
Chemical Weapons and the Iran-Iraq War: A Case Study in Noncompliance

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The 1980-1988 Iran-Iraq War inflicted enormous human costs, as each side sustained hundreds of thousands of casualties.¹ In addition, the economic devastation wrought by the war was staggering. The damage to each nation's infrastructure, the billions of dollars in lost oil revenues, and the squandering of precious currency on the acquisition of massive arms purchases that sustained the eight-year war continue to affect both nations to this day.² One of the darker chapters of the war was Iraq's use of chemical weapons (CW) against Iran and Iran's decision to employ chemical weapons in response.

The use of CW by both sides created a number of dangerous precedents that continue to resonate. From a global perspective, the use of CW by Iraq and allegedly by Iran demonstrated that Third World weapons of mass destruction (WMD) proliferators could potentially generate significant tactical military and strategic political benefits from the use of such instruments in conflict.³ Given the international community's initial reluctance to condemn and punish Iraq for its chemical attacks, many Middle Eastern analysts speculate that Iranian se-

curity elites used the Iraqi CW experience as a prime motivator in developing Iran's WMD programs and improved conventional capabilities. From the Iraqi perspective, its use of CW most likely emboldened Saddam Hussein and key Iraqi military officials to continue developing Iraq's WMD programs and pursue aggressive regional security policies—a development that manifested itself during the 1990-91 Gulf War and continues to be of intense international concern.

While the Chemical Weapons Convention (CWC) was still being negotiated during the mid-1980s, the 1925 Geneva Protocol stood as the controlling international legal document on the use of CW in war. Despite the existence of the Protocol and the long-standing norm it established against CW use in war, the repeated use of such weapons by both combatants during the Iran-Iraq War fundamentally altered the debate about CW control and compliance. As a result of the use of CW, the issue of compliance ceased to revolve solely around the centrality of the Cold War standoff between the Soviet Union and United States. The Iran-Iraq War demonstrated the changing nature of armed conflict towards

the end of the Cold War, as it appeared that the prospects had diminished greatly for a total war between the North Atlantic Treaty Organization and the Warsaw Pact. This new type of conflict forced the international community toward making critical decisions about whether to punish violations of multilateral arms control regimes that were championed as lessening the prospects of war in the first place. The Iran-Iraq War demonstrated the potential problems these decisions could engender in the future, especially if both combatants are located in one region. In addition to the political difficulties that arose in detecting, responding to, and punishing instances of noncompliance, the use of CW in the Iran-Iraq War demonstrated the technical challenges in enforcing, monitoring, and verifying compliance when both combatants were relatively closed societies.

This article explores the use of CW during the Iran-Iraq War and assesses the impact of that use on the issue of arms control compliance. It first describes the legal regime that existed against the use of CW. Next, it examines the strategic environment that existed prior to the Iran-Iraq War and sets forth the motivations, policies, and developments that drove Iraq to forge ahead with its CW program. It then chronicles the use of CW by Iraq during the conflict, and assesses the reactions of Iran, Iraq, and the international community to numerous allegations of CW use by both combatants. Lastly, this article concludes by assessing the lessons learned during the Iran-Iraq War and the impact the war had on the future of arms control and compliance.

THE LEGAL FRAMEWORK AGAINST CHEMICAL WEAPONS

World War I included the most extensive use of CW in the twentieth century. Virtually every major power during that war either possessed significant chemical stockpiles, or actually employed them at various stages of combat. As a result of this widespread use, there were over one million chemical warfare-related casualties during the war.⁴ While the vast majority of these casualties did not result in fatalities, the sheer numbers indicated the prevalence, widespread use, and impact of chemical agents. Following the war, momentum gathered in the international community to create a legal mechanism to address the troubling issue of CW and to a lesser extent, biological weapons (BW). Sensing an opportunity to tackle the problem after the war, the ma-

major powers, led by the United States in 1922 convened in Europe to discuss the issue. By 1925, a protocol was signed in Geneva that prohibited the use of chemical and "bacteriological" weapons in war. Signed on June 17, 1925, the Geneva Protocol "For the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases, and of Bacteriological Methods of Warfare" became the international legal mechanism that experts believed would create a stringent norm against the use of both CW and BW. The Protocol was actually rather short in length. It reads:

The Undersigned Plenipotentiaries, in the name of their respective Governments:

Whereas the use in war of asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices, has been justly condemned by the general opinion of the civilized world; and

Whereas the prohibition of such use has been declared in Treaties to which the majority of Powers of the World are Parties; and

To the end that this prohibition shall be universally accepted as part of International Law, binding alike the conscience and the practice of nations;

Declare:

That the High Contracting Parties, so far as they are not already Parties to Treaties prohibiting such use, accept this prohibition, agree to extend this prohibition to the use of bacteriological methods of warfare and agree to be bound as between themselves to the terms of this declaration....⁵

Essentially, the Geneva Protocol established the norm against the *use* of CW in armed conflict. However, the Protocol's language was silent on the issue of research, production, development, storage, testing, and stockpiling. It was this enormous loophole that nations interested in both CW and BW used to further such programs after the 1920s. In addition, the Protocol did not address the issue of monitoring, verifying, or enforcing instances of noncompliance even with respect to the future use of chemical or biological weapons. Also, a number of important reservations attached to the Protocol further weakened an already shaky legal regime. To this end, language was added that indicated that the Protocol's strictures would "...cease to be binding in regard to any

enemy State whose armed forces or allies do not observe provisions.” Additional language in the Protocol stipulated that its reservations would “...cease to be binding as regards use of chemical agents with respect to any enemy State whose armed forces or allies do not observe provisions.” These reservations have been interpreted by legal and arms control analysts as effectively reducing the Protocol to a “no-first use” treaty,⁶ so that prior to the CWC retaliatory use was in fact permitted under a broad interpretation of the Protocol.

The Protocol was open for signature in June 1925 and entered into force in February 1928. In the United States, ratification of the Protocol by the Senate faced strong opposition for almost 20 years, and President Truman withdrew it from Senate consideration after the end of World War II. During the Korean War, both North Korea and China accused the United States of using BW and thereby alleged U.S. violation of the Protocol. During the war in Vietnam, many Communist nations charged that the U.S. use of herbicides also violated the Protocol, but the United States argued that the Protocol’s limitations did not extend to the use of nontoxic gases (such as riot-control agents like tear gas) or herbicidal agents.⁷ After a lengthy struggle in the Senate over the issue of riot control agents and herbicides, the United States ratified the Protocol in April 1975. Iran ratified the Protocol in July 1929, while Iraq ratified in September 1931.⁸

The 1925 Geneva Protocol stood as the controlling legal authority on CW prior to the Iran-Iraq War. While the 1975 Biological Weapons Convention (BWC) existed and its language banning the use, research, development, production, and stockpiling of biological weapons was indeed impressive, it did not address the issue of chemicals outside of toxins, which are inorganic poisonous compounds produced by living organisms.⁹ Discussions on the CWC did not reach a critical point until mid-way in the Iran-Iraq War, when the issue of Iraq’s use of CW had gained enough international attention to warrant concern regarding the use of chemicals in that conflict and the proliferation of CW in general. In March 1984, less than a month after the first U.S. denunciations of Iraq’s use of CW, President Ronald Reagan dispatched Vice-President George Bush to the Conference on Disarmament (CD) at the United Nations to begin formal discussions on shaping a treaty outlawing CW.¹⁰ However, the CWC was only open for signature (January 1993), well after the end of the Iran-

Iraq War. The CWC entered into force in April 1997, almost 10 years after the Iran-Iraq War ended.

On the eve of the Iran-Iraq War, the 1925 Geneva Protocol stood as the controlling legal authority on the issue of chemical weapons. The Protocol’s language did not ban the research, production, stockpiling, weaponization, or even retaliatory use of CW. In addition, the treaty did not contain an enforcement mechanism that allowed its transgressions to be punished appropriately by the international community. It appears that the Protocol’s norm against use was not by itself sufficient to prevent Iraq’s use of CW. While it is difficult to discern precise motivations for Iraq’s strategic decisions during the rule of Saddam Hussein, the lack of a stringent legal authority against the production, development, stockpiling, and use of CW might have shaped Iraq’s decision to use CW during the Iran-Iraq War.¹¹

At this point, a number of important policy questions can be raised and considered with respect to the issue of CW in the Iran-Iraq War. Would Iraq have used CW against Iran if a more comprehensive CW arms control regime existed? Also, even if such a regime had existed, would the international community have vigorously enforced it? Lastly, how does this particular instance of noncompliance relate to other cases?

THE STRATEGIC ENVIRONMENT PRIOR TO THE IRAN-IRAQ WAR

Much has been written regarding Iraq’s historic and contemporary role in Middle East affairs. Detailed analyses outlining the rise of Saddam Hussein and Iraq’s turbulent political trajectory under his leadership indicate that by the early 1970s, Saddam was eager to position Iraq as the dominant regional Arab military and political power in the Gulf, if not the entire Middle East.¹² An influx of cash from the rise in oil prices during the early 1970s fueled Saddam’s personal ambitions to transform Iraq into the dominant Arab military power and Iraq began to explore every aspect of WMD proliferation. Iraq began nuclear, chemical, biological, and ballistic missile programs during the mid-1970s, and all of these WMD activities gained momentum in 1974. Iraq considered a CW program during the late 1960s, and by 1974, decided to begin CW activities.¹³

By mid-1980, as Iraq rose to regional power, Iran fell into disarray just 18 months after the flight of the Shah.

