

**PREVENTIVE ATTACKS AGAINST
NUCLEAR, BIOLOGICAL, AND CHEMICAL
WEAPONS PROGRAMS:
THE TRACK RECORD**

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2006-8

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This working paper is one of several outcomes of the Ridgway Working Group on Preemptive and Preventive Military Intervention, chaired by Gordon R. Mitchell

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The September 2002 “National Security Strategy of the United States of America” (NSS 2002) declared a heightened risk of attack by “rogue states and terrorists” against the United States in the twenty-first century, potentially with nuclear, biological, or chemical (NBC) weapons. It stated, “To forestall or prevent such hostile acts by our adversaries, the United States will, if necessary, act preemptively.”¹ This doctrinal statement was used to justify the 2003 Iraq War, and may be used to justify future wars against countries such as Iran, North Korea, or Syria.

Will this strategy work? Will preventive/preemptive attacks provide enduring solutions to the threats posed by NBC proliferation? If they will, then even in the face of high costs they may be attractive policy options, given that NBC attacks against American interests are plausible and potentially catastrophic. If they will not, then their high costs and risks would counsel against launching such attacks.

To answer these questions, the working paper examines all 24 NBC preventive attacks which have occurred. The working paper divides the attacks into two categories, more limited preventive attacks which aimed to destroy NBC weapons and production facilities, and broader preventive attacks which aimed to disrupt NBC programs by overthrowing governments which possessed or sought to possess NBC weapons.

Analysis of past NBC preventive attacks yields two conclusions. First, limited attacks such as airstrikes almost never work, in that they rarely delay NBC programs significantly. Further, any minor successes in the past are not likely to be repeated in the future, as in anticipation of such attacks regimes are concealing and dispersing their NBC facilities. Second, attacks that change regimes might help remove NBC threats, though even when successful, war does not always change regimes durably. Further, the uncertain benefits of such wars must be weighed against very high costs. Resources might be more efficiently spent on counterproliferation and counterterrorism priorities other than preventive NBC regime change attacks.

This working paper contains six parts. The first section discusses and distinguishes between preemptive and preventive attacks. The second section briefly summarizes 24 past NBC preventive attacks. The third section assesses whether limited preventive strikes against NBC programs substantially delay the acquisition of NBC weapons. The fourth section examines NBC preventive attacks that culminated in regime change. The fifth section examines instances in which states considered launching preventive NBC attacks but did not, finding that in no case would a state have been better off launching such an attack. The final section concludes, weighing the costs and benefits of NBC preventive attacks.

PREEMPTIVE AND PREVENTIVE ACTION

The Bush doctrine makes reference to both “prevent[ion]” and acting “preemptively.” Preemptive and preventive attacks both anticipate future threats, the core logic being better to attack now than be attacked later. The critical distinction between them is the immediacy of the threat. Preemptive attacks respond to threats that are imminent, usually taking place in the context of an ongoing crisis, and preventive attacks respond to threats which are more distant, occurring when one side perceives that over the longer term, months or usually years, the enemy will grow steadily stronger.² Preventive attacks accept the certainty of war now in exchange for avoiding the possibility of a less favorable war in the future, meaning that in some sense, as Otto von Bismarck once put it, “Preventive war is like suicide from fear of death.”³ As a matter of history, preventive attacks are more frequent than preemptive attacks. Since 1816, there have been only three preemptive wars but more than 30 preventive wars.⁴ Though it uses the word preemptive, the Bush administration appears to be laying the groundwork for what is traditionally thought of as preventive. The preemption side is easier to justify, as an immediate threat more strongly indicates the imperative of an attack within decision-making circles and makes the attack more palatable as self-defense to both domestic and international audiences.⁵

Before the 2003 Iraq War, the United States generally avoided preventive attacks, making the 2002 National Security Strategy especially salient. Indeed, the United States launched no wars for purely preemptive or preventive motives from its founding up to 2003.⁶ The United States participated in some wars in response to direct attacks on American soil or forces (World War II, 2001 Afghanistan War), to protect American friends or allies (Vietnam, Korea, 1991 Gulf, arguably World War I), to protect human rights (arguably Spanish-American, Kosovo), to protect American commercial interests, especially at sea (War of 1812, Boxer Rebellion, World War I), and to expand American empire (arguably Spanish-American, Mexican). The US has also launched a number of attacks intended to overthrow anti-American governments (examples include Grenada and Panama), though none of those anti-American governments posed a threat anywhere near as direct or severe as that posed by an NBC-armed state.

HISTORICAL BACKGROUND ON NBC PREVENTIVE ATTACKS

Preventive strikes against NBC programs include any use of force which has the intention or effect of substantially degrading or delaying the acquisition of NBC weapons by a state or non-state actor. This is a very broad definition, but it permits compiling a long and inclusive list of NBC preventive attacks, which is an important task. To date no one has attempted to compile a list of NBC preventive attacks, and a first cut can best serve future scholarship by providing more raw data rather than confining the list at the outset.⁷ Further, even the apparently marginal cases offer lessons for drawing conclusions,

as for example the existence of a number of smaller attacks which failed to degrade substantially NBC programs demonstrates the difficulties of such missions. Intra-war cases are important, both because they offer lessons (such as the failure of massive strikes during the Gulf War because of Iraqi concealment and dispersion) and because intra-war preventive NBC strikes are possible in the future. Last, there are few costs to presenting a more inclusive list. There are no frequency or other statistical tests, meaning there is no risk of biasing the results by “artificially” increasing the size of the population. In total, there have been 24 instances of preventive strikes against NBC programs, grouped into eight clusters, and summarized in Table 1.

The first cluster includes five separate Allied attacks against the German nuclear weapons program during World War II. The Allies first sought to disrupt German heavy water production in Norway. A British raid in occupied Norway in autumn 1942 met with disaster when the commandos involved were all killed either upon crash landing or after capture by German troops. The Allies tried again with a February 1943 attack by Norwegian commandos, who successfully destroyed the heavy water production installation at Vermork. However, a Swedish report indicated that heavy water production might have recommenced as early as August, so the Allies followed up in November 1943 with a daylight bombing raid of 200 B-17s, which succeeded in permanently shutting down the plant. In a February 1944 follow-up mission, a single Norwegian commando destroyed the remaining stocks of German heavy water.⁸ Last, the D-Day invasion of Europe was in some sense a preventive attack against the German nuclear program, as a special Allied intelligence mission called Alsos sought out German nuclear scientists and facilities as Allied ground forces advanced across Europe. Alsos completely eliminated the German nuclear program in April 1945 when its operatives found and captured the German experimental atomic pile at Haigerloch and Werner Heisenberg’s laboratory at Heichingen.⁹

TABLE 1

PREVENTIVE ATTACKS AGAINST NBC PROGRAMS, 1942-2003.

