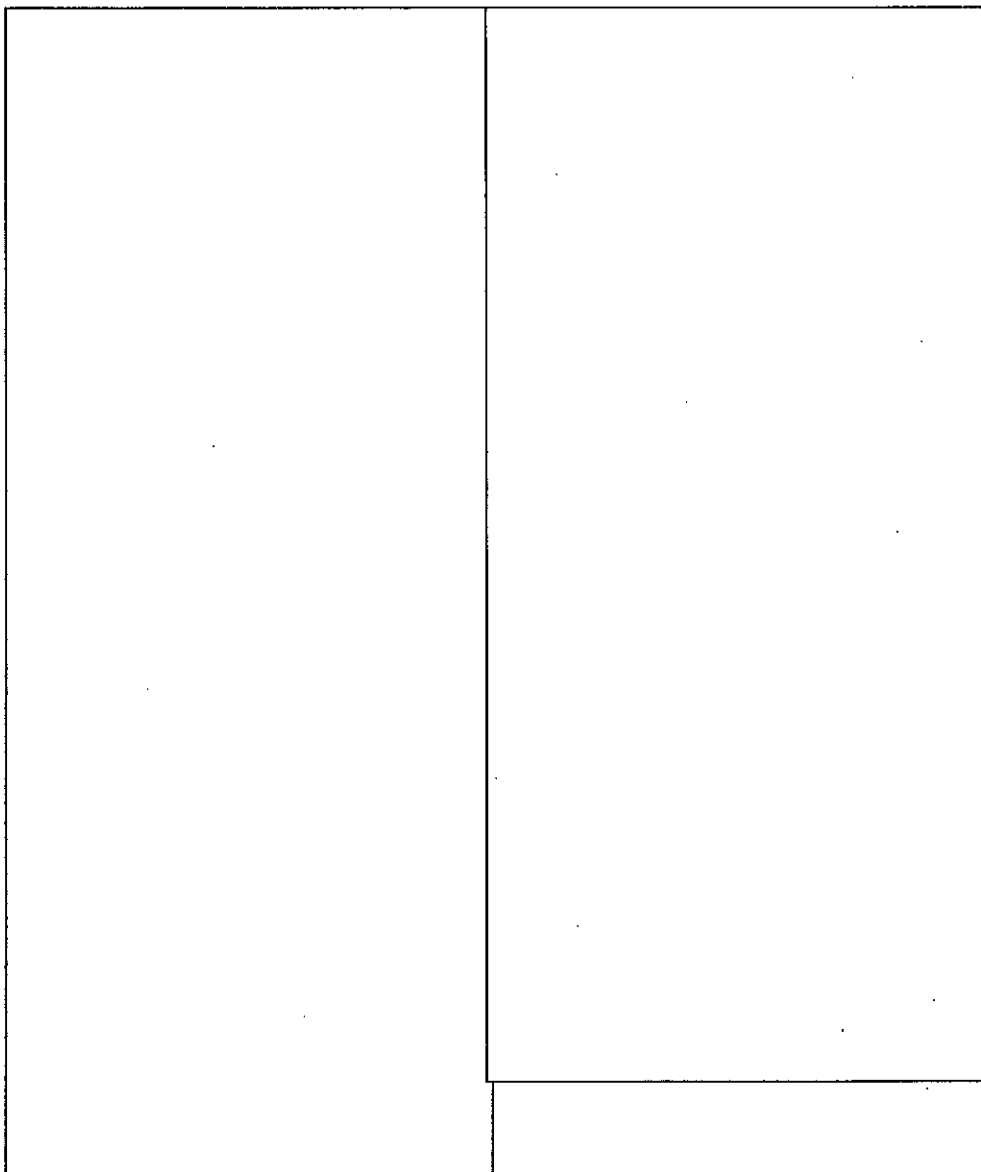
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