Shortly after the beginning of the Iranian Revolution (February 1979), the Iranian armed forces lost most senior military officers to desertion, confinement, or execution, while thousands of other lower-ranking military personnel deserted.¹⁴ After the occupation of the U.S. embassy by radical students in the fall of 1979, Iran lost the support of its major political and military sponsor, and Iran's once impressive and sophisticated military machine began to fall into disrepair due to the lack of maintenance and spare parts previously supplied by the United States and other Western countries. Saddam and senior Iraqi decisionmakers most likely calculated that, in light of Iran's weakened armed forces and the intense jockeying for political power in Iran between moderates, Leftists, and Islamists, the time was ripe to reverse some of Iraq's political losses. In particular, Saddam was keen on abrogating the 1975 Algiers Accord between the two nations, in which Iran was granted control of the strategic Shatt al-Arab waterway in return for Iran's pledge to cease its support of anti-Iraqi Kurdish guerrillas.¹⁵ Iraq also may have feared Iranian-inspired Shia fundamentalism spilling over into Iraq and spreading further throughout the region. In addition, Iraq may have hoped for the possible annexation of Khuzestan, an oil-rich and largely Arab province in southwestern Iran.

While Iraq's precise motivations¹⁶ for invading Iran have not yet been officially revealed by Iraqi leaders, on September 17, 1980, Saddam announced that he was abrogating the 1975 Algiers accord. Five days later, Iraq launched a massive offensive, and tens of thousands of Iraqi troops began pouring into Iran.¹⁷

EARLY DEVELOPMENTS IN THE GULF WAR

During September and October 1980, Iraqi forces made significant thrusts into Iran, and the momentum of the conflict swung in Iraq's favor. Despite suffering from a three-to-one disparity in population (Iran's population stood at 45 million, while Iraq's pre-war population numbered around 15 million), Iraqi forces were better trained, equipped, and motivated.

The speed and initial success of Iraq's initial thrusts into Iran led many observers to speculate that Iraq's war aims would be reached within a matter of weeks, if not months. However, Iraq seemed content with capturing the strategic Iranian oil-producing targets of Khorramshar and Abadan, and the Iraqi offensive halted. Saddam began exploring avenues for negotiating a settle-

ment from a position of strength with the new Islamic government in Tehran. The decision to stop the Iraqi offensive so early in the war proved to be one of Saddam's major and fundamental miscalculations during the war.¹⁸

By January 1981, the nascent Islamic government in Tehran had rejected Iraq's overtures for a negotiated settlement, and the Iranian military began to strengthen against Iraqi offensives. During this time, Iranian forces also began to launch their own counteroffensives to recapture territory from the Iraqis. While both sides were absorbing significant casualties, battles were being fought along a fairly static front—probably no more than 40 or 50 kilometers east or west of the Iran-Iraq border. Because it had limited amounts of military equipment, which was either difficult to repair or purchase from the West, Iran began using "human wave" attacks composed of young Iranian combatants from the Baseeji (Popular Mobilization Army or People's Army). Hoping to capture the intense Islamic fervor that gripped Iran at the time, these young Iranians were promised martyrdom and eternal paradise for sacrificing their bodies against static Iraqi lines. With the use of these antiquated (i.e., vintage World War I) tactics, the Iranians began to turn the tide of the war, and by September 1981, had recaptured the vital oil-producing center at Abadan.¹⁹

In addition, by the fall of 1981, other events began to lead Iraq towards using CW in the conflict. On June 7, 1981, Israeli F-16 strike aircraft conducted a "surgical strike" that destroyed the Tammuz I (Osirak) nuclear reactor near Baghdad. The Israeli operation exposed Iraq's strategic vulnerabilities, not only because Israeli F-16s managed to accomplish their mission without being detected or sustaining losses, but also because the bombing significantly set back the Iraqi nuclear weapons program. Therefore, while the nuclear option might have been considered a viable military instrument during the war with Iran, the Osirak strike set back Iraq's nuclear weapons ambition by at least five years.²⁰ Given this development, Iraq may have begun to consider seriously the continued development and possible future use of CW in its war with Iran.

By the early 1980s, Iraq's chemical capabilities consisted of limited research and production of nerve and blister agents.²¹ Initially, Iraq was not able to produce indigenously most of its CW precursors, so it had to import those stocks from abroad.²² For example, Iraq

imported over 1,000 tons of thiodiglycol from Western Europe and the United States.²³ Also, Iraq's initial attempts to procure critical precursors for the production of nerve agents were frustrated due to Western export controls and interdiction efforts.²⁴ In addition to obtaining chemical agent precursors from overseas suppliers, according to Iraq's declarations provided to the United Nations Special Commission (UNSCOM—the U.N. body created after the Gulf War to oversee and implement the dismantlement of Iraq's WMD capabilities), during the 1980s it procured the majority of its CW production equipment from abroad. Some of those production facilities were “constructed, assembled, or completely furnished with equipment by foreign companies.”²⁵

Despite the difficulties in obtaining the necessary quantities of chemical agent precursors and the initial reliance on foreign chemical agent production equipment and technology, by the mid-1980s, Iraq's chemical program became increasingly self-sufficient. This dynamic enabled Iraq to increase production of chemical agents, and arguably served as a hedge against international pressure from foreign suppliers to scale back its use of chemical weapons against Iran. For example, by this time frame, Iraq had expanded its blister agent production capabilities due to its ability to indigenously produce large amounts of thiodiglycol and ethylene (the latter a byproduct from the production of petroleum or natural gas).²⁶ Ultimately, Iraq declared to UNSCOM that all CW agent production facilities were located at the Muthanna State Establishment (MSE), and that all agents were only produced there.²⁷ The agents included in this arsenal were mustard agent, sarin, tabun, and possibly small quantities of VX.²⁸

PATTERNS OF IRAQI USE AND THE INTERNATIONAL COMMUNITY'S RESPONSE

Developments from 1982 to 1984

From 1982 to 1984, the situation on the battlefield for Iraq was bleak, if not desperate. During this period, the conflict had settled into a war of attrition. While Iraq had proved adept at constructing defensive strong points and flooding lowland areas to hamper the advance of Iranian mechanized units, both sides showed little ability to utilize armor effectively. Rather than maneuver armor, both sides dug tanks in and used them more as field artillery pieces. Within a four-week period between

February and March 1984, the Iraqis reportedly killed 40,000 Iranians while losing 9,000 of their own troops.

On the political front, the Islamic government in Tehran had consolidated its position, and under Ayatollah Khomeini's leadership appeared inflexible with respect to terminating the war early. The Iranian government issued its demands for a cease-fire: complete Iraqi withdrawal from all Iranian territory, full war compensation (by the end of 1983 this was estimated at \$150 billion), and the return to Iraq of 100,000 previously expelled Shias.²⁹ Not surprisingly, Baghdad viewed the terms as unacceptable.

The decision to initially employ chemical agents against Iranian troops most likely came from Saddam himself, as release authority was apparently not delegated to even corps-level commanders. Iraqi military planners needed to marshal limited amounts of Iraq's chemical arsenal and ensure sufficient quantities to thwart massive Iranian offensives.³⁰ Even though the Iraqis had established an impressive CW production capability by the mid-1980s, Iraq's declared total production output of both nerve and blister agents amounted to close to four thousand tons.³¹

At this time, Iraq's chemical capabilities did not provide Iraq with the tactical and strategic leverage its military planners may have initially thought. Its stockpile of agents was limited, the agents varied in degrees of purity, delivery systems were inefficient, and the military had ill-defined concepts of operations. According to one expert's study, a significant amount of agent was needed to saturate the battlespace: 14 liquid tons of tabun or two tons of aerosolized tabun were needed to saturate one square kilometer, or half a ton of sarin for the same area.³² Based on these modeling assessments, it appeared that the Iraqis did not have the huge CW stores that would have enabled them to massively saturate Iranian troops.

In 1982, Iraq reportedly first used the riot control agent CS, or tear gas, against Iranian troop concentrations. Iraq had developed riot control agents during the 1970s, in response to the Kurdish problem in northern Iraq. Iraq used riot control agents in 1982 to disrupt Iranian troop formations by forcing the Iranians to don protective gear and to allow for the retreat of Iraqi troops.