<i>YEAR</i>	<i>ATTACKER</i>	<i>TARGET</i>	<i>ATTACK OBJECTIVE</i>
1942	British commandos	German nuclear program in Norway	Limited
1943	Norwegian commandos	German nuclear program in Norway	Limited
1943	Allied B-17s	German nuclear program in Norway	Limited
1944	Norwegian commando	German nuclear program in Norway	Limited
1945	Allied forces	German nuclear program	Regime change
1945	US aircraft	Japanese nuclear program	Limited
1945	Allied forces	Japanese NBC programs	Regime change
1979	Israeli agents	Iraqi nuclear program in France	Limited
1981	Israeli aircraft	Iraqi nuclear program	Limited
1980	Iranian aircraft	Iraqi nuclear program	Limited
1991	Iraqi Scuds	Israeli nuclear program	Limited
1991	Coalition forces	Iraqi NBC programs	Limited
1993	Coalition forces	Iraqi nuclear program	Limited
1998	Coalition forces	Iraqi NBC programs	Limited
2003	Coalition forces	Iraqi NBC programs	Regime change
1984	Iraqi aircraft	Iranian nuclear program	Limited
1985	Iraqi aircraft	Iranian nuclear program	Limited
1985	Iraqi aircraft	Iranian nuclear program	Limited
1986	Iraqi aircraft	Iranian nuclear program	Limited
1987	Iraqi aircraft	Iranian nuclear program	Limited
1987	Iraqi aircraft	Iranian nuclear program	Limited
1988	Iraqi aircraft	Iranian nuclear program	Limited
1998	US cruise missiles	al-Qaida chemical program in Sudan	Limited
2001	Coalition forces	al-Qaida NBC programs in Afghanistan	Regime Change

Note: All attacks took place on the target's homeland, unless otherwise noted.

The second cluster concerns the war against Japan in World War II. Japan pursued an atomic weapon during World War II, getting as far as uranium separation on a laboratory scale. The Japanese atomic bomb project was destroyed in an April 1945 bombing raid on Tokyo, though the US was unaware

of the program's existence.¹⁰ Aside from the atomic weapons program, Japan also had an active biological weapons program.¹¹ The entire war, culminating in a Japanese regime change, ended Japan's pursuit of biological weapons.

The third cluster includes two Israeli attacks and one Iranian attack against the Iraqi nuclear program. In April 1979, Israeli operatives detonated explosives at a French production facility near La Seyne-sur-Mer, damaging the cores of two nuclear reactors that were to be shipped to Iraq. In 1981, Israel launched an air strike against the Iraqi nuclear reactor at Osiraq, destroying the reactor dome.¹² Interestingly, shortly following the latter, Israel made an announcement which came to be known as the "Begin Doctrine" which, anticipating NSS 2002, stated that, "Under no circumstances would we allow the enemy to develop weapons of mass destruction against our nation; we will defend Israel's citizens, in time, with all the means at our disposal." Israel's public commitment to the Begin Doctrine waned by 1984, though some members of the Israeli military supported it into the mid-1990s.¹³ The 1981 Israeli attack followed a relatively unsuccessful September 1980 airstrike by two Iranian F-4 aircraft, which caused only minor damage.¹⁴

The fourth cluster includes Iraqi attacks on the Israeli nuclear reactor at Dimona during the 1991 Gulf War. Iraq launched six Scud missiles against Dimona, in retaliation for the 1981 Osiraq raid. None struck the reactor.¹⁵

The fifth cluster includes four American-led attacks on the Iraqi NBC program. The first of these was Operation Desert Storm in 1991, the primary aim of which was the liberation of Kuwait, though a secondary mission was the substantial disruption of Iraqi NBC facilities. During the war, some 970 strikes were conducted against NBC targets.¹⁶ The second attack was the January 1993 launch of some 44 cruise missiles against the Iraqi Zaa'faraniyah nuclear complex.¹⁷ The third was Operation Desert Fox, a 1998 wave of air strikes against Iraqi military and NBC targets launched in response to Iraqi refusal to meet its United Nations Special Commission on Iraq (UNSCOM) commitments.¹⁸ The last was Operation Iraqi Freedom, the 2003 invasion of Iraq motivated principally by the fear of an enduring threat from Iraqi NBC weapons.¹⁹

The sixth cluster concerns the Iranian nuclear program. With West German cooperation, Iran began construction of two nuclear reactors at Bushehr in 1974. The Shah started a small nuclear weapons program before being deposed; the new Khomeini regime appears to have at first abandoned the nuclear program, but then restarted it in the mid-1980s following Iraqi chemical weapons attacks. During the 1980-88 Iran-Iraq War, Iraq launched seven separate air strikes on Bushehr.²⁰

The seventh cluster is the August 1998 American missile attack against the al Shifa factory in Sudan. In response to terrorist bombings of American embassies in Africa, the Clinton administration decided to strike back against terrorist targets in Sudan and Afghanistan. The target in Sudan was a

factory which the American government believed secretly produced chemical weapons for Osama bin Laden's terrorist group, al-Qaida, believed to be responsible for the embassy attacks. The attack destroyed the factory, though the evidence that the factory produced chemical weapons and had links to bin Laden is weak.²¹

The eighth is the 2001 war in Afghanistan, in which American and coalition forces combined with opposition groups to overthrow the Taliban regime, which had allowed al-Qaida to maintain bases on Afghan territory. During the war, coalition forces elected not to bomb buildings suspected of housing chemical and biological weapons facilities.²² After the Taliban regime had been overthrown, facilities were discovered which al-Qaida might have used to produce NBC weapons. For example, British forces in spring 2002 discovered a centrifuge for liquid separation and an oven for drying slurried agents.²³ Documents pertaining to constructing dirty (radiological) bombs and nuclear weapons were also found.²⁴

LIMITED ATTACKS ON NBC PROGRAMS

Most preventive attacks on NBC programs are limited, intended only to destroy NBC weapons or production facilities. Such attacks can be greatly attractive to policy-makers, as they offer the promise of operational success at very low costs either in terms of friendly casualties or collateral damage. The limited nature of the attacks also means the geopolitical fallout is lesser than for broader regime change attacks.

Have such attacks worked? Have they substantially delayed or eliminated states' acquisition of NBC weapons? The record of success for limited attacks is weak. The limited attacks against the German nuclear program were insufficient; regime change was necessary to eradicate the program. The bombing raid against the Japanese nuclear laboratory inadvertently destroyed an embryonic program, though the overthrow of the Japanese government was necessary to terminate the biological weapons program. The missile strikes on Sudan likely did little damage to al-Qaida NBC capabilities, as the factory targeted likely did not produce chemical weapons as the Clinton administration claimed.

The limited American raids (1991, 1993, and 1998) on the Iraqi NBC program also inflicted relatively little damage. The 1993 raid was quite small, only a few dozen missiles. The 1998 Desert Fox raids were not trivial, comprising some 1000 aircraft sorties and cruise missile strikes against an array of targets. However, they caused only marginal damage to Iraqi NBC programs, because concerns for Iraqi civilian casualties encouraged coalition planners to avoid some targets, and more generally because of poor intelligence on target location.²⁵

The massive air strikes against Iraqi NBC programs during the 1991 Gulf War were in a narrow sense successful, in that they reached 75% of their targets. However, prewar intelligence provided an incomplete picture of the extent of the Iraqi NBC program, meaning that substantial Iraqi NBC assets

were left untouched. A General Accounting Office report declared that, “The goal of eliminating Iraq’s NBC capabilities was not even approximated by the air campaign; very substantial NBC capabilities were left untouched. An intelligence failure to identify NBC targets meant that the air campaign hit only a tiny fraction of the nuclear targets and left intact vast chemical and biological weapons stores.”²⁶ Specifically, though the attacks destroyed perhaps 75% of Iraqi chemical weapons production capability, they left standing substantial stocks of the weapons themselves, as 150,000 such munitions were discovered by United Nations inspectors in 1993. This failure rate is even more disturbing considering that the bulk of NBC strikes targeted chemical munitions capabilities.²⁷