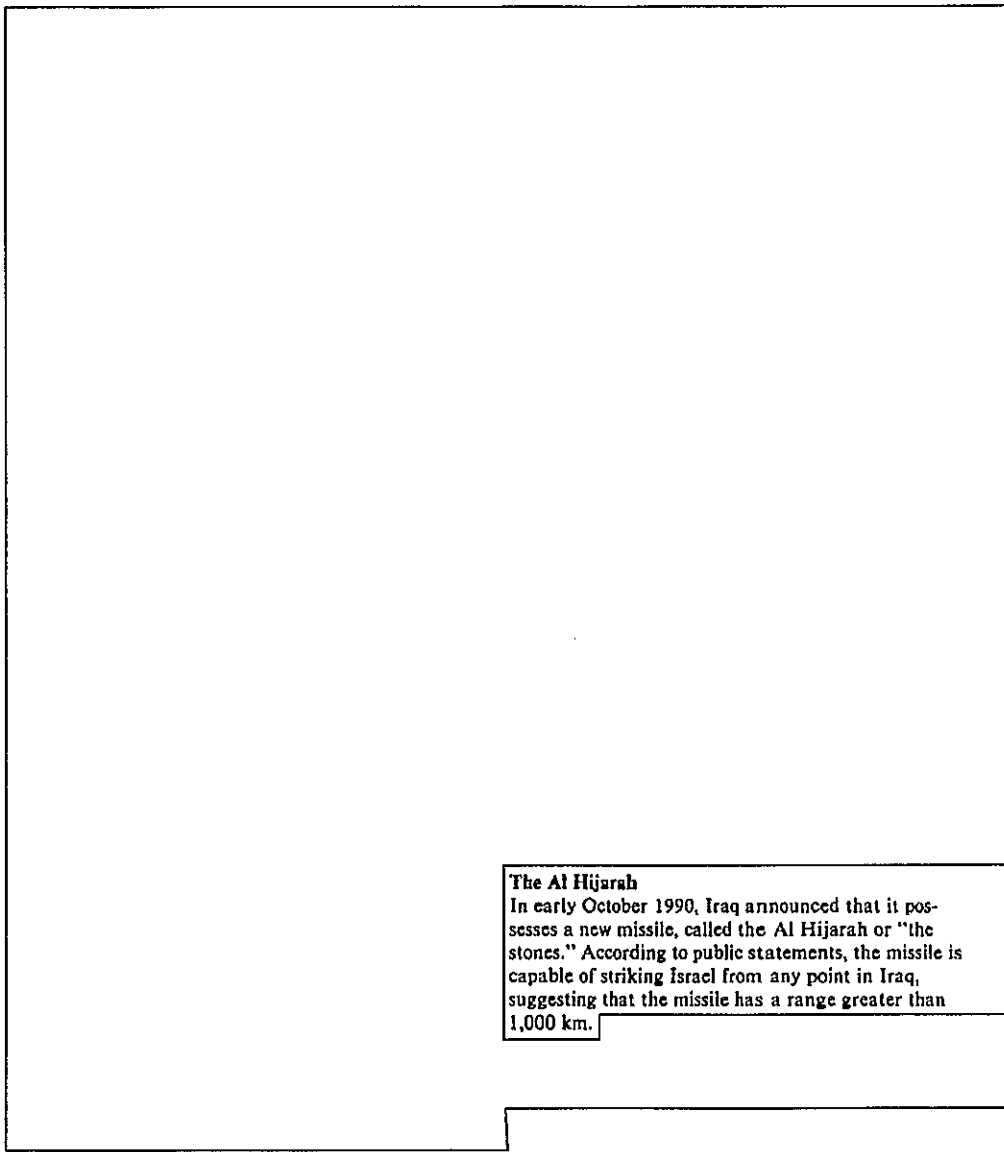
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