During 1983, Iraq began to use chemical agents with some regularity against Iranian troops. It is generally accepted that Iraq's first major employment of chemi-

cal agents occurred in July or August 1983 during the Val Fajr II campaign near Haj Umran.³³ U.S. intelligence reports indicate that mustard agent was used. According to these reports, at this time Iraqi military planners apparently disregarded the effect of environmental conditions and the safety of Iraqi forces. As the following narrative explains, these early Iraqi CW attacks lacked sophistication and an understanding of mustard agent:

In the 1983 employment, the Iraqis used mustard gas against an Iranian force which had captured a mountain top position. Unfamiliarity with the gas characteristics caused the attack to fail. Mustard gas is heavier than air and seeks the lowest elevation. The Iraqis discovered this as they attempted to counterattack up the mountain only to be met and overwhelmed by their own weapon.³⁴

Moreover, when Iraq first used chemical agents, unfavorable wind and weather conditions, coupled with an inability to deliver the agent on target, hindered the attacks' effectiveness. By November 1983, Iraq was using mustard agent extensively against Iranian troops in northeastern Iraq, which caused hundreds of chemical casualties.³⁵

Despite the initial ineffectiveness of their chemical attacks, the Iraqis demonstrated a rapid learning curve with CW use. During early 1984, the Iraqis became the first nation to use nerve agents on the modern battlefield, as the nerve agent tabun was used against Iranian forces during the Khaybar I campaign in the Manjooon Islands near Basra. As the Manjooon Islands were strategically vital and oil-rich, Baghdad decided that this territory could not fall into the hands of the Iranians, who had occupied the territory earlier and established a strong defense. Iraqi troops reportedly began using tabun only after a number of hard-hitting counteroffensives failed. While Iranian CW-casualties were significant, those figures might have been greater if not for effective Iranian defensive measures such as protective masks, atropine injectors, and limited amounts of protective clothing. Despite the use of tabun, the Iranians were not dislodged from the islands.³⁶

As 1984 progressed, the Iraqis became more adept at using their chemical capabilities:

One of the most dramatic examples was in operation Khaybar I in February 1984. In this operation, the Iranians attacked through the

Hawizah marshes, attempting to cut the Basra-Baghdad road. In a notable example of battlefield interdiction, the Iraqis isolated the forward elements of the attacking force with Mustard, cutting it off almost from resupply by land. When the Iraqis counterattacked, they encountered Iranians who had no ammunition and who had not eaten for several days.³⁷

In addition, the Iraqis began targeting Iranian infantry at assembly and staging areas, causing poorly protected or trained troops and volunteers to flee. Therefore, from a tactical military perspective, Iraqi commanders decided that CW afforded significant advantages, such as degrading rear-echelon performance and morale, and disrupting command and control activities.³⁸

The International Response

During this period, Iran began its first attempts to highlight Iraq's flagrant violation of the 1925 Geneva Protocol. After sustaining CW attacks in November 1983, the Iranians began to circulate color pamphlets in Western Europe that depicted chemical casualties in Tehran hospitals. Despite this public relations campaign to call attention to the Iraqi chemical attacks, Iran's claims received little fanfare in the West. By March 1984, Iran had dispatched at least 50 CW casualties to various European nations (the United Kingdom, Belgium, Austria, Switzerland, and Sweden) in order to display graphically the results of Iraqi chemical attacks. Despite the apparent evidence that Iraq had indeed used CW against Iran and Iran's attempts to publicize such activity, the lack of international criticism most likely emboldened Saddam and other senior Iraqi decisionmakers to expand Iraq's chemical attacks.

France, arguably Iraq's staunchest supporter during the Iran-Iraq War, was silent on the issue of Iraqi chemical attacks. France's largest newspapers, *Le Monde* and *France-Soir*, even indulged in speculation that the Iranian chemical casualties were the result of factory workers injured in an industrial accident. At this time, the British, French, and U.S. governments were silent on the matter, while the Iranians bitterly charged the French, British, and Soviets with supplying and promoting Iraq's CW program.³⁹ For example, the British government issued a formal statement in response to an Iranian claim of CW-assistance to Iran: "We are neutral in the conflict. We have not supplied any lethal equipment to either side. Allegations to the contrary are untrue. We

have not supplied any chemical weapons, or equipment for use in their manufacture, to Iraq.⁴⁰

By the spring of 1984, it appeared that the major powers of Western Europe were not interested in punishing—or even openly criticizing—Iraq for its CW activities against Iran. However, the U.S. press⁴¹ and the U.S. Congress paid greater attention to the issue. Certain groups within Congress expressed their repugnance over Iraq's use of CW, and an effort was undertaken to reinstate Iraq on the list of nations that supported terrorism. The U.S. State Department announced that “available evidence indicated that Iraq has used lethal chemical weapons” and that the government “strongly condemns this practice.”⁴² The British government reversed its earlier position by openly denouncing Iraqi CW use and embargoed eight chemical precursors to both Iran and Iraq.⁴³

The United Nations also began to investigate formally Iran's allegations of Iraqi chemical attacks. According to an Iranian Revolutionary Guards physician, Iraq had conducted at least 49 chemical attacks against Iranian forces by February 1984.⁴⁴ In March 1984, the United Nations dispatched an investigative team, and a March 30 statement condemned the use of CW and all other violations of international humanitarian law. Prior to March 1988, while a number of U.N. Security Council resolutions (Nos. 479, 487, 514, 522, 540, and 552) were adopted that called on both parties to cease fighting, respect international humanitarian law, and begin negotiations for a settlement, none addressed the issue of CW use. Only Security Council resolutions 582 (February 24, 1986), 598 (July 20, 1987), and 612 (May 9, 1988) addressed the issue of CW use in the war. These resolutions will be addressed below.

The U.N. effort to investigate Iran's claims began in early March 1984 when then-Secretary-General Javier Perez de Cuellar dispatched an international team of experts drawn from Australia, Spain, Sweden, and Switzerland. A press account of this investigation indicated that the Iranians claimed to have suffered 2,000 CW-related casualties, 30 percent of which were critical.⁴⁵ The team collected samples from and inspected areas where chemical agents were purportedly used, including cities like Ahvaz (located in the Khuzestan province). The team completed its activities and filed a report with the U.N. Security Council. Dated March 26, the report stated:

- a) Chemical weapons in the form of aerial bombs have been used in areas in Iran [surveyed] by the specialists
- b) The types of chemical agents used bis-(2-chlorethyl)-sulfide (mustard gas), and ethyl N,N-dimethylphosphoamidocyanidate—a nerve agent known as Tabun.⁴⁶

Following the release of this report, Great Britain, the United States, France, and Japan banned the sale to Iraq of precursor chemicals involved in the production of mustard and nerve agents. Australia joined that ban in August 1984.⁴⁷

Developments from 1984 to 1986

The fighting between Iran and Iraq continued through 1984 to 1986 in roughly the same fashion as the previous two years: one side would launch a major offensive that would later bog down, while the other side would reassemble its forces and launch a counteroffensive that would result in a similar fate. CW continued to play an integral part in Iraqi strategy between 1984 and 1986, and during this time Iraq expanded and refined its methods for CW use. According to declassified U.S. intelligence reports, the preferred method of delivery for CW attacks involved the release of 250- or 500-kilogram bombs. An Iraqi Mig-23 pilot stated that during such attacks, bombs were released in random patterns from altitudes between three to four thousand meters. Examination of craters produced during the war showed them to be four meters in diameter and two- to three-meters deep, with debris spread over a 20- to 30-meter radius. In addition, mustard droplets were detected at distances up to 100 meters from such craters.⁴⁸ As the war progressed, Iraqi pilots began to fly at lower altitudes in order to ensure greater precision with respect to chemical agent bombing runs; they had been hesitant to do this during the early stages of the war. When using helicopters to deliver chemical agents, Iraq would employ the use of two or three helicopters flying in attack clusters. These helicopters carried bombs configured in 220-liter containers that detonated upon contact with the ground.⁴⁹ Other intelligence reports indicated that Iraqi helicopters dropped 55-gallon drums containing chemical agents from altitudes of three to four thousand feet, while attack helicopters like Mi-8 HIPs were outfitted with 1,000-liter spray tanks for use against troop concentrations.⁵⁰ While air-delivered bombs and helicopter operations were the methods of choice for CW, the Iraqis

also employed CW-capable artillery and mortars extensively. According to U.S. intelligence reports, the Iraqis managed to achieve a multiplier effect by using many mortar tubes or artillery pieces simultaneously to saturate an area. This allowed for greater area coverage than provided by independent firing of those same pieces. A respected munitions expert remarked that “Iraq’s chemical employment tactics have also evolved. The effective integration into combined arms operations of multiple delivery systems dispersing multiple chemical agents against multiple specific targets is no small feat....”⁵¹

By mid-1984, some reports indicated that Iraq had operationalized a mustard agent variant known as “dusty mustard.” Whereas classic mustard is a persistent (between 32 to 36 hours, depending on ambient conditions), oily liquid that usually takes four to six hours for tissue corruption, dusty mustard was somewhat different in form and effect. Dusty mustard agent was comprised of solid particulates impregnated with mustard agent, which formed a dust cloud when released. The cloud was comprised of minute particles, which if inhaled into the lungs could begin corrupting lung tissue within 10 to 15 minutes.⁵² According to one report, the use of dusty mustard was unique: “...the use of a fine aerosol or gas-phase vesicant, without attendant liquid contamination, is unusual. The result is a chemical munition that produces many of the devastating psychological effects of mustard gas but with the physical characteristics of a nonpersistent chemical agent.”⁵³ Also, during this time, Iraq began to expand its production capabilities of other nerve agents like sarin and VX. While there is some evidence that sarin may have been used during the latter stages of the war, there is no evidence to date confirming allegations of the use of VX.