The Iraqi biological weapons program also suffered only limited damage. The Department of Defense reported that though some facilities such as at Salman Pak and Al Kindi were destroyed, nearly all of the actual agent production equipment had been relocated, allowing Iraq to “easily renew production of biological agents when intrusive UN inspections are discontinued.”²⁸ Further, the actual biological weapons Iraq possessed during the war, several dozens of warheads and bombs equipped to deliver agents like botulinum and anthrax, were not destroyed.²⁹

The attacks also inflicted little damage on the Iraqi nuclear program. The 1981 Israeli raid on Osiraq had convinced the Iraqis to disperse, conceal, and harden their nuclear facilities, making them very difficult to find and destroy by 1991. Prewar intelligence substantially underestimated the scope of the program. The attacks destroyed only 15% of the program; many strikes hit empty buildings. A high-level defector reported that only three of the seven major Iraqi nuclear development sites were destroyed during Desert Storm. The conclusion of the official US government *Gulf War Air Power Survey* was that, “Measured against the goal of destroying enough of the Iraqi nuclear-weapons program to push an Iraqi nuclear weapon out to the end of the decade or beyond, the bombing was not effective. At best it forced the Iraqis to disperse and hide the visible elements of the program, thereby temporarily suspending production of enriched uranium.” One American who participated in the 1991 International Atomic Energy Agency (IAEA) postwar inspections of Iraq noted that the attacks at best “inconvenienced” the Iraqi nuclear program.³⁰

The 1981 attacks on the Iraqi Osiraq reactor are frequently portrayed as the prototype of a successful attack on an NBC program. The Israelis incurred no casualties, achieved operational success, and imposed a minimum of collateral damage. It has been argued that the strikes had a very real payoff, as Iraq might have used nuclear weapons against Iran during the Iran-Iraq War, and eventually might have used them against Israel. Further, some argue that because Iraq was in 1990 engaged in a crash program to develop a nuclear weapon which might conceivably have produced a weapon in as little as one year. Without the Osiraq attacks, Iraq might have completed a nuclear weapon before it invaded Kuwait, deterring any attempt to liberate Kuwait and introducing the risk of nuclear escalation in the event of war.³¹

The existing evidence indicates, however, that the benefits of the attack have been exaggerated.³² At the time of the attack, Iraq planned to produce plutonium (rather than enrich uranium) as a route to building a nuclear weapon. However, there were two impediments to Iraqi plutonium production. First, the French-provided reactor would have been subject to the inspection of both the IAEA and French technicians. The IAEA planned on sending an inspector as frequently as every two weeks, and it would likely have installed cameras for constant surveillance before the reactor became operational. French inspectors, on site continuously, would have filed daily reports.³³ Notably, the Iraqis had plans to defeat the cameras and elude the on-site inspections.³⁴ However, it is uncertain whether such plans would have succeeded. The French technicians were likely opposed to Iraqi acquisition of nuclear weapons; there is indirect evidence that they knew beforehand of the Israeli air strike, and they may have even assisted the strike by providing intelligence to the Israelis.³⁵ The French technicians, then, would have been highly motivated to report any illegal weapons activity. Further, plutonium production is extremely difficult to conceal, both because the procedures require shutting down the reactor to insert and withdraw the uranium rods and because the transportation devices which move the plutonium-producing uranium targets cannot be hidden. In short, these activities could “hardly escape observation by the French technicians, visiting International Atomic Energy Agency inspectors, or the IAEA’s permanent surveillance cameras at the site.” Importantly, the Iraqis were dependent on the French for reactor fuel, so discovery of secret plutonium production and diversion would likely have shut the reactor down.³⁶ Imad Khadduri, a former Iraqi nuclear physicist, agreed with this assessment, noting, “The possibility of such an undertaking by Iraq is delusional. The tight refueling schedule for such an endeavor, which is required to prevent ‘poisonous’ plutonium 238 from developing, would be impossible to hide from the French scientists who would have been collaborating with us for years and the IAEA inspectors. Had we even diabolically thought of kicking both out and running the reactors ourselves for such a purpose, the limited fresh fuel that was allowed for us would have aborted any such attempt at the outset.”³⁷

Second, inspections aside, there were physical barriers. The reactor itself was a light water moderated reactor, meaning that it was not designed for efficient plutonium production, rather than a gas-graphite reactor, a more efficient plutonium producer. Further, the French had originally promised to supply 80% enriched fuel, but in 1980 they unilaterally renegotiated the terms, declaring they would instead supply 18% “caramel” fuel to block the production of weapons grade plutonium. The Iraqis at first refused the caramel fuel, but by 1981 the French held firm and declared they would only supply the lower grade caramel fuel to a rebuilt reactor. Khadduri noted that, “Neither would the unique design of the reactor core for the ‘Caramel’ fuel allow for fuel designs specific for plutonium production.” In the opinion of an American physicist who inspected the site, under the best conditions (including assuming

that all inspection measures were evaded) the reactor might have given them a one year advantage in a ten year program to make atomic bombs.³⁸

Interestingly, Khadduri has gone so far as to claim that the Osiraq attack actually initiated Saddam's efforts to acquire an atomic bomb.³⁹ The veracity of this claim is uncertain; another Iraqi nuclear defector, Khidhir Hamza, had been working on building on an Iraqi nuclear weapon since the early 1970s, and was specifically and directly ordered by Saddam in 1979 to build such a device.⁴⁰ However, Khadduri does make the interesting point that Jafar Dhia Jafar, a leading Iraqi nuclear scientist arrested and tortured in 1979 for suspicion of collaboration with the political opposition, was rehabilitated and sent to work on the atomic bomb after the Osiraq attack, evidence that the Osiraq attack may have accelerated if not initiated the Iraqi nuclear program. Other observers also speculate that the Osiraq attack may have increased Saddam's commitment to acquiring a nuclear weapon.⁴¹ Hamza has claimed that after the attack, Saddam increased by more than fifteen times the number of scientists devoted to and the amount of money spent on the nuclear weapons.⁴²

Only under the most generous assumptions, in which the Iraqis eluded for a decade detection of illegal weapons-related activity in a publicly known reactor under the gaze of cameras, daily inspections from French technicians, and perhaps biweekly onsite inspections from the IAEA, and overcame technical limitations inherent to their reactor and fuel, can we project that Iraq might have had an atomic bomb by 1991. Regardless, it is unlikely that that "success" could be replicated. The central lesson of Osiraq for Iraq and other potential proliferants is to keep the location of nuclear facilities secret, lest they attract attacks. The 1981 attack changed the approach of the Iraqi program away from plutonium production and towards uranium enrichment, ironically helping Iraq conceal its program, as it could feign the complete destruction of its nuclear program while still pursuing uranium enrichment secretly. This shift to secrecy is one important reason why the Gulf War coalition underestimated the scope of the Iraq nuclear program in 1991 and why its intelligence on the locations of Iraqi nuclear facilities was scarce and incomplete, leading to a largely unsuccessful attack against Iraqi NBC assets.⁴³ Other nations learned this same lesson. One factor leading the Air Force to oppose air strikes against the North Korean nuclear program in 1993 was doubt about whether intelligence about the location of North Korean nuclear facilities was complete.⁴⁴ These difficulties have persisted; in 2003, a former Pentagon official commented that "Taking out the one facility at Yongbyon with cruise missiles does not shut down the North Korean nuclear program—it's not like Osiraq in Iraq. They may have one to two weapons and a clandestine highly enriched uranium program."⁴⁵ Iran has likely concealed and dispersed enough of its nuclear facilities such that a preventive air strike against its facilities would at best marginally delay its nuclear program.⁴⁶