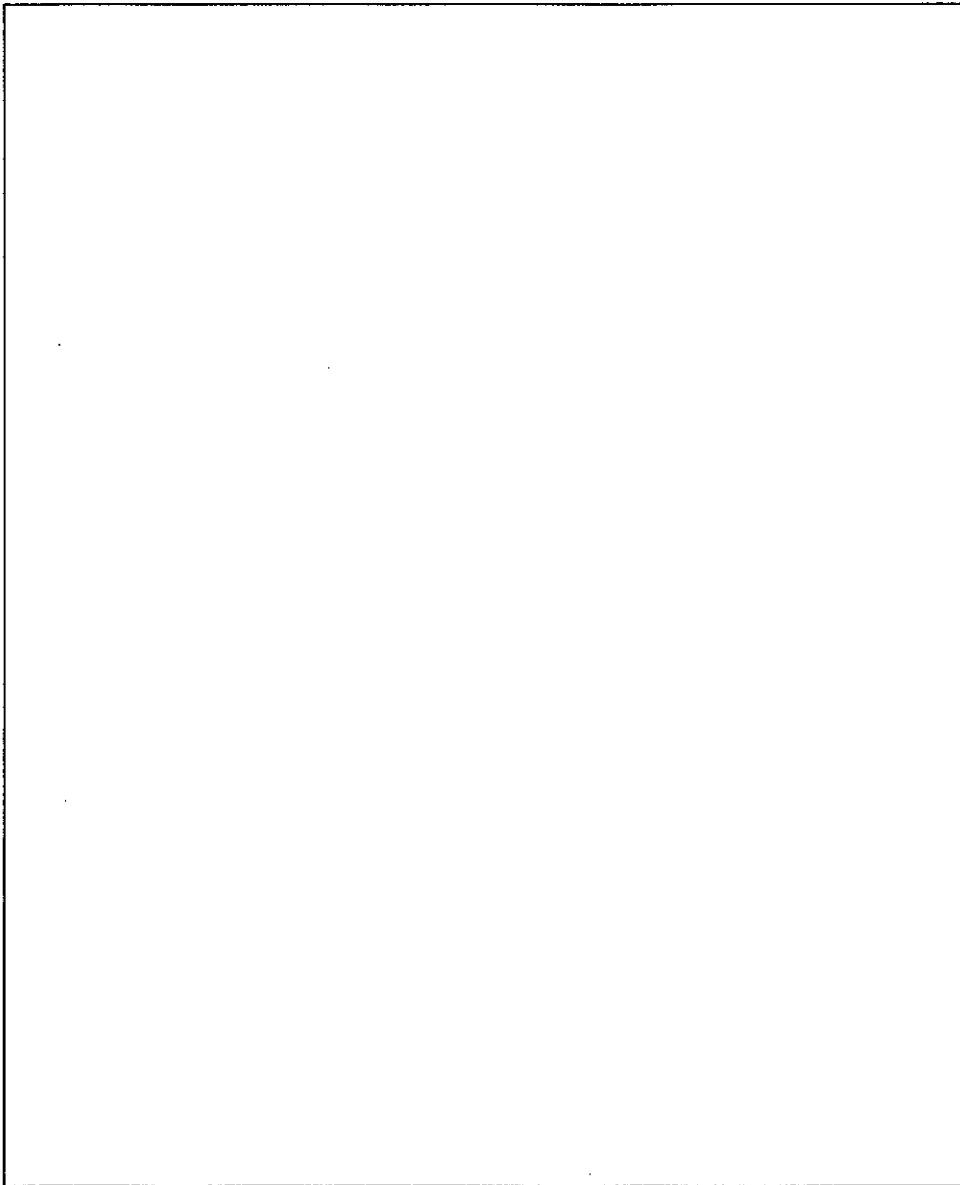
The Al Hijarah