Based on these factors, Iraq’s expanded use of CW between 1984 and 1986 contributed to tactical military successes, and potentially strategic political gains, in the conflict with Iran. Apparently, Iraq used CW to signal its willingness to defend its territory at all costs, while simultaneously inflicting significant casualties on Iran. Iraq thus hoped to force Iran to the negotiating table to end the war.⁵⁴ Whatever Iraq’s strategic designs, the tactical results were impressive: “Whenever the Iraqis used good delivery techniques, weather conditions and terrain were favorable, and the Iranians were not adequately prepared or trained, the use of chemical weapons has been effective.”⁵⁵ However, intelligence reports also indicated that the employment of CW alone would not

redress the serious deficiencies in Iraq’s military capabilities:

CW, ineptly employed, has not proved to be a panacea to make up for other weaknesses. Non-chemical tactical weakness such as failure to maximize advantages and ineffective employment of tactical airpower carry over into employment of CW. CW employment shortcomings have included use of inadequate concentrations in relation to required area coverage, enemy troop numbers, weather and terrain, ineffective delivery, and failure to integrate CW properly with the scheme of maneuver.⁵⁶

The International Response

Between 1984 and 1986, Iran continued to publicize Iraq’s flagrant violations of the Geneva Protocol. While the majority of the international community either dismissed such allegations outright, or made public statements mentioning their disdain over the use of CW during the conflict, little concrete action was taken to address Iraq’s actions. However, during early 1984, as noted earlier, President Reagan dispatched Vice-President Bush to Geneva to provide momentum for negotiations on the CWC. Despite these good intentions, those negotiations were marked by intense differences between East and West or North and South, and discussions between parties were often shaped by the Cold War alignments at the time.

While the major powers appeared disinterested or unwilling to recognize the gravity of Iraq’s use of CW, Australia did attempt to galvanize international attention to the issue. Australian diplomacy encouraged other Western countries to heed the dangers posed by CW proliferation as demonstrated by Iraq’s use of CW against Iran. By late 1984, Australian diplomatic initiatives called for the creation of a mechanism that would address the rising specter of CW in a Third World—as apart from an East/West—context. As a result of these activities, the Australia Group (AG) was formed in mid-1985 as a consultative body that could hopefully address the serious issues raised by the Iran-Iraq War. The AG was established to act as an informal forum of states, chaired by Australia. Its goal was to discourage chemical and biological proliferation by harmonizing national export controls on CW precursor chemicals, biological agents, and CBW dual-use production equipment; sharing in-

formation on CBW-proliferation developments; and pursuing other measures. The AG first met in June 1985 and by September 1985 had developed a warning list. By May 1986, it had created a warning list of 35 precursor chemicals that could be involved in the production of CW.⁵⁷

The issue of Iraq's use of CW also began to receive even greater attention in the U.N. Security Council. Whereas U.N. Security Council resolutions prior to 1986 had failed to mention the use of CW or Iraq as the aggressor with respect to CW activities, U.N. Security Council resolution 582 (February 24, 1986) took a different approach. The document noted that both Iran and Iraq were parties to the Geneva Protocol, and it deplored "...the use of chemical weapons contrary to obligations under..." the Protocol.⁵⁸ Resolution 588, while not addressing the issue of CW directly, called on both parties to implement the provisions of resolution 582.

Developments from 1987 to 1988

During the period 1984 to 1986, Iraq's use of CW was gradual, but from 1987 to 1988, Iraq intensified the tempo and scope of its chemical attacks. These developments occurred against the backdrop of heightened international awareness of Iraq's CW practices. The issue of Iraq's violation of the Geneva Protocol did not revolve around differences of interpretation regarding verification or compliance. By this time, it was well-established that Iraq had indeed violated the Protocol and that the evidence affirming this was incontrovertible, if not widely known. The problem for the international community now centered around deciding on whether to punish Iraq (and then perhaps Iran) for these transgressions. During the last two years of the conflict, despite the concerns of some nations, the use of CW escalated and neither Iraq nor, according to some reports, Iran refrained from their use.

While Iranian forces attempted numerous offensives from late 1986 to early 1988, Iraq accelerated its use of chemical agents against staging areas. The targeting of rear support troops, most of whom were poorly trained or equipped to operate in a chemical environment, acted as a force multiplier for the Iraqis. According to U.S. intelligence data, the use of CW combined with conventional tactics, as was done in the Karbala VII Campaign during April 1987, proved successful for Iraq.⁵⁹ Furthermore, the use of chemicals was no longer relegated to

defensive or counteroffensive operations. By early 1988, Iraq began conducting offensives to recapture territory using CW. Iraq used chemicals to "soften" an area prior to a conventional attack, and Iraqi forces would wait for favorable wind conditions and the effects of the agent employed to diminish before moving into a contaminated area. According to U.S. intelligence reports, usually 30 minutes to one hour was needed prior to allowing Iraqi forces to enter a previously contaminated area, and Iraqi troops also were equipped with protective overgarments and gas masks.⁶⁰ It was reported that during these offensives, the Iraqis would use large quantities of sarin to contaminate Iranian positions.⁶¹ In April 1988, the Iraqis unleashed an artillery barrage of chemical rounds during a massive assault on Iranian positions in the strategic Fao Peninsula.⁶²

By this time, Iranian forces were better protected and equipped to operate in a chemical environment, and there are reports that Iranian forces also began to retaliate with chemical attacks either from captured Iraqi chemical stores or indigenously produced agent stockpiles. While Iran's chemical defense capabilities in 1984 were modest at best (according to one report, this capability consisted of respirators, thin rubber gloves, and plastic laundry bags), by 1988 Iranian forces were better prepared to defend against Iraqi chemical attacks.⁶³

During the war, Ayatollah Khomeini reportedly decreed that CW could not be employed without his approval. Reportedly, he had dismissed an inquiry into the feasibility of such an attack on Iraq due to the argument that Islam prohibits its fighters from polluting the environment, even during a *jihad* or holy war.⁶⁴ In December 1986, Iran's former prime minister, Hussein Musavi, announced that Iran had developed its own chemical warfare technology. A year later he informed the Iranian parliament (Majlis) that while the military had produced "sophisticated chemical weapons," it would not use them as long as it was not forced to, and that it would abide by all international conventions regulating the use of such weapons.⁶⁵ While Iran paid "lip service" to upholding the norms of the 1925 Geneva Protocol, Iranian decisionmakers eventually believed that their immediate security concerns and strategic objectives outweighed the long-term benefits provided by the Protocol. Notably, Iran could have invoked the Protocol's reservations regarding retaliatory use to justify its resort to chemical attacks, since Iraq was recognized as the first party to introduce the weapons into the conflict.

Even though Iran could retaliate in kind to a limited degree and had improved its defensive capabilities against Iraqi chemical attacks, the psychological impact of those attacks on Iranian forces continued to be severe.

The employment of chemical weapons and the publishing of its effects on the human body had its effects...on the national morale in Iran. It affected directly the spirit of volunteering and the normal contingent of Baseeji volunteers attached to Iran's Revolutionary Guard...fell off by one third.⁶⁶

The psychological impact of chemical attacks was demonstrated during the "War of the Cities" from February to April 1988, when Iran and Iraq callously began to target civilian population centers with ballistic missile attacks. The fear of chemically tipped Scuds was so great that some reports indicate that up to one-quarter to one-half of Tehran's population fled during that period.⁶⁷

While Iraqi chemical attacks intensified against Iranian forces, chemicals were also used against rebellious Kurdish factions. While Iraq had long-used CS to quell local disturbances in Kurdistan, the military use of CW against Kurdish elements had not been employed. However, when Iran launched its last large offensive in the spring of 1988, Iranian forces drove far into Iraqi Kurdistan and threatened to capture the Darbandi Khan reservoir and hydroelectric plant at Dukan. These facilities were critical in generating hydroelectric power for Baghdad, and losing the dam would have been a critical loss for Iraq. As Iranian forces drove through the mountains towards Kirkuk, Iraqi forces used chemical agents.⁶⁸ However, the single most publicized incident of the conflict occurred in March 1988, when Iraqi forces bombarded the town of Halabjah with various chemical agents over the course of three days.⁶⁹ The town, which had been under Iranian occupation as a result of Iran's spring offensive, suffered a large number of chemical casualties, and reports indicate that between 5,000 to 8,000 people, including Kurdish civilians (mostly women, children, and the elderly) perished in the attack.⁷⁰ It was only after this attack that Iraq faced strong international condemnation.