The series of Iraqi attacks on Iranian nuclear facilities during the 1980s are in some ways comparable to the 1981 Israeli attack on Osiraq. They also sought the destruction of an embryonic nuclear program, and ultimately achieved operational success, as they inflicted major damage on the Bushehr site; these attack. Absent the attacks the reactor might have been completed by 1990, and in the wake of the attacks the reactor has not yet been completed.⁴⁷

Interpreting the Iraqi attacks on Bushehr as successful deserves qualification, however. Drawing inferences about the extent of the damage or even the nature of the Iranian program (including the intensity of Iranian commitment to acquiring nuclear weapons) in the 1980s and 1990s is difficult, as there are “serious gaps in the historical flow of evidence,” according to one expert.⁴⁸ The fact that Iraq engaged in several attacks across a span of years indicates that the first attacks may have been operationally unsuccessful. More importantly, Bushehr itself may have had only limited importance for the Iranian nuclear weapons program. Like the Osiraq reactor, Bushehr was subject to IAEA inspection, meaning that diversion of plutonium or enriched uranium for a weapon would have been at best difficult; the reactor also relied on foreign technicians and foreign sources of reactor fuel. It was also a light water reactor, poorly designed for plutonium production, and it was to be fueled with three percent enriched uranium, “totally unsuited as weapons fuel.” Interestingly, though the Bushehr reactor is still not completed, international concern about Iranian proliferation is higher than ever, because of fears both of secret facilities and known facilities such as Esfahan, Aran, and Natanz.⁴⁹

In sum, limited strikes against NBC programs have a very poor record of performance. In even the best examples of such attacks, the 1981 Osiraq raid and the 1980s Iraqi attacks on Bushehr, the net delays of the targeted nuclear programs were minimal. Notably, future attacks will get no easier, as proliferants will likely conceal and disperse their NBC facilities, making limited attacks even less likely to succeed. Last, fear that such attacks would release chemical or biological agents or nuclear radiation into civilian areas may constrain the US from launching comprehensive airstrikes. This concern limited the 1998 Desert Fox attacks, and was one of many factors constraining American decision-makers from launching preventive strikes against North Korean nuclear facilities in 1994.⁵⁰

REGIME CHANGE ATTACKS ON NBC PROGRAMS

There are four cases of preventive NBC attacks which culminated in regime change, Germany 1945, Japan 1945, Afghanistan 2001, and Iraq 2003. It is still too early to judge whether regime change preventive attacks in the latter two cases have provided long-term inoculation against NBC programs. Regarding the Afghan War, though, experts are doubtful that all of al-Qaida’s NBC production facilities were located in Afghanistan, meaning that even under the best case scenario of al-Qaida and the Taliban being permanently removed from Afghanistan by a peaceful and pro-American Afghan government, the

al-Qaida NBC threat remains.⁵¹ The Iraq case is odd, in that denuding Iraq of NBC may be trivial given its substantial disarmament before the war began.

The German and Japanese cases are more interesting, however. In both cases, defeat effectively eliminated militarism, and neither country has acquired NBC in the decades since. However, speculation about replicating the German and Japanese experiences must confront two sets of concerns. First, facilitating these transitions has been hugely costly. It required gigantic amounts of economic aid to both countries, and the stationing of hundreds of thousands of troops abroad for a half-century. The Cold War provided a political context in which the American public supported expenditures of hundreds of billions of dollars on these missions. Any future preventive attacks must be discussed in the context of the long-term commitment of resources, and (as discussed below) whether there might be more efficient ways of spending resources to reduce terrorism and NBC proliferation.

Second, there were a number of conditions that lined up in both Germany and Japan to favor success that may not be present elsewhere.⁵² Both countries enjoyed relative ethnic heterogeneity, meaning that the lifting of totalitarian government did not encourage ethnic subgroups to fight each other or secede, as in Lebanon or Yugoslavia. Most importantly, there was general harmony between what needed to be done to democratize and demilitarize these nations, what the occupation forces wanted to do, and what the people wanted.⁵³ Notably, when a society does not demand demilitarization and democratization, regime change may not cure a state of militarism or NBC in the medium or long term, the collapse of Germany's Weimar Republic serving as an ominous warning.

More generally, structural factors, such as low per capita income, a reliance on oil or mineral exports, being surrounded by non-democratic states, and lacking a strong civil society, may impede successful democratization.⁵⁴ Some have speculated that cultural factors impede democracy, noting the absence of democracy in the Arab world and the low incidence of democracy in the Muslim world.⁵⁵ Possible targets of future NBC preventive attacks experience one or more of these factors. Iran is oil-dependent, Muslim, and resides in a non-democratic region, and North Korea is quite poor and has essentially no civil society. This does not mean that democratization is impossible in these nations, but it does mean that external intervention should not be seen as a guarantee of successful regime change towards either democracy or even a pro-American regime. The American experience in the Western hemisphere provides ample evidence for caution, where the occasional intervention which has successfully implanted an enduring democracy (such as in Panama in 1989) must be compared to an array of failures (such as interventions in Haiti and the Dominican Republic).⁵⁶ Attempts by the UN in the 1990s to democratize through peacebuilding missions has enjoyed only very spotty success, sometimes failing catastrophically in places like Angola and Rwanda.⁵⁷ As noted, it is too early to declare success or failure in the democratization efforts in Iraq and Afghanistan, though it is probably safe to say that in

2005 Iraq looks worse than either Germany or Japan looked in 1947, and Afghanistan looks worse than either Germany or Japan looked in 1949. Importantly, a failed attempt to implant democracy can mean disaster, drawing in more and more American troops and economic resources without establishing stable governance. Such failures may also undermine the war on terror, by making American troops attractive targets for attacks and by producing “failed state” environments in which terrorist groups can recruit and establish training facilities.

OPPORTUNITIES MISSED? PREVENTIVE ATTACKS THAT DID NOT OCCUR

The discussion thus far has focused on NBC preventive attacks that have occurred, examining whether or not they have worked. Conversely, have there been instances in which in hindsight a state should have attacked another state that possessed or was developing NBC? There certainly have been a number of opportunities. The United States considered launching NBC preventive attacks against the Soviet Union in the 1950s and early 1960s, against China in the early 1960s, against Cuba during the Cuban Missile Crisis and against North Korea in the 1990s.⁵⁸ Elsewhere, India considered launching preventive attacks against Pakistan’s nuclear program in the 1980s, the Soviet Union considered attacking China’s nuclear program in 1969, and Egypt considered attacking Israel’s Dimona nuclear reactor in the 1960s.⁵⁹

Should any of these governments have attacked? Would the benefits have exceeded the costs? In every case in which a nation considered but did not launch an attack, even if one assumes that such an attack would have been operationally successful (an uncertain assumption given the low success rate of those attacks which have actually occurred), that state was better off not attacking. In no case did a potential target acquire NBC and then use them against the potential attacker. Further, in some cases the costs of would have been exorbitant, killing millions.

Consider the specific cases. The United States considered launching preventive attacks against the Soviet Union in the late 1940s and early 1950s, but even as the Soviet Union attained full nuclear parity, neither it nor its allies attacked the US or its principal allies. Ultimately, internal political change within the Soviet Union transformed Soviet and Cold War politics, reducing the nuclear threat to essentially zero. Had the United States attacked the Soviet Union, this would have meant the deaths of tens of millions.

