Operation Iraqi Freedom: A First-Blush Assessment

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by

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EXECUTIVE SUMMARY

This paper offers a first-blush assessment of the coalition campaign against Saddam Hussein's regime that began on March 19, 2003, and was declared completed by President George W. Bush on May 1, 2003. Given the lack of comprehensive data on coalition operations and the tentative nature of much of the data thus far made public, many of the "lessons" or implications that follow must be regarded as preliminary. A thorough independent assessment of the conflict is needed, similar to the Gulf War Air Power Survey commissioned by the US Air Force after Operation Desert Storm. Moreover, any assessment of Operation Iraqi Freedom should focus on how the experience of this war will influence future military competitions. The following are among the war's potential implications for US military planners:

STRATEGIC IMPLICATIONS

The United States Is in the Regime-Change Business

If there ever was any doubt that the United States is in the regime-change business, the Second Gulf War should dispel it. Since the fall of the Berlin Wall, the United States has, directly or indirectly, deposed the regime of a foreign state roughly once every three years. But those who practice regime change incur certain responsibilities as well as moral and political consequences. The United States must stabilize Iraq, lest it incur a significant setback in its efforts to make progress in the war against hostile Islamic regimes and radical Islamic terrorist movements. Success, however, will likely involve a protracted occupation of Islamic states (i.e., Afghanistan and Iraq) and exact substantial human and material costs. This means the US military's preference to do what it does best—defeat enemy forces in the field and then quickly depart—must be overcome. The practice of crafting quick exit strategies must yield to a willingness to develop a comprehensive strategy for winning both the war and the postconflict period that follows. In short, the American military—the Army, in particular—must create a significant capability for conducting stability operations.

Divergence, Not Convergence

Although it comes as no surprise to most military observers, Operation Iraqi Freedom again demonstrated the wide—and expanding—gap between the US and all the world's other militaries in conventional operations. The implications for those who consider themselves actual or potential enemies of the United States are clear: they must avoid taking on the American military in conventional war. Rather, they must move to the extremes along the spectrum of conflict. For rogue states such as Iran and North Korea, this means acquiring nuclear weapons or pursuing more ambiguous forms of aggression through support of terrorist organizations. A third option is to develop anti-access and area-denial capabilities.

The Anti-Access Challenge Is Real and Growing

Operation Iraqi Freedom provided a clear lesson for what has been a growing trend: denying US access to overseas bases. Moreover, the Bush Administration's increased emphasis on preventive

strike and preventive war could make it even more difficult to secure forward base access. Foreign governments would be more likely to grant access in response to an act of aggression than when the United States is contemplating initiating military operations. This fact highlights the need for the United States to develop and field military forces capable of conducting large-scale power-projection operations independent of access to forward bases.

PRECISION WARFARE COMES OF AGE

The Second Gulf War found coalition forces in the position of trying to protect the people of Iraq and the nation's infrastructure from the regime in Baghdad. In recent years the United States has waged war against regimes, not nations. Consequently, the US military had the mission of defeating the enemy regime without alienating the population, so as to facilitate postwar reconstruction and stability operations. Key to achieving this objective was limiting noncombatant casualties and damage to the target state's infrastructure. To do this, the US-led coalition had to strike with discrimination and move with great speed. Advanced intelligence, reconnaissance and surveillance capabilities proved critical to identifying military targets. The widespread use of precision guided munitions (PGMs) enabled discriminate strikes, minimizing the loss of noncombatant lives and sparing much of Iraq's economic infrastructure.

Compressing the Engagement Cycle

Time is becoming an increasingly precious asset on the modern battlefield. To offset the remarkable accuracy of PGMs, adversaries can become mobile, compressing the time US forces have between identifying and striking a target. The US military's ability to compress the engagement cycle during Operation Iraqi Freedom represents an important step forward in the transition to a new age of precision warfare.

Precision Strike

The Second Gulf War witnessed the widespread use of precision bombardment on an unsurpassed scale and intensity. Of great importance was the fact that these munitions enabled the US military to wage a campaign that was both ferocious and discriminate.

Joint Integration

The close integration of precision air strikes and ground combat operations—known in military parlance as "joint" operations—proved essential to another critical element of the campaign: the need for ground forces to move quickly to seize Iraq before Saddam could destroy it. Air and ground forces, which had fought essentially separate wars in Operation Desert Storm in 1991, were integrated to a higher degree than ever before.

Friendly Fire

The maturing of precision warfare may reduce substantially the percentage of casualties inflicted by friendly forces upon one another. Preliminary data show that US forces made progress in the ability to minimize mistakenly attacking each other, a phenomenon known as "friendly fire" or "blue-on-blue" engagements. During Operation Desert Storm, 25.6 percent of those killed in

action died as a result of blue-on-blue engagements, versus only 6.5 percent during Operation Iraqi Freedom.

THE BATTLE OVER THE LESSONS OF IRAQ

The battle for Iraq is over. The battle among the Services for pride of place and budget share has begun. This report offers some preliminary observations on these issues.

Persistent Surveillance: UAVs and SOF

The US military's unmanned aerial vehicles (UAVs) continued to grow in importance, and their role seems certain to expand in the future. However, if and when enemy air defense systems become more formidable and the anti-access threat matures, the US military will likely require a significant number of stealthy, extended-range UAVs to maintain the kind of persistent surveillance it found so valuable in Operation Iraqi Freedom. On the basis of early reports, it appears that special operations forces (SOF) played an important role in enabling the persistent surveillance that made it so difficult for Iraqi forces to move without being detected and engaged. The role of SOF may increase if the anti-access/area-denial threat precludes the rapid movement of ground forces into a threatened region.