Set against the backdrop of Iraq's strategic environment, Iraq's use of CW in mid-1988 appeared to be a policy of last resort and desperation. By this time, Iraq had suffered hundreds of thousands of casualties, was

billions of dollars in debt, faced a war-weary population, and had seen its infrastructure heavily damaged. The use of CW, especially nerve agents, was meant to signal Iraq's determination to sue for peace and force Iran to the negotiating table. In 1988, the use of chemicals in offensives to recapture the Fao Peninsula and Manjoon Islands, and the shocking use against the Kurds demonstrated Iraq's intent. Even if Iran's claims of suffering 60,000 CW-related casualties are correct, this figure represents a small portion of Iran's overall casualties suffered during the war (between 500,000 to 600,000).⁷¹ However, the powerful psychological impact of these attacks, especially against Iranian troops and civilians in the latter stages of the conflict must not be discounted. While Iraq's use of CW was not the sole factor that forced Iran to grudgingly accept the U.N.-sponsored cease-fire of August 20, 1988, the use of CW left a deep impression on decisionmakers in Tehran.⁷² The following description of Iran's motivations in accepting the U.N. cease-fire is instructive:

The Iranian decision resulted from an accumulation of factors: the inability of the Iranian military to overcome losses suffered during the attack on Basra at the end of 1986; the Iraqi advantage in the tanker war, especially after the U.S. entry in the gulf; the demoralizing impact of Iraqi attacks on civilian targets during the war of the cities; **the fear in the Iranian army that Iraq would again use chemical weapons**;...the recent defeats of the Iranian army at Fao, Shalamchah, Manjoon, and Dehloran; and the nearly ten-to-one advantage Iraq possessed in battle tanks.⁷³

The International Response

By 1987, the United Nations was deeply involved in attempting to end the conflict as it appeared that it had begun to spiral out of control. The "tanker war" that began in 1984—where both Iran and Iraq targeted civilian shipping, especially oil tankers, plying the Gulf—escalated to the degree where the United States and other Western powers heightened their involvement. In 1987, Kuwait persuaded the United States to offer protection to the Kuwaiti oil fleet, and 11 Kuwaiti oil tankers were reflagged under the auspices of the United States. Given these circumstances, on July 20, 1987, the U.N. Security Council adopted resolution 598, which called for an immediate cease-fire between the combatants, given the

“heavy loss of life and human destruction.” Resolution 598 also spelled out the terms for an eventual cease-fire. In addition, the resolution set forth the most assertive language to date with respect to the issue of CW:

The Security Council...[d]eploring also the bombing of purely civilian population centers, attacks on neutral shipping or civilian aircraft, the violation of international humanitarian law and other laws of armed conflict, and, in particular, the use of chemical weapons contrary to obligations under the 1925 Geneva Protocol....⁷⁴

While Iraq accepted the terms contained within resolution 598, Iran continued to reject it. By mid-1987, Iranian decisionmakers apparently calculated that the terms of the agreement were unsatisfactory, and that they might still make significant gains in the war. Also, many Iranian leaders felt that the international community had not condemned Iraq as they believed warranted by the situation. Finally, despite Iraq’s use of CW and its other violations of international law, the international community now perceived Iran as the aggressor. This perception, driven largely by the strident anti-U.S. rhetoric emanating from Tehran and the reciprocal U.S. attitudes toward Iran, continued to be of concern in Tehran.

After the chemical attack at Halabjah in March 1988, Iran intensified efforts to see Iraq punished. On March 17, 1988, Iran’s ambassador to the United Nations sent a letter to the secretary-general indicating that Iraqi warplanes had used CW in the “operational theater of Valfajr,” while a second letter the same day reported that chemicals had been used in Kurdish areas. This correspondence urged the Security Council to uphold the Geneva Protocol and to compel Iraq to stop using CW, thus relieving Iran “of the agony of considering retaliatory measures.” Iran also asked for another investigative team to be sent to chemically affected areas.⁷⁵

Ali Velayati, then Iran’s Foreign Minister, also wrote the secretary-general in March 1988 and complained that despite unambiguous evidence, the U.N. Security Council had failed to take action to prevent Iraq’s CW attacks. Velayati also announced that Iraq had used CW against Kurds in Halabjah, and declared:

This irresponsible and indifferent attitude of the Security Council has indeed encouraged and emboldened Iraq to employ chemical weapons even against innocent Iraqi civil-

ians.... What is the effect of these crimes on the one hand and the silence of the United Nations on the other?⁷⁶

Iran’s ambassador to the United Nations in letters dated March 21 and March 25 to Secretary-General Perez de Cuellar also echoed these sentiments.

After receiving these letters, Secretary-General Perez de Cuellar dispatched Dr. Manuel Dominguez, a Spanish Army Medical Corps colonel, to investigate both Iran and Iraq’s claims. During his investigations in Iran from March 28 to March 31, Dr. Dominguez examined patients in medical facilities in Tehran and Bakhtaran and found that victims had been exposed to mustard and nerve agents. The patients claimed they had been injured in the March 16-18 Halabjah attacks or in the Marivan-Nowdoshe-Sanandaj area of Iran between March 17 and March 27. Based on these and other assessments, Dominguez concluded:

Compared with previous years, there has been an increase in the intensity of the attacks with chemical agents, in terms of both the number of victims and...the severity of injuries sustained. Furthermore, there appeared to be a higher proportion of civilians among those affected than in previous investigations.⁷⁷

During his investigation in Iraq from April 8 to April 11, Dr. Dominguez examined 39 military casualties at the Al Rasheed Military Hospital in Baghdad, who explained that they had been injured by chemicals delivered by aerial bombs or artillery shells in the Halabjah area around March 30. Dr. Dominguez concluded that all 39 patients had been exposed to mustard gas, and that four had also been exposed to low levels of nerve agent. Dr. Dominguez transmitted his findings to the Secretary-General, Perez de Cuellar, who then forwarded it to the Security Council. However, Perez de Cuellar did not believe that the Security Council would be able to recommend or take concrete action against the use of CW because there were few options for the international community to punish Iraq or Iran and there were serious differences of opinion between the major powers as to the appropriate response to such transgressions. He stated, “only concerted efforts at the political level could prevent the irreparable weakening of the Geneva Protocol.”⁷⁸

With respect to the U.S. position on the Halabjah incident, a State Department spokesperson indicated that

the attack “appears to be a particularly grave violation of the 1925 Geneva Protocol against chemical warfare.”⁷⁹ White House spokesperson Marlin Fitzwater also stated “Everyone in the administration saw the same reports you saw last night. They were horrible, outrageous, disgusting and should serve as a reminder to all countries of why chemical warfare should be banned.”⁸⁰

In April 1988, the Security Council president was Algeria’s ambassador Hocine Djoudi. According to one source, Algeria had little desire to take the lead in drawing attention to the use of CW by two other non-aligned nations. The five permanent members of the U.N. Security Council, while not objecting to council action on the issue of CW, were embroiled in a debate about whether to impose sanctions or an arms embargo on Iran. Germany, Italy, and Japan took the lead in drafting a new resolution on the issue of CW because France, the United Kingdom, and the United States had relations with Iraq. In contrast, Germany, Italy, and Japan all maintained strong commercial ties with Iran. By leading on the issue, Germany hoped to counter criticism that some of its industrial giants either intentionally or unknowingly assisted in the development of Iraq’s CW program. After two weeks of intense diplomatic jockeying, the Security Council adopted resolution 612 on May 9, 1988.⁸¹

Resolution 612’s language was unusually somber and reflected the Council’s “dismay” about the investigative mission’s conclusion that the use of CW had expanded to include civilians. It called for both Iran and Iraq to strictly observe the Geneva Protocol, “vigorously condemned” the use of CW by both sides, noted an expectation that both sides refrain from future use, and called for the creation of tighter export control restrictions.⁸²

As noted above, on July 18, 1988, Iran grudgingly accepted the terms of resolution 598 and accepted the U.N.-sponsored cease-fire. Iraqi officials indicated that despite Iran’s acceptance of the resolution’s terms, the war would continue since Iran would not agree to engage in direct dialogue with Iraq regarding the terms of a cease-fire agreement. On July 14, then-Vice President Bush and Iranian Foreign Minister Velayati addressed the Security Council. Velayati railed against the U.S. presence in the Gulf, the shooting down of the Iranian civilian Airbus by the *U.S.S. Vincennes*, and the Security Council’s refusal to deal objectively with the “acts of aggression already committed.” Bush replied by indicating that the critical issue before the Council was

Iran’s continued refusal to comply with the terms of resolution 598. He did, however, make a special appeal for a stop in the use of CW.⁸³

On August 8, 1988, Secretary-General Perez de Cuellar announced that the cease-fire agreement would take effect on August 20, yet the Security Council was still tackling the issue of CW. On August 26, it passed another resolution, 620, that also expressed intense concern over the continued use of CW by Iraq and allegedly by Iran. The resolution stipulated that the council would be “determined in its efforts to end all use of chemical weapons,” condemned “resolutely” the use of CW between Iran and Iraq, and encouraged the secretary-general to carry out prompt investigations into allegations by any U.N. member state concerning the possible use of chemical or biological weapons. It also included language that the council, when appropriate, would consider “appropriate and effective” measures against the future use of CW by any nation.⁸⁴

LESSONS LEARNED

A number of important tactical and strategic lessons were impressed upon both combatants during the Iran-Iraq War with respect to the use of CW. These lessons were also recognized, if not fully appreciated, by the rest of the international community during the conflict. For Iran, what was most disturbing about Iraq’s use of CW was the muted international criticism of Iraq for conducting such flagrant violations of the 1925 Geneva Protocol. In the eyes of many in the Iranian leadership, the international community’s failure to condemn or punish Iraq for its CW attacks against Iran (Iraq was only severely criticized after it unleashed nerve gas attacks against the Kurdish town of Halabjah in March 1988) demonstrated the depth of international indifference—if not outright hostility—toward Iran. Iranian decisionmakers concluded that the international community’s tepid response to Iraq’s chemical attacks signaled that the global powers were more likely to reward violations of international law than to recognize the dangerous precedent Iraq had established, at least when Iran was the involved in such conflicts. Iraq’s CW attacks reinforced Iran’s strategic insecurities, and most likely motivated Iran to try to acquire or produce WMD, especially CW agents. Moreover, given the effectiveness of Iraqi CW attacks against Iranian forces (especially during the latter stages of the campaign), Iranian com-

manders also began to appreciate the tactical, if not strategic, utility of CW on the battlefield.