The US also considered launching preventive attacks, either airstrikes or a ground invasion, against Cuba during the Cuban Missile Crisis. The attacks, of course, proved unnecessary, as the missiles were voluntarily removed in exchange for minimal American concessions, a commitment not to invade Cuba and the removal of obsolete missiles in Turkey. Importantly, the costs of an attack on Cuba were underestimated at the time and could have been extraordinary. When the naval blockade began, most of

the intermediate range missiles and their respective warheads were in Cuba and nearly operational,⁶⁰ raising the possibility that attacks against the missiles would have put the Soviets and Cubans in a “use them or lose them” situation, perhaps encouraging their use if they came under attack. Additionally, a ground invasion might have invited nuclear escalation through the use of Soviet nuclear torpedoes against American aircraft carriers, or the use of Soviet short-range nuclear missiles against landing American troops.⁶¹

Averting an American preventive attack against China in the early 1960s also proved to be wise. Since 1960, China has not attacked the US or any American ally; a preventive attack would have “solved” a problem which never appeared. Occasional belligerent moves like the 1996 missile tests were effectively contained with deterrent moves.⁶² Further, China has evolved into being a strategic asset, through Nixon’s rapprochement, integration of China into the world economy, and inclusion of China in confronting international issues like North Korea. A preventive attack would have foreclosed these strategic and economic benefits, to say nothing of the massive civilian casualties.

A preventive attack against North Korea has (thus far) proven unnecessary. North Korea has not attacked its neighbors since 1953. Conversely, the costs of war in Korea might have been exorbitant: a half million casualties in the first ninety days, up to a million military and civilian casualties including as many as 100,000 American dead, financial costs of \$100 billion for the war effort, and regional economic costs of a trillion dollars.⁶³ A more limited airstrike against North Korean nuclear facilities is not a more attractive option, both because of concealment and dispersion of North Korean nuclear facilities, and because of the possibility of North Korean retaliation in reaction to even a limited airstrike. Secretary of Defense William Perry worried about this possibility, and General Gary Luck declared, “If we pull an Osirak, they will be coming south.” One high level North Korean defector estimated that the chances of a limited attack escalating to a general war to be about 80%. North Korean options for retaliation ranged from launching artillery barrages to attacking South Korean nuclear power plants to invading South Korea.⁶⁴

Other NBC preventive attacks would have been similarly foolish. A Soviet preventive attack against Chinese nuclear facilities would have been gigantically destructive and was ultimately unnecessary, as there were no clashes after the attack was considered in 1969. An Egyptian attack on Israeli nuclear facilities in the 1960s would have been fruitless, as Israeli nuclear weapons had little bearing on Egyptian-Israeli relations. The continued development of the Israeli nuclear program did not deter Egyptian attacks in 1969 or 1973, nor did it stop the Israeli-Egyptian peace agreements in the 1970s, agreements which greatly served Egyptian interests by returning the Sinai Peninsula to Egypt and solidifying American support.⁶⁵ Lastly, India is better served for foregoing preventive attacks against the Pakistani nuclear program. A principal reason India forewent such an attack is that Indian military leaders

could not guarantee that Indian cities could be protected from conventional or even nuclear attacks from Pakistan, and a nuclear war between the two countries could have killed several millions.⁶⁶ More importantly, the successful elimination of Pakistan's nuclear weapons would not have improved Indian security, as an Indian nuclear monopoly did not translate into diplomatic advantage in the 1970s and 1980s, and after going nuclear Pakistan did not extract concessions on Kashmir or other issues with its nuclear sabre.

WEIGHING THE MERITS OF NBC PREVENTIVE ATTACKS

The historical record of preventive attacks against NBC programs is not very encouraging. Limited attacks short of imposing regime change have been quite unsuccessful at eliminating NBC programs. The episode most often cited as successful is the 1981 Osiraq attack, though close analysis reveals that this attack at most delayed the Iraqi nuclear program marginally. Significantly, the lessons of Osiraq to conceal and disperse NBC facilities learned by potential targets make it unlikely that such attacks will succeed in the future.

Importantly, the costs of preventive attacks may be paid to destroy NBC programs that do not exist, will not succeed, or are years or decades away from completion. The attacks against German heavy water production in World War II were ultimately successful, but heavy water itself is a dead end in bomb design.⁶⁷ The 1998 missile strikes against Sudan may have destroyed a factory with no connection to the production of chemical weapons. Estimates of the Iraqi NBC program just prior to the 2003 war as well as Iraq's connections to terrorist groups were substantially exaggerated.⁶⁸ More generally, the difficulties of intelligence collection on NBC programs are detailed in Greg Thielmann's working paper in this volume. Rodger Payne's working paper lays out the failures of the public debate to assess accurately Iraq's NBC capabilities before the 2003 Iraq War.

Fortunately, there are sound, cost-effective alternatives to preventive attacks that address NBC proliferation; in his working paper in this volume, William Hartung lays out "preventive diplomacy" as an alternative. Most centrally, deterrence is a proven, successful policy. The United States has successfully deterred a number of nuclear-armed, anti-American dictators from using NBC weapons. Soviet, Chinese, and North Korean leaders all refrained from using nuclear weapons in the context of an American promise of retaliation. Iraq elected to launch conventionally-armed rather than NBC-armed Scud missiles against Israeli cities during the Gulf War in part because of fears of Israeli and American retaliation.⁶⁹ Significantly, the United States successfully deterred Iraq in the 1990s from launching further aggression, and probably could have deterred Iraq into the future without launching a preventive attack.⁷⁰

An important shortcoming of deterrence, however, is that it is substantially less effective against terrorists than against governments. Probably the most prudent scenario for an NBC preventive attack

would be some repetition of the 2001 Afghanistan War, where the goal is to overthrow a regime widely known to support potentially NBC-armed terrorists, where the regime is vulnerable to American military action, where the regime is generally hated within the country (increasing the likelihood of transition to a pacific, democratic regime which will cooperate in the war on terror) and internationally (to reduce anti-American backlash), and where the military action is multilateral (defusing anti-Americanism and enabling burden-sharing). However, policy-makers must be careful before seeking to replicate the Afghanistan experience. The Taliban and al-Qaida have as of autumn 2005 not been eradicated from Afghanistan and the nation is nowhere near being a stable democracy. Indeed, two central lessons of Afghanistan are that the costs of (re)building government and society should not be underestimated and that a long-term and sustained commitment will be needed. We do not at this point know if Afghanistan will slide back into the kind of failed state environment which permits terrorist groups to thrive. Further, in a narrow sense the Afghan War may have advanced the war on terrorism, but had less of an effect on the dangers of NBC proliferation, as al-Qaida NBC operations were not primarily based in Afghanistan.

Deterrence aside, international diplomacy coupled sometimes with internal political change has proven to be a surprisingly successful means by which states have completely and permanently abandoned NBC programs. By one count, some 22 countries have tried to attain or have attained nuclear weapons but have abandoned their attempts (or programs) without preventive attacks.⁷¹ These efforts have meant substantial nonproliferation success since the 1960s, when it was feared that by 2000 dozens of nations would have gone nuclear. Economic sanctions, internal political changes, and reduction in international threat pushed South Africa to abandon its nuclear program. Sanctions also pushed Libya to abandon its NBC programs, and the combination of sanctions and international inspections were very effective in stripping Iraq of its NBC programs in the years before the 2003 attack.⁷² The collapse of the Soviet Union created three nuclear states, Ukraine, Belarus, and Kazakhstan, and all three gave up their existing nuclear arsenals with international pressure, guidance, and incentives. Argentina and Brazil both abandoned their nuclear programs because of internal changes and international pressures.