In early October 1990, Iraq announced that it possesses a new missile, called the Al Hijarah or "the stones." According to public statements, the missile is capable of striking Israel from any point in Iraq, suggesting that the missile has a range greater than 1,000 km.

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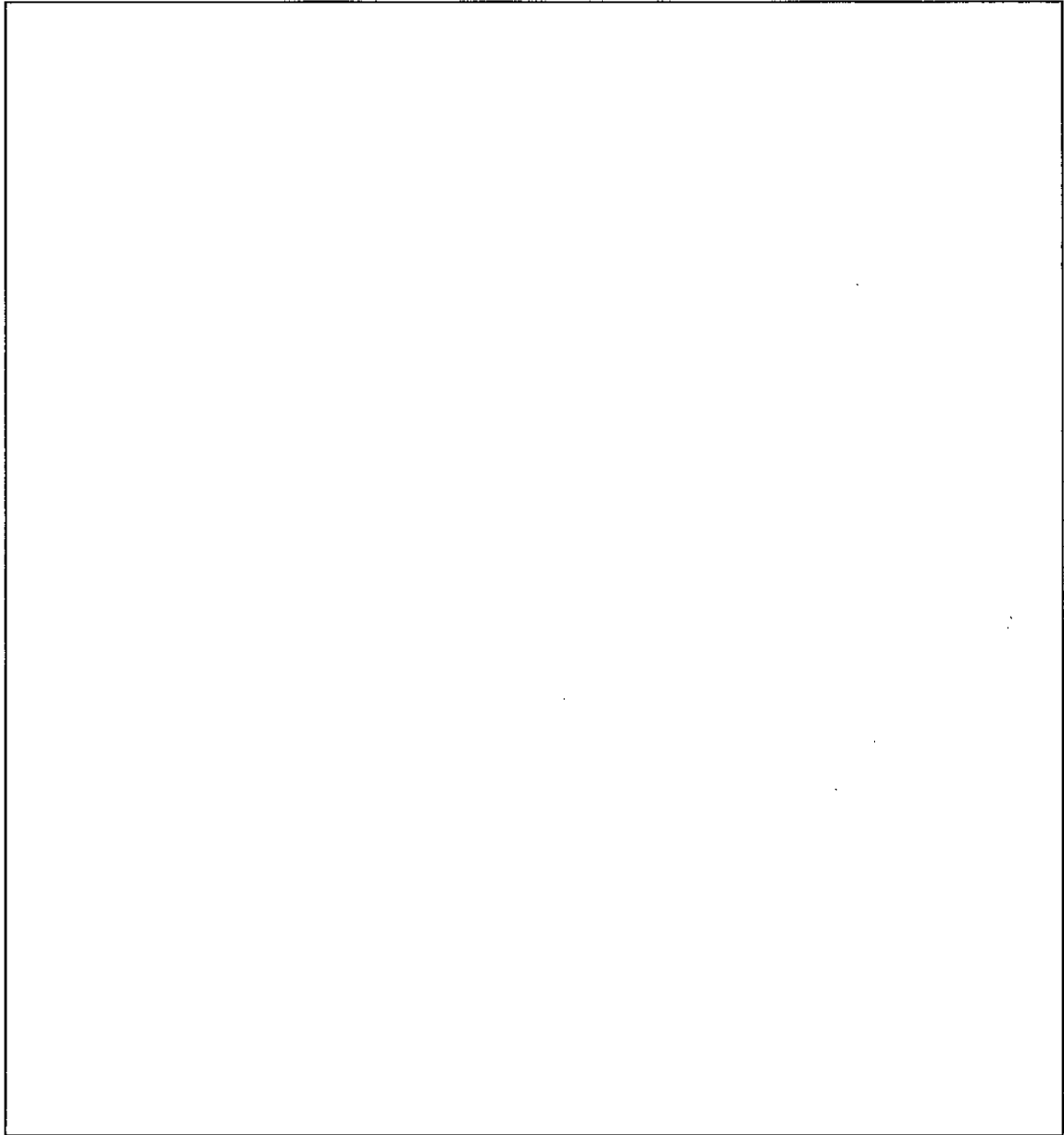