Iraq's experience with CW during the Iran-Iraq War reinforced the belief of senior Iraqi leaders that aggressive conduct in the region would be tolerated, as long as Iraq did not directly threaten U.S. or Western interests and its conduct did not exceed certain thresholds. Iraq was not severely criticized for its use of CW until after the March 1988 attack on Halabjah; its previous five or six years of CW use against Iran was not given the serious attention it deserved due to higher priorities set by the international community. Despite the relative weakness of the Geneva Protocol, had Iraq chosen to employ CW against a regional actor other than Iran, the international response (despite the lack of stringent arms control measures to support such activity) might have been more assertive. However, there is no way to be certain of the outcome. The international community's failure to punish Iraq for its use of CW in the Iran-Iraq War most likely emboldened Iraqi decisionmakers and may have contributed to a risk calculus that fostered Iraq's plans to invade Kuwait in August 1990.

Beyond the strategic and tactical lessons learned by the combatants in the conflict though, lay the issue of arms control and compliance. Further limiting efforts to punish noncompliance with the Geneva Protocol was the international political and economic context of the war. Many nations and private commercial interests benefited greatly from the sale of arms and technology to both combatants. Imposing embargoes on either side for the use of CW would have greatly hampered those commercial efforts. A parallel can be drawn to a more recent experience that involves tensions between competing economic and nonproliferation agendas: the troubles experienced by the Clinton administration with respect to its policy on China. While apparently eager to engage China economically and enjoy the commercial benefits of conducting business with the world's largest developing market, the Clinton administration may have let similarly important nonproliferation objectives vis-à-vis China assume a lesser priority. The United States, however, is not the only Western nation that has come under scrutiny in such circumstances. Since the early 1980s, most of the major European nations, including France, Germany, Italy, and the United Kingdom, have at one time or another been accused of placing national commercial interests ahead of international nonproliferation or arms control priorities.

In the political sphere, many Western powers were reluctant to punish instances of noncompliance with the Geneva Protocol when both violators were deemed as challenges to regional security. Determining "good" from "bad" was an exercise in moderation during the Iran-Iraq War. Also, the fear of an Iranian-inspired or -backed revolt sweeping across the Arabian Peninsula into the vitally important oil-producing nations like Kuwait or Saudi Arabia, or into "moderate" and staunchly pro-Western Arab states in the Middle East like Jordan or Egypt, was a development that many in the United States, if not the West, could not tolerate. Therefore, many Western states saw nominally backing Iraq, despite Iraq's track record as an aspiring regional hegemon and Saddam Hussein's ruthless personal ambitions, as a lesser of two evils. Iran, despite its "victimization" as a result of Iraqi chemical attacks, had done little to convince Western powers, and especially the United States, that it posed no threat to Western economic and political interests in the Gulf. Moreover, Iran's support of terrorist activity against the West, moderate Arab states, and against Israel during the 1980s, in addition to its resoundingly militant anti-Western rhetoric, effectively dampened its chances for winning overt political support for its cause during the war with Iraq.

The Iran-Iraq War demonstrated the limitations of arms control agreements that do not contain appropriate mechanisms to respond effectively to instances of noncompliance. The shortcomings of the Geneva Protocol have already been noted. What the international community was left with at the time of the Iran-Iraq War was an arms control agreement that provided little, if any, practical response to deal with such transgressions. Furthermore, by the mid-1980s, some analysts argued that even the norm against the use of CW set forth in the Protocol had already been eroded, if not attenuated, given the specter of CW use in World War II, Egypt's use of CW in Yemen in the early 1960s, the U.S. use of herbicides in Vietnam, and the allegations of Soviet use in Afghanistan and Southeast Asia during the late 1970s.⁸⁵ The Iran-Iraq War starkly demonstrated that arms control norms alone did not then and may not in the future promote compliance. Norms, however, coupled with an effective legal instrument that not only punishes violations upon detection but also prevents violations in the first place might prove to be a powerful deterrent in the future. Such a legal instrument should include aggressive monitoring, reporting, and surveillance mecha-

nisms. However, arms control mechanisms need the sustained and serious political support of the international community in order to promote the compliance agendas contained in those treaties.

The CWC provides such a legal foundation, and the treaty's verification, compliance, enforcement, and confidence-building measures have been ongoing for the last three years. However, it is difficult to assess whether the treaty has had any impact on stemming or reversing the spread of CW in regions and nations of proliferation concern. Moreover, since the entry into force of the treaty in 1997, the international community has not been forced to take full advantage of the CWC's stringent mechanisms to punish instances of use between CWC signatories. If such a scenario manifests itself in the future, the international community should use the mechanisms under the CWC to penalize the treaty's violators, and more importantly, resolutely condemn any use of chemical weapons irrespective of the nature of the conflict or the political orientation of the combatants. A swift and serious response by the international community will help ensure further compliance with CWC in particular, and compliance with arms control efforts on a broader scale.

¹ One source indicated that during the war Iran suffered between 400,000 to 600,000 dead, while Iraq suffered about 150,000 dead, 500,000 wounded, and 70,000 captured. See Patrick Brogan, "Iraq," *The Fighting Never Stopped* (New York: Vintage Books, 1990), p. 263.

² It is estimated that Iraq received almost \$60 billion in subsidies from sympathetic Arab and Gulf neighbors during the war, while Iran's oil revenues dropped from \$20 billion in 1982 to \$5 billion by 1988. Ibid., pp. 252, 266.

³ According to one report, the importance of the Iraqi chemical experience in the war with Iran was not lost on many interested nations in the immediate aftermath of the conflict. One U.S. source stated "Military missions have been virtually queuing up in Baghdad to see how Iraq did it . . . Poor countries see CW as the equalizer, a kind of giant-killer which can act as a deterrent against a powerful neighbor." See Martin Walker, "Iraq's Use of Chemical Arms Main Source of U.S. Fears," *The Guardian (London)*, January 6, 1989, p. 1.

⁴ According to one source, of the total of 272,000 U.S. casualties during World War I, there were over 72,000 chemical casualties with 1,200 deaths attributed to battlefield chemical agent exposure. See Frederick Sidell, Ernest Takafuji, and David Franz, et al., *Medical Aspects of Chemical and Biological Warfare* (Washington, D.C.: Walter Reed Army Medical Center, 1997), p. 24.

⁵ "Geneva Protocol," *Arms Control and Disarmament Agreements—Texts and Histories of the Negotiations* (Washington, D.C.: U.S. Arms Control and Disarmament Agency, 6th Edition, 1996), pp. 5-7.

⁶ Jean Pascal Zanders, "The CWC in the Context of the 1925 Geneva Debates," *Nonproliferation Review* 3 (Spring-Summer 1996), p. 43.

⁷ "Geneva Protocol," *Arms Control and Disarmament Agreements*, pp. 5-6.

⁸ Ibid., p. 7.

⁹ Iran signed the BWC on April 10, 1972 and ratified the treaty on August 22, 1973. Iraq signed the BWC on May 11, 1972, yet only ratified the treaty after the Gulf War (April 18, 1991). Iraq ratified as a result of complying with the terms of U.N. resolutions imposed after that conflict. Ibid., p. 102.

¹⁰ Andrew Terrill, "Chemical Weapons in the Gulf War," *Strategic Review* (Spring 1986), p. 55.

¹¹ Such reasoning may be found in other instances of arms control noncompliance. For example, key Soviet decisionmakers apparently approved of the decision to move forward with the massive and complex biological weapons program—organized and controlled under the aegis of a civilian-cum-military structure known as Biopreparat—after the Soviet Union had signed the 1972 BWC. According to Ken Alibek, the highest ranking official ever to defect from the Biopreparat apparatus, senior Soviet officials regarded the BWC as little more than a "scrap of paper," whose provisions against the use, research and development, production, and stockpiling of biological warfare agents could be circumvented under the terms of the treaty or disregarded completely. For the most detailed accounting of the history and activities of the Soviet/Russian biological weapons program, see Ken Alibek and Stephen Handelman, *Biohazard* (New York: Random House, 1999).