Lastly, NBC preventive attacks have significant costs, even if one's only goals are fighting terrorism and NBC proliferation. The Iraq War has increased global anti-Americanism and terrorist recruitment.⁷³ Even a limited attack against Iranian nuclear facilities would likely stimulate Iranian support for anti-American terrorism. The CIA reported in 2004 that Hezbollah "would react to an attack against it, Syria, or Iran with attacks against U.S. and Israeli targets worldwide."⁷⁴

From a material perspective, to reduce NBC and terrorism risks the resources spent on preventive attacks could be spent more effectively elsewhere. Peter Dombrowski nicely lays out the demands the 2002 NSS will make of US military capabilities in Working Paper nine of this volume. More specifically, according to one August 2004 analysis, the \$144.4 billion spent on the Iraq War (then; the figure is now

in the hundreds of billions) could be spent much more effectively on other counterproliferation and counterterrorism programs, including \$7.5 billion to safeguard American ports, \$4 billion to modernize the Coast Guard, \$2 billion for better cargo security, \$10 billion to defend airliners from surface-to-air missiles, \$240 million for machines to detect explosives on passengers at airports, \$7 billion for another 100,000 police officers, \$2.5 billion to aid fire departments, \$350 million to integrate police, fire and other emergency radio networks, \$3 billion to improve security on roads and railways, \$30.5 billion to secure nuclear materials in the former Soviet Union and elsewhere, \$2.25 billion to accelerate the deactivation of 6,000 nuclear warheads through the Nunn-Lugar initiative, \$24 billion to create two new Army divisions, \$15.5 billion to double the number of active Special Forces troops, \$8.6 billion to rebuild Afghanistan, \$11 billion to convert Afghan crops away from opium (which finances terrorist operations), \$10 billion to increase foreign aid, and \$775 million to increase public diplomacy efforts in Arab and Muslim states.⁷⁵

In sum, future opportunities for NBC preventive strikes must be evaluated with great caution. Limited strikes, though lower in cost, are extremely unlikely to work, especially because targets will probably conceal and disperse their NBC facilities. Larger campaigns which successfully change regimes can nullify an NBC threat, though successful regime change and democratization are not easy tasks, and even operational success against one state may increase NBC and terrorism threats if the costs are inflaming anti-Americanism and drawing off funds from other critical priorities.

¹ United States, White Office of Homeland Security, “The National Security Strategy of the United States of America,” September 2002, <<http://www.whitehouse.gov/nsc/nss.html>>.

² Dan Reiter, “Exploding the Powder Keg Myth: Preemptive Wars Almost Never Happen,” *International Security* 20 (Fall 1995): 5-34. Stephen Van Evera distinguished the two slightly differently, declaring that a state attacks preemptively if it believes that striking first offers a military advantage, whereas a state attacks preventively if its opponent is gaining in relative power. See Stephen Van Evera, *The Causes of War: Power and the Roots of Conflict* (Ithaca, NY: Cornell University Press, 1999), 40n.

³ Quoted in Jack S. Levy, “Declining Power and the Preventive Motivation for War,” *World Politics* 40 (October 1987): 103.

⁴ Reiter, “Powder Keg”; Douglas Lemke, “Investigating the Preventive Motive for War,” *International Interactions* 29 (October-December 2003): 273-292. On the causes of preventive wars, see Robert Powell, *Bargaining in the Shadow of Power* (Princeton, NJ: Princeton University Press, 1999); Van Evera, *Causes of War*; Dale C. Copeland, *The Origins of Major War* (Cornell: Cornell University Press, 2000); Levy, “Declining Power”; *Parity and War*, ed. Jacek Kugler and Douglas Lemke (Ann Arbor: University of Michigan, 1996); and Richard Ned Lebow, “Windows of Opportunity: Do States Jump through Them?” *International Security* 9 (Summer 1984): 147-186. For a formal model of the decision to launch an NBC preventive strike, see Peter D. Feaver and Emerson M. S. Niou, “Managing Nuclear Proliferation: Condemn, Strike, or Assist?” *International Studies Quarterly* 40 (June 1996): 209-234.

⁵ Ivo Daalder and James M. Lindsay, *America Unbound: The Bush Revolution in Foreign Policy* (Washington: Brookings, 2003), 127; Noam Chomsky, *Hegemony or Survival: America’s Quest for Global Dominance* (New York: Metropolitan Books, 2003), 12. See also the working papers by G. Thomas Goodnight and Tom Rockmore in this volume.

⁶ For a dissenting view, see John Lewis Gaddis, *Surprise, Security, and the American Experience* (Cambridge: Harvard University Press, 2004). For a discussion of the Cold War roots of the 2002 NSS, see the Ridgway working paper in this series by Gordon Mitchell and Robert Newman.

⁷ For a partial list, see Robert S. Litwak, “The New Calculus of Pre-emption,” *Survival* 44 (Winter 2002-2003): 53-80.

⁸ Richard Rhodes, *The Making of the Atomic Bomb* (New York: Simon and Schuster, 1986), 455-457, 513-517; Thomas Powers, *Heisenberg’s War: The Secret History of the German Bomb* (New York: Knopf, 1993), 211-212.

⁹ Powers, *Heisenberg’s War*, esp. 263-269; 421-424.

¹⁰ Rhodes, *Making of the Atomic Bomb*, esp. 612.

¹¹ Yuki Tanaka, *Hidden Horrors: Japanese War Crimes in World War II* (Boulder, Colo.: Westview, 1996), 139-140.

¹² Khidhir Hamza with Jeff Stein, *Saddam’s Bombmaker* (New York: Touchstone, 2000), 109, 129.

¹³ See Shai Feldman, *Nuclear Weapons and Arms Control in the Middle East* (Cambridge: MIT Press, 1997), 109-110. See also Zeev Maoz, “The Mixed Blessing of Israel’s Nuclear Policy,” *International Security* 28 (Fall 2003): 64n.

¹⁴ Rebecca Grant, “Osirak and Beyond,” *Air Force Magazine* 85 (August 2002), <<http://www.afa.org/magazine/aug2002/0802osirak.asp>>; Rodger W. Claire, *Raid on the Sun: Inside Israel’s Secret Campaign That Denied Saddam the Bomb* (New York: Broadway Books, 2004), 119-120.

¹⁵ Mohammad-Mahmoud Mohamedou, *Iraq and the Second Gulf War: State Building and Regime Security* (San Francisco: Austin and Winfield, 1998), 159. There is only sketchy evidence that Dimona was targeted. Mohamedou appears to have drawn this conclusion on the basis of interviews with Iraqi government officials.

¹⁶ Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey Summary Report* (Washington, DC: Government Printing Office, 1993), 80.

¹⁷ Daniel L. Byman and Matthew C. Waxman, *Confronting Iraq: U.S. Policy and the Use of Force Since the Gulf War* (Santa Monica, California: RAND, 2000), 52.