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Conclusions

Iraq will continue to give high priority to development of its weapons production facilities and delivery systems. We believe that Iraq seeks self-sufficiency in these programs to ensure immunity from supply disruptions like the embargo during the Iran-Iraq war and the current UN embargo.

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Chemical Weapons

We believe that tactical use of chemical weapons in support of conventional offensive and defensive operations has been incorporated into Iraqi military doctrine. Iraq utilized chemical weapons primarily during the last half of the Iran-Iraq war, which led to battlefield development of Iraq's CW doctrine. The decision to use chemicals during the war, however, was undoubtedly influenced by the lack of a significant Iranian countercapability. We believe Iraq will be less likely to initiate use of chemical weapons in future scenarios if its opponent is armed with a credible CW capability and appears willing to use it.

Of the many CW delivery systems available to Iraq, we believe that artillery rockets and aircraft-delivered bombs are the most likely to be used. We believe that Iraq has already produced a few chemical warheads for its Scud-type missiles, which would greatly increase its capability to strike Saudi population centers, airfields, and staging areas with CW agents.

We assess that Iraq's extensive CW capability poses a serious threat to US forces and interests in the Middle East. Iraq has the capability to deliver large amounts of CW agents on the battlefield and has shown a willingness to do so during the Iran-Iraq war. Recent reliable reporting indicates that, in an invasion of Saudi Arabia, Iraqi chemical weapons would be held in reserve and used immediately if Iraqi troops lose momentum. Targets for strategic CW use reportedly would be Dhahran and Riyadh, Saudi Arabia, with emphasis placed on airfields, staging areas, and civilian populations. The targeting of civilians is in line with Iraqi threats to "turn Kuwait into a graveyard" in case of foreign intervention.

Recent activity at Iraqi chemical weapons production and storage areas strongly suggests that Iraq's expeditionary forces have ready access to a fairly sizable CW stockpile.

[redacted] in 1988. [redacted] such activity usually indicated imminent use of CW because Iraqi nerve agents had a very limited shelf life. However, Iraq probably now has developed binary nerve agent weapons with a much longer shelf life. As a result, Iraqi forces probably now can maintain significant stocks of chemical weapons and use them at their convenience.

In our judgment, the CW agents Iraq is most likely to use in an incursion into Saudi Arabia are sarin (probably in binary munitions) and mustard. Sarin would be the agent of choice for targets that Iraq wants to occupy quickly—including oilfields and other key objectives—as well as for battlefield defenses. Mustard might be used to protect Iraqi flanks and, against key transportation nodes, to hinder movement and resupply of opposing forces. The semipersistent nerve agent GF could be used in place of sarin if the target need not be captured immediately. Agents less likely to be used—but still potential threats—include the persistent nerve agent VX, the nonpersistent nerve agent soman, nitrogen mustard, and perhaps even nonlethal tear gas and vomiting agents.

Biological Weapons

Saddam probably has little fear of the political consequences of using biological weapons. He has the dubious distinction of being the first to use nerve agents on the battlefield and successfully weathered the limited international response to this use.

We believe that Iraq had deployed a militarily significant number of bombs and artillery rockets filled with botulinum toxin and anthrax by the end of 1990.¹¹ In

¹¹ Because of the large area of coverage provided by biological weapons, even a few dozen would be militarily significant.

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[Redacted]

In addition, we believe that Iraq will soon develop a BW warhead for its indigenously produced Scuds [Redacted]

[Redacted]

We also believe that Iraq has been developing other BW agents that we have not yet identified. Likely candidates include viruses and additional bacteria and toxins [Redacted]

we cannot predict a time frame in which they would be ready for deployment. We cannot rule out the possibility that Iraq has already developed additional agents. [Redacted]

[Redacted]

[Redacted]

[Redacted]

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[Redacted]