¹² See Efraim Karsh and Inari Rautsi, *Saddam Hussein: A Political Biography* (New York: MacMillan Incorporated, April 1991); Elaine Sciolino, *The Outlaw State: Saddam Hussein's Quest for Power and the Gulf Crisis* (New York: Wiley, John, and Sons Inc., 1991) and Samir al-Khalil, *The Republic of Fear* (New York: Pantheon Books, 1990).

¹³ Seth Carus, "The Genie Unleashed: Iraq's Chemical and Biological Weapons Production," *The Washington Institute Policy Papers*, No. 14 (Washington, D.C.: The Washington Institute for Near East Policy, 1989), p. 7.

¹⁴ William Polk, "The Iran-Iraq War," *The Arab World Today* (Cambridge, MA: Harvard University Press, 4th Edition, 1991), pp. 335-336; also see Dilip Hiro, "The Founding of the Islamic Republic," *Iran Under the Ayatollahs* (New York: Routledge and Kegan Paul Inc., 1987), pp. 106-107.

¹⁵ The "Kurdish question" had been a long-standing thorn in the side of Iraq, since the significant Iraqi Kurdish minority (between 20-25 percent of the total population) had been fighting for autonomy from Baghdad for decades. Under the Algiers Accord, the language that was created to control the issues of the Shatt-al-Arab waterway and Iran's support for Kurdish guerillas stated that both nations agreed "to delimit 'fluvial frontiers according to the thalweg line' and to 'end all acts of infiltration of a subversive nature.'" Hiro, "The Gulf War," *Iran Under the Ayatollahs*, p. 165. For a detailed description of the historical events that lead up to the 1975 Algiers Accord, see Col. (Retd) S.G. Mehdi, "Shatt-Al-Arab: A Survey of Wars and Treaties," <<http://www.defencejournal.com/jul99/shatt-al-arab.htm>>.

¹⁶ For an analysis of the potential motivations underlying Iraq's decision to invade Iran, see Major Francis Xavier (USAF), "Iran and Iraq: A Prediction for Future Conflict," Master's Thesis, Maxwell Air Force Base, AL: Air Command and Staff College, March 1997, pp. 13-16.

¹⁷ Brogan, *The Fighting Never Stopped*, p. 261.

¹⁸ "Iraq - Iraqi Offensives, 1980-82," Library of Congress Country Studies, <[http://lcweb2.loc.gov/cgi-bin/query2/r?frd/cstdy:@field\(DOCID+iq0102\)](http://lcweb2.loc.gov/cgi-bin/query2/r?frd/cstdy:@field(DOCID+iq0102))>, p. 1.

¹⁹ Ibid.

²⁰ Mike Eisenstadt, "The Sword of the Arabs: Iraq's Strategic Weapons," *Washington Institute Policy Papers*, No. 21 (Washington, D.C.: Washington Institute for Near East Policy, 1990), p. 9.

²¹ According to the last report issued by the United Nations Special Commission on Iraq (UNSCOM), Iraq admitted that its large-scale CW activities, to include the construction of production facilities and manufacture of related-equipment, the procurement of raw materials, and production and stockpiling of CW agents, were carried out from 1982 to 1990. See "Appendix II: Status of the Verification of Iraq's Chemical Weapons Programme," *Enclosure I/Report: Disarmament*, United Nations Security Council 2/1999/94, January 29, 1999, p. 56, <www.un.org/Depts/unscom/s99-94.htm>.

²² Ibid., p. 75.

²³ One example of the transfer of critical mustard agent precursors between Iraq and Western nations was detailed in a January 1989 *Washington Post* article. According to this report, in January 1989 the U.S. Customs Service announced the arrest of Nicholas Defino, a New Jersey resident and Frans Van Anraat, a Dutch citizen. Both individuals worked for Nu Kraft Mercantile Corporation (registered in Brooklyn, NY), and were charged with illegally exporting 400 tons of thiodiglycol to Jordan, which then was shipped to Iraq. These shipments were allegedly processed during 1987 and 1988. Peter Valentine, "2 Charged in Poison Gas Deal; Md Firm Linked to Export of Key Chemical to Mideast," *Washington Post*, January 31, 1989, p. A1.

²⁴ In 1984, a series of export-control incidents evidenced Iraq's interest in obtaining precursors for the production of nerve agents. In that year, the United States stopped shipment of 6.5 tons of potassium fluoride, and Iraqi orders to a Dutch company for 250 tons of phosphorus oxychloride, 200 tons of trimethyl phosphite, and 200 tons of potassium fluoride were never filled. Nevertheless, the Iraqis were successful in their efforts to acquire 60 tons of phosphorus oxychloride through the Dutch company Melchemie, which acquired it through the Italian company Motedisoin. Carus, *The Genie Unleashed*, note 9, p. 21.

²⁵ See "Appendix II: Status of the Verification of Iraq's Chemical Weapons Programme," p. 75.

²⁶ See Carus, *The Genie Unleashed*, pp. 11-15. Also, according to another analysis, under Iraq's Second Five-Year Plan (covering the years 1976-1980), a project called for the establishment of a production line at the Basra Petrochemicals-1 facility to manufacture 110,000 tons of ethylene per year. While in the commercial sector it has been used to make polyethylene plastics and other products, when mixed with air it forms an explosive mixture and thus can be used to create liquid rocket fuel and mustard gas. See Kenneth Timmerman, *The Death Lobby* (New York: Houghton Mifflin Company, 1991), pp. 35-36. Timmerman's book is also an excellent primer on the involvement of Western corporations and governments in assisting Iraq's pursuit of conventional and unconventional weapons capabilities from the 1970s to the eve of the Gulf crisis in 1990.

²⁷ Muthanna, also known as the State Enterprise for Pesticide Production, was located roughly 50 miles north of Baghdad and 25 miles southwest of Samarra. Prior to the damage inflicted upon it by coalition air strikes in the Gulf War, it had been described as the world's third largest chemical weapons production facility, with the ability to manufacture 2.5 tons of sarin and 5 tons of mustard agent per day. The facility itself was large—up to 25 square kilometers—and consisted of a network of production facilities, storage bunkers, and related support buildings. See Leonard Doyle, Donald Macintyre, and Tom Wilkie, "Saddam's Nerve Gas Secrets," *The Independent (London)*, August 4, 1991, p. 1.

²⁸ "Appendix II: Status of the Verification of Iraq's Chemical Weapons Programme," p. 74.

²⁹ "Iraq – The War of Attrition, 1984-87," Library of Congress Country Studies, <[³⁰ "CW Use in Iran-Iraq War," <\[http://www.gulflink.osd.mil/declassdocs/cia/19960702/070296_cia_72566_72566_01.html\]\(http://www.gulflink.osd.mil/declassdocs/cia/19960702/070296_cia_72566_72566_01.html\)>, p. 9.](http://lcweb2.loc.gov/cgi-bin/query2/r?frd/cstdy:@field(DOCID+iq0104)>, p. 1.</p>
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³¹ According to UNSCOM, Iraq admitted that it had produced 3,859 tons of CW agents from 1982 to 1990, and 3,315 tons were weaponized into delivery systems. Iraq then admitted that up to 80 percent of that weaponized inventory was used from 1982 to 1988, with an additional 130 tons of non-weaponized CW agents being discarded during that same time frame. After the Gulf War with Iraq, UNSCOM oversaw the destruction of 411 tons (295 tons mustard, 76 tons tabun, 40 tons sarin) of bulk CW agents. See "Appendix II: Status of the Verification of Iraq's Chemical Weapons Programme," pp. 66-67.

³² Carus, *The Genie Unleashed*, note 8, p. 21.

³³ "Task Force V Lessons Learned: The Iran-Iraq War," <http://www.gulflink.osd.mil/declassdocs/af/19961205/120596_aaday_01.html>, p. 2.

³⁴ Ibid., p. 2.

³⁵ "CW Use in Iran-Iraq War," <http://www.gulflink.osd.mil/declassdocs/cia/19960626/062596_cia_63704_63704_01.html>, p. 2.

³⁶ Terrill, "Chemical Weapons in the Gulf War," p. 53. A declassified U.S. intelligence report sheds some light on the issue of Iranian CW-protective gear and decontamination measures. According to the report, field decontamination of trenches and other contaminated areas was carried out with specially constructed equipment consisting of an apparatus comprised of two tanks mounted on a Toyota truck (one of the tanks contained powder, the other gas). Battlefield treatment of CW wounds was varied (blister agent victims were given effective aid, yet the nerve agent injectors were not as efficacious). Problems were encountered with gas masks and protective clothing, since donning such gear made movement in hot, humid areas like Khuzestan difficult (e.g., increased breathing and exertion, dehydration, fogging of masks due to increased perspiration, and loose-fitting masks due to beards). See "CW Use in Iran-Iraq War," <http://www.gulflink.osd.mil/declassdocs/cia/19960626/062596_cia_67222_67222_01.html>, pp. 2-3.

³⁷ "Task Force V Lessons Learned: The Iran-Iraq War," <http://www.gulflink.osd.mil/declassdocs/af/19961205/120596_aaday_03.html>, p. 1.

³⁸ Ibid., p. 1.

³⁹ Terrill, "Chemical Weapons in the Gulf War," pp. 53, 55.