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- ¹⁸ Byman and Waxman, *Confronting Iraq*.
- ¹⁹ Bob Woodward, *Plan of Attack* (New York: Simon and Schuster, 2004).
- ²⁰ David Albright and Corey Hinderstein, "Iran, Player or Rogue?" *Bulletin of the Atomic Scientists* 59 (September/October 2003): 52-58; Andrew Koch and Jeannette Wolf, "Iran's Nuclear Facilities: A Profile," Center for Nonproliferation Studies, 1998 <<http://www.cns.miis.edu>>; Anthony H. Cordesman, *Iran and Iraq: The Threat from the Northern Gulf* (Boulder: Westview, 1993, 105).
- ²¹ James Risen, "Question of Evidence: A Special Report," *New York Times*, 27 October 1999, A1; Peter L. Bergen, *Holy War Inc.: Inside the Secret World of Osama bin Laden* (New York: Free Press, 2001), esp. 123-125; and Litwak, "New Calculus."
- ²² James Risen and Judith Miller, "Al Qaeda Site Points to Tests of Chemicals," *New York Times*, 11 November 2001, A1.
- ²³ Judith Miller, "Threats and Responses: Terrorist Weapons," *New York Times*, 13 September 2002, A5; Jack Boureston, "Strategic Insight: Assessing al Qaeda's WMD Capabilities," Naval Security Affairs Department/Center for Contemporary Conflict, September 2002, <<http://www.ccc.nps.navy.mil/rsepResources/si/sept02/wmd.asp>>.
- ²⁴ Woodward, *Plan of Attack*, 46.
- ²⁵ Byman and Waxman, *Confronting Iraq*, 68-70.
- ²⁶ United States, General Accounting Office, "Operation Desert Storm: Evaluation of the Air Campaign," GAO/NSIAD-97-134, June 1997, Appendix III 9.2.5, <<http://www.fas.org/man/gao/nsiad97134/index.html>>.
- ²⁷ US GAO, "Operation Desert Storm"; Keaney and Cohen, *Gulf War*, 80-81.
- ²⁸ United States, Department of Defense, "Proliferation: Threat and Response," April 1996, <<http://www.iraqwatch.org/government/US/Pentagon/dod-prolif-1996.htm>> (2 August 2004). See also Keaney and Cohen, *Gulf War*, 82. This portrayal is confirmed by the testimony of Saddam's son-in-law, who defected to Jordan in 1995. See UNSCOM/IAEA interview with General Hussein Kamal, Amman, Jordan, 22 August 1995, <<http://www.iraqwatch.org/un/UNSCOM/unmovic-kamalmeeting-082295.pdf>>.
- ²⁹ Judith Miller, Stephen Engelberg, and William Broad, *Germes: Biological Weapons and America's Secret War* (New York: Simon and Schuster, 2001), esp. 187.
- ³⁰ General Accounting Office, "Operation Desert Storm," Appendix III 9.2.5.; Hamza, *Saddam's Bombmaker*, 258; Barry D. Watts and Thomas A. Keaney, *Gulf War Air Power Survey, Volume 2: Operations and Effects and Effectiveness, Part II: Effects and Effectiveness* (Washington: US Government Printing Office, 1993), 312-345, quote from p. 345; Keaney and Cohen, *Gulf War*, 115; and Feldman, *Nuclear Weapons*, 136.
- ³¹ Shlomo Nakdimon, *First Strike: The Exclusive Story of How Israel Foiled Iraq's Attempt to Get the Bomb*, trans. Peretz Kidron (New York: Summit Books, 1987), 336; United States, Central Intelligence Agency, "Prewar Status of Iraq's Weapons of Mass Destruction," March 1991, <<http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB80/wmd04.pdf>>; Kenneth M. Pollack, *The Threatening Storm: The Case for Invading Iraq* (New York: Random House, 2002), 369; and Jeremy Tamsett, "The Israeli Bombing of Osiraq Reconsidered: Successful Counterproliferation?" *Nonproliferation Review* 11 (Fall/Winter 2004): 70-85.
- ³² See Dan Reiter, "Preventive Attacks Against Nuclear Programs and the 'Success' at Osiraq," *Nonproliferation Review* 12 (July 2005): 355-371.
- ³³ Lucien S. Vandenbroucke, "The Israeli Strike Against Osiraq," *Air University Review* 35(September-October 1984): 35-47; Richard Wilson, "A Visit to the Bombed Nuclear Reactor at Tuwaitha, Iraq," *Nature* 301 (March 31, 1983): 376.
- ³⁴ David Albright and Khidhir Hamza, "Iraq's Reconstitution of its Nuclear Weapons Program," *Arms Control Today* 28 (October 1998): 9-15. Saddam also planned to elude inspections by building a secret copy of the French-provided reactor, though whether such a facility could have been built and enough plutonium for a bomb produced by 1991, in secret, is unknown. Hamza, *Saddam's Bombmaker*, 120.
- ³⁵ Hamza, *Saddam's Bombmaker*, 129-130.

- ³⁶ Vandenbroucke, "Israeli Strike"; Anthony Fainberg, "Osirak and International Security," *Bulletin of the Atomic Scientists* 37 (October 1981): 34; H. Gruemm, "Safeguards and Tamuz: Setting the Record Straight," *IAEA Bulletin* 23 (December 1981): 10-14; and Christopher Herzig, "Correspondence: IAEA Safeguards," *International Security* 7 (Spring 1983): 195-199.
- ³⁷ Imad Khadduri, *Iraq's Nuclear Mirage: Memoirs and Delusions* (Toronto: Springhead, 2003), 81-82.
- ³⁸ Nakdimon, *First Strike*, 53-5, 268, 335; Khadduri, *Iraq's Nuclear Mirage*, 74, 82; Wilson, "Visit," 376. See also Vandenbroucke, "Israeli Strike," who estimates that under the best of conditions the Iraqis could have produced a kilogram of plutonium per year, enough for one or two bombs within a decade.
- ³⁹ Michael Jansen, "Baghdad's Bomb—An Inside View," *Middle East International* 691 (10 January 2003): 11.
- ⁴⁰ Hamza, *Saddam's Bombmaker*, 116.
- ⁴¹ Khadduri, *Iraq's Nuclear Mirage*, 78-79, 82. Feldman also believes that the Osirak attack increased Saddam's commitment to acquiring nuclear weapons. *Nuclear Weapons*, 136.
- ⁴² Khidir Hamza, quoted in "National Terrorism Alert Goes Up; Interview With Saddam's Bomb Maker," *CNN Crossfire*, 7 February 2003 <<http://transcripts.cnn.com/TRANSCRIPTS/0302/07/cf.00.html>> (22 November 2004).
- ⁴³ Hamza, *Saddam's Bombmaker*, 131; Watts and Keaney, *Gulf War*.
- ⁴⁴ Leon V. Sigal, *Disarming Strangers: Nuclear Diplomacy with North Korea* (Princeton: Princeton University Press, 1998), 76; Joel S. Wit, Daniel B. Poneman, and Robert L. Gallucci, *Going Critical: The First North Korean Nuclear Crisis* (Washington, DC: Brookings, 2004), 103-104.
- ⁴⁵ Quoted in Ann Scott Tyson, "Use of Force in Korea is Tricky Proposition," *Christian Science Monitor*, 12 February 2003, 2.
- ⁴⁶ Brenda Shaffer, "Iran at the Nuclear Threshold," *Arms Control Today* 33 (November 2003): 7-12; Shahram Chubin and Robert S. Litwak, "Debating Iran's Nuclear Aspirations," *Washington Quarterly* 26 (Autumn 2003): 108; Michael Knights, "Iranian Nuclear Weapons, Part II: Operational Challenges," Policywatch no. 761, Washington Institute for Near East Policy, 29 May 2003, <<http://www.washingtoninstitute.org/watch/index.htm>>; Albright and Hinderstein, "Iran"; David E. Sanger, "Diplomacy Fails to Slow Advance of Nuclear Arms," *New York Times*, 8 August 2004, 1; James Fallows, "Will Iran Be Next?" *Atlantic Monthly* (December 2004): 99-110.
- ⁴⁷ Mark Hibbs, "Bushehr Construction Now Remote After Three Iraqi Air Strikes," *Nucleonics Week* vol. 28, no. 48 (November 26, 1987): 5.
- ⁴⁸ Anthony H. Cordesman, *Iran's Developing Military Capabilities* (Washington: Center for Strategic and International Studies, 2005), 94.
- ⁴⁹ Kenneth R. Timmerman, *Countdown to Crisis: The Coming Nuclear Showdown with Iran* (New York: Crown Forum, 2005), 66-67; Cordesman, *Iran's Developing Military Capabilities*, 95-121.
- ⁵⁰ Wit, Poneman, and Gallucci, *Going Critical*, 211.
- ⁵¹ Boureston, "Strategic Insight."
- ⁵² See John W. Dower, "Lessons From Japan About War's Aftermath," *New York Times*, 27 October 2002, section 4, 13; David M. Edelstein, "Occupational Hazards: Why Military Occupations Succeed or Fail," *International Security* 29 (Summer 2004): 49-91.
- ⁵³ John W. Dower, *Embracing Defeat: Japan in the Wake of World War II* (New York: Norton, 1999).
- ⁵⁴ Adam Przeworski, Michael E. Alvarez, José Antonio Cheibub, and Fernando Limongi, *Democracy and Development: Political Institutions and Well-Being in the World 1950-1990* (Cambridge: Cambridge University Press, 2000); Michael L. Ross, "Does Oil Hinder Democracy?" *World Politics* 53 April (2001): 325-61; Kristian S. Gleditsch, *All International Politics is Local: The Diffusion of Conflict, Integration, and Democratization* (Ann Arbor: University of Michigan Press, 2002); and Robert D. Putnam, *Making Democracy Work: Civic Traditions in Modern Italy* (Princeton: Princeton University Press, 1993).

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- ⁵⁵ Joshua Muravchik, "Bringing Democracy to the Arab World," *Current History* 103 (January 2004).
- ⁵⁶ Anthony Smith, *America's Mission: The United States and the Worldwide Struggle for Democracy in the Twentieth Century* (Princeton: Princeton University Press, 1994).
- ⁵⁷ Roland Paris, *At War's End: Building Peace After Civil Conflict* (Cambridge: Cambridge University Press, 2004).
- ⁵⁸ Marc Trachtenberg, *History and Strategy* (Princeton: Princeton University Press, 1991); Heather A. Purcell and James K. Galbraith, "Did the U.S. Military Plan a Nuclear First Strike for 1963?" *American Prospect* 19 (Fall 1994): 89; William Burr and Jeffrey T. Richelson, "Whether to 'Strangle the Baby in the Cradle': The United States and the Chinese Nuclear Program, 1960-64," *International Security* 25 (Winter 2000/01): 54-99; Aleksandr Fursenko and Timothy Naftali, "*One Hell of a Gamble*": *Khrushchev, Castro, and Kennedy, 1958-1964* (New York: Norton, 1997); and Sigal, *Disarming Strangers*, 33, 59-60, 75-6, 113, 121-123.
- ⁵⁹ Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate Renewed* (New York: Norton, 2003), 93-95; Elizabeth Wishnick, *Mending Fences: The Evolution of Moscow's China Policy from Brezhnev to Yeltsin* (Seattle: University of Washington Press, 2003), 34-36; Michael B. Oren, *Six Days of War: June 1967 and the Making of the Modern Middle East* (Oxford: Oxford University Press, 2002), 75-76; Avner Cohen, *Israel and the Bomb* (New York: Columbia University Press, 1998), 259-276; and Feldman, *Nuclear Weapons*, 131.
- ⁶⁰ Fursenko and Naftali, "*One Hell of a Gamble*," 256.
- ⁶¹ Fursenko and Naftali, "*One Hell of a Gamble*," 242-243.
- ⁶² See Robert S. Ross, "The 1995-96 Taiwan Strait Confrontation," *International Security* 25 (Fall 2000), 87-123.
- ⁶³ Sigal, *Disarming Strangers*, 211, 10, 266n.
- ⁶⁴ Wit, Poneman, and Gallucci, 104, 180; Nicholas D. Kristof, "Tunneling Toward Disaster," *New York Times*, 21 January 2003, A23.
- ⁶⁵ Maoz, "Mixed Blessing."
- ⁶⁶ George Perkovich, *India's Nuclear Bomb: The Impact on Global Proliferation* (Berkeley: University of California Press, 1999), 280; Robert Batcher, "The Consequences of an Indo-Pakistani Nuclear War," *International Studies Review* 6 (December 2004), 135-162.
- ⁶⁷ Paul Lawrence Rose, *Heisenberg and the Nazi Atomic Bomb Project: A Study in German Culture* (Berkeley: University of California Press, 1998), 134-135.
- ⁶⁸ Charles Duelfer, *Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD*, 30 September 2004, <http://www.cia.gov/cia/reports/iraq_wmd_2004/>.
- ⁶⁹ For critical discussion, see Maoz, "Mixed Blessing," 55-59. See also Derek D. Smith, "Deterrence and Counterproliferation in an Age of Weapons of Mass Destruction," *Security Studies* 12 (Summer 2003): 152-197.
- ⁷⁰ Byman and Waxman, *Confronting Iraq*; Dan Reiter, "Deterrence Has Worked in the Past: Use it With Iraq," *Atlanta Journal-Constitution*, 6 November 2002, 17A; John J. Mearsheimer and Stephen M. Walt, "An Unnecessary War," *Foreign Policy* 134 (January/February 2003): 50-59.
- ⁷¹ Ariel Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security* 3 (Winter 2002/2003): 59-88. Levite lists 21 nations (62) to which one should now add Libya. A possible 23rd state would be Iraq, having essentially abandoned its NBC programs under sanctions and inspections in the late 1990s.
- ⁷² Flynt Leverett, "Why Libya Gave Up on the Bomb," *New York Times*, 23 January 2004, A23; Geoff D. Porter, "The Faulty Premise of Pre-emption," *New York Times*, July 31, 2004, A17; George A. Lopez and David Cortright, "Containing Iraq: Sanctions Worked," *Foreign Affairs* 83 (July/August 2004), 90-103.
- ⁷³ Anonymous, *Imperial Hubris: Why the West is Losing the War on Terror* (London: Brassey's, 2004); *Strategic Survey 2003/4* (London: International Institute for Strategic Studies, 2004), esp. 5-6 and 169.

⁷⁴ Jeffrey White, "Iranian Nuclear Weapons, Part III: How Might Iran Retaliate?" Policywatch no. 762, Washington Institute for Near East Policy, 29 May 2003, <<http://www.washingtoninstitute.org/watch/index.htm>>; Graham Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe* (New York: Times Books, 2004), 35.

⁷⁵ Michael Pan, Amanda Terkel, Robert Boorstin, P. J. Crowley, and Nigel Holmes, "Safety Second," *New York Times*, 8 August 2004, p. WK11.