Bombers

Bombers have performed impressively in all major recent US military operations, and the Second Gulf War proved no exception. Operation Iraqi Freedom saw bombers accounting for less than 3 percent of the strike sorties, but dropping approximately 28 percent of all munitions. The Air Force was able to orbit bombers overhead to provide on-call precision firepower. Operating this way assumes an environment in which enemy air defenses have been neutralized. While this proved to be the case in Afghanistan and Iraq, it may not always hold true. As the anti-access threat grows, the need for extended-range, stealthy strike platforms—be they bombers or Unmanned Combat Aerial Vehicles (UCAVs) —seems certain to increase.

Tankers

Just as the difficulties in securing forward base access increased the US military's reliance on bombers, the need to operate short-range tactical aircraft at more distant bases increased the need for tanker aircraft to extend their range. The tanker-to-total-sortie ratio in the Second Gulf War was double that of Operation Desert Storm. The Air Force's tanker fleet, however, is showing its age. Clearly, the tanker fleet must be modernized. The argument is only made stronger by the Air Force's expanding emphasis on short-range strike aircraft. Yet tanker modernization has not achieved the necessary priority in the Service's budget.

Ground Forces: Conventional and Stability Operations

Operation Iraqi Freedom was undertaken with just one heavy Army division, and it is difficult to imagine what prospective adversary would seek to challenge US supremacy in armored warfare. One clear lesson that has emerged from the coalition operation in Iraq is that stability operations are likely to prove more challenging for the US military than the war itself. Given the number

and scale of stability operations in which the Army is involved, the protracted nature of these operations, and the Service's other commitments, the support of allied forces will likely prove more crucial in this decade than in the last.

Tactical Aircraft

The maturation of the US military's precision strike capabilities threatens to make tactical strike aircraft a victim of their own success. Over the past twelve years, the US military's aggressive fielding of PGMs, and the modification of nearly every strike aircraft to employ them, have greatly enhanced the strike force's effectiveness. Thus, while Operation Desert Storm employed some 1,600 American tactical strike aircraft, Operation Iraqi Freedom required less than half that number. The reduced reliance on tactical aircraft can also be attributed to the difficulty in obtaining access to forward air bases. Yet more than 2,000 new tactical strike aircraft are scheduled to be procured, with the overwhelming majority requiring fixed, forward-base access.

MEETING TOMORROW'S CHALLENGES

Familiar Threats

Genuine transformation of militaries transcends merely becoming more effective in the existing warfare regime; rather, it entails progress toward competing effectively in an emerging warfare regime that promises to be quite different from previous experience. Yet the remarkable US-led coalition campaign in the Second Gulf War was essentially waged against an Iraqi force whose composition would have been familiar to the German Army that introduced blitzkrieg to the world more than sixty years ago. Indeed, the Iraqi military might not have been a match for the Wehrmacht circa 1940, let alone the American military of 2003.

Emerging Challenges

A measure of just how far the US military has yet to go in terms of transforming to meet emerging threats can be seen in the changing face of conflict. The proliferation of ballistic and cruise missile technology will eventually enable even small states to hold at risk the forward air bases and the major ports used to resupply US troops. US power-projection forces increasingly run the risk of confronting adversaries with land-based military forces such as missiles and aircraft and coastal forces such as advanced antiship mines, submarines and small combatants (perhaps masquerading as commercial vessels) equipped with very lethal high-speed antiship cruise missiles. Americans are all too aware of the threat of catastrophic terrorism to the homeland. Access to space is becoming ubiquitous. How will the US military deny an enemy access to space capabilities in the event of crisis or conflict? Nuclear weapons are proliferating. How might a collapsing state's weapons of mass destruction (WMD) be secured before it falls into the wrong hands? The United States has the world's most advanced information infrastructure and, by some accounts, apparently one of the most vulnerable. How will it be defended? Operation Iraqi Freedom offers few clues as to how to prepare for these emerging challenges.

Recent conflicts like the Second Gulf War offer some tantalizing hints about where the US military could be headed along its transformation path. Yet the war in Iraq appears more reflective of old threats than new challenges. Remarkable as the recent developments in US military capabilities have been, they do not suffice to dominate the very different kinds of threats that are emerging. Despite its recent successes, the Pentagon's motto must be, "You ain't seen nothing yet."

I. INTRODUCTION

"This war ain't like the last war, and it ain't like the next war. This war is like this war."

Admiral Vern Clark, Chief of Naval Operations[1]

In early 2003, for the third time in four years, the United States committed its military to a major operation. Following US interventions in Serbia in 1999 and Afghanistan in 2001, the American military once again took on the Iraqi military a dozen years after the First Gulf War.[2] As in the case of Operation Allied Force (Yugoslavia) and Operation Enduring Freedom (Afghanistan), the lopsided US victory in Operation Iraqi Freedom left military experts searching for new superlatives to describe a remarkable display of US military skill and might.

At the same time, the invasion of Iraq has given greater impetus to Defense Department efforts to transform the American military. Remaking the armed forces may seem a bit odd given its remarkable string of successes. However, Secretary of Defense Donald Rumsfeld has argued that the challenges confronting the American military have changed significantly in recent years, with even more dramatic changes on the way. Operation Iraqi Freedom was conducted with forces and equipment developed and fielded almost entirely by previous administrations—much of it reflecting Cold War era threats. These forces and weapon systems proved remarkably effective in the First Gulf War.[3] However, as Rumsfeld would be the first to point out, the force mix used in Operation Iraqi Freedom, and the way it was employed, represent significant departures from that conflict. More changes will be needed to prepare the US military for very different kinds of challenges, including