⁴⁰ "Sale of Chemical Weapons to Iraq Denied," *London Press Association in English*, LD041455, March 4, 1984, in *Foreign Broadcast Information Service—Western Europe* (March 6, 1984), p. U1.

⁴¹ "Iraq Assails U.S. Accusation Over Use of Poison Gas," *New York Times*, March 7, 1984, p. 4; Henry Kamm, "New Gulf War Issue: Chemical Arms," *New York Times*, March 5, 1984, p. 1; "Iraq Reportedly Uses Mustard Gas in War," *Los Angeles Times*, January 26, 1984, p. 8; Seymour Hersh, "U.S. Aides Say Iraqis Made Use of a Nerve Gas," *New York Times*, March 30, 1984, p. 1; and "Is Baghdad Using Poison Gas?," *Newsweek*, March 19, 1984, p. 39.

⁴² "Chemical Weapons and the Iran-Iraq War: Department of State, March 5, 1984," *Department of State Bulletin*, No. 2085, April 1984, pp. 65-66.

⁴³ Terrill, "Chemical Weapons in the Gulf War," p. 55.

⁴⁴ Foroutan Abbas, "Report of the Specialists Appointed by the Secretary-General of the United Nations to Investigate Allegations by the Islamic Republic of Iran Concerning the use of Chemical Weapons," *Proceedings of the First World Congress*, p. 303.

⁴⁵ Peter Dunn, "The Chemical War: Journey to Iran," *NBC Defense & Technology International* (April 1986), p. 28.

⁴⁶ United Nations Security Council, Document S 16433, "Report of the Specialists Appointed by the Secretary General to Investigate Allegations by the Islamic Republic of Iran Concerning the Use of Chemical Weapons," March 26, 1984.

⁴⁷ Dunn, "The Chemical War," p. 35.

⁴⁸ "Iran-Iraq: Chemical Warfare Continues, November 1986," <http://www.gulflink.osd.mil/declassdocs/cia/19970409/970409_cia_9524_95224_01.html>, p. 7.

⁴⁹ "Iraqi Strategy and Tactics in the Use of Chemical Weapons During the Iran-Iraq War," <http://fas.org/irp/gulf/cia/960626/61709_01.htm>, p. 4.

⁵⁰ "Iraqi Air Force Capability to Deliver Chemical Weapons," <http://www.gulflink.osd.mil/declassdocs/dia/19961031/961031_950925_0422pgrtxt_90.html>, p. 2.

⁵¹ For a complete description of many of the munitions used by Iraq to deliver chemical agents against Iran, see Harvey J. McGeorge, "Iraq's Secret Arsenal," *Defense and Foreign Affairs Strategic Policy* (January/February 1991), p. 6. This report indicated that Iraq successfully employed mustard, sarin, and tabun with 250-kg bombs that employed both impact and airburst fuzes. Moreover, the report noted that Iraq employed blister and nerve agents on helicopter-fired 90mm air-to-surface rockets, 120mm mortars, 130mm and 155mm artillery shells, and 122mm multiple rocket launchers. Iraq also declared to UNSCOM that it expended 100,000 CW munitions (out of a total inventory of almost 200,000) from 1982-1988. See "Appendix II: Status of the Verification of Iraq's Chemical Weapons Programme," p. 57.

⁵² "Iraqi Chemical Warfare Data," <http://www.gulflink.osd.mil/declassdocs/cia/19970825/970613_cia_092596_ui_txt_0001.html>, p. 1.

⁵³ Dunn, "The Chemical War," p. 34.

⁵⁴ S.D. Feller, "Chemical Weapons – Theory & Practice," *War Studies Journal* (London: King's College, 1996), <<http://www.ocad.on.ca/dd/jul23-26/>>

winge/pages/pubchem.html>, p. 4.

⁵⁵ "Impact and Implications of Chemical Weapons Use in the Iran-Iraq War," p. 11, <http://www.fas.org/irp/gulf/cia/960702/72566_01.htm>.

⁵⁶ *Ibid.*, p. 14.

⁵⁷ The AG now has 30 member states, and during 1990 its mandate was expanded to include warning lists on the transfer of biological agents and dual-use production equipment. The list of chemical precursors on the AG warning list now stands at 54. The last major AG meeting occurred during October 2000 (the AG meets annually in Geneva). See "Australia Group," <http://www.state.gov/www/global/arms/bureau_np/000401_ag.html>.

⁵⁸ U.N. Security Resolution 582, S/RES/582 (1986), February 24, 1986.

⁵⁹ "Impact and Implications of Chemical Weapons Use in the Iran-Iraq War," p. 6.

⁶⁰ "Iraqi Strategy and Tactics in the Use of Chemical Weapons During the Iran-Iraq War," p. 2.

⁶¹ According to one source, Iraqi pilots could saturate three square kilometers by releasing four 100-kilogram bombs filled with sarin. See "Iraqi Use of Chemical Weapons in the War with Iran," <http://www.fas.org/irp/gulf/cia/960702/73922_01.htm>.

⁶² Dilip Hiro, *The Longest War* (New York: Routledge, 1991), p. 203.

⁶³ According to one report, by 1988 Iran had purchased close to 200,000 respirators from South Korea and Spain and atropine injectors from a Dutch firm. See "Special Report—Chemical and Biological Warfare Programmes," *Jane's Intelligence Review*, June 1, 1995, p. 15.

⁶⁴ Hiro, *The Longest War*, p. 201.

⁶⁵ Included in the Iranian chemical arsenal were blister agents such as mustard gas, choking agents such as chlorine and phosgene gas, and the blood agent hydrogen cyanide. These agents were delivered by artillery shells and aerial bombs. By the end of the war, Iran also was alleged to have a nerve agent (sarin and VX) production capability. See Andrew Rathmell, "Iran's Weapons of Mass Destruction," *Jane's Intelligence Review, Special Report 6* (1995), p. 17.

⁶⁶ Feller, "Chemical Weapons—Theory & Practice," p. 5.

⁶⁷ By this time, Iraq had extended the range of its Scud-Bs to twice their normal range of 190 kilometers, and during early March, Iraq had fired almost 50 missiles at cities in Iran, while Iran fired 25. See Cameron Hume, *The United Nations, Iran, and Iraq: How Peacemaking Changed* (Washington, D.C.: Georgetown University, 1994), p. 149.

⁶⁸ Brogan, *The Fighting Never Stopped*, p. 264.

⁶⁹ Some experts, notably the British microbiologist Christine Gosden, claim that Iraq used a "cocktail" of both chemical (mustard, nerve agents—sarin, tabun, and VX) and biological (possibly aflatoxin, a carcinogenic agent to which Iraq admitted producing 2,200 liters before the Gulf War in 1991) weapons in the Halabjah attack. See Christine Gosden, "Why I Went, What I Saw," *Washington Post*, March 11, 1998, p. A19.

⁷⁰ Doyle, MacIntyre, and Wilkie, "Saddam's Nerve Gas Secrets," p. 1.

⁷¹ In March 1995, Iran released a report asserting that up to 60,000 veterans of the Iran-Iraq War had been treated at the Kowsar Health Complex in Tehran to deal with the residual health effects from Iraqi CW attacks. See *Chemical Weapons Convention Bulletin* 28 (June 1995), p. 20. For a dramatic description of the effects of chemical weapons use on some Iranian combatants during the Iran-Iraq War, see Janny Scott, "Iranian Veterans Suffer Chemical Warfare's Chilling Effects," *Los Angeles Times*, January 25, 1991, p. A5.

⁷² According to one report, by late 1988 an assessment from the U.S. Central Intelligence Agency concluded that Iraq's use of chemical weapons against Iran was indeed the decisive factor in the conflict, and that the use of chemical weapons "drove Iran to the bargaining table." See Walker, "Iraq's Use of Chemical Arms Main Source of U.S. Fears."

⁷³ Hume, *The United Nations, Iran, and Iraq*, p. 168 (bold added for emphasis).

⁷⁴ U.N. Security Council Resolution 598 (1987), S/RES/598 (1987), p. 1.

⁷⁵ Hume, *The United Nations, Iran, and Iraq*, p. 151.

⁷⁶ *Ibid.*, p. 152.

⁷⁷ *Ibid.*, p. 153.

⁷⁸ *Ibid.*

⁷⁹ David Ottaway, "U.S. Decries Use of Chemical Weapons," *Washington Post*, March 24, 1998, p. A37.

⁸⁰ *Ibid.*, p. A37.

⁸¹ Hume, *The United Nations, Iran, and Iraq*, pp. 153-154.

⁸² Resolution 612 (1988), S/RES/1988, 9 May 9 1988, p. 1.

⁸³ Hume, *The United Nations, Iran, and Iraq*, p. 165.

⁸⁴ Resolution 620 (1988), S/RES/620/1988, 26 August 1988, p.1.

⁸⁵ For a thoughtful essay on this issue by a former Assistant Director to the (then) U.S. Arms Control and Disarmament Agency, see Thomas Etzold, "Timely Action on Chemical Weapons," *The Christian Science Monitor*, June 24, 1985, p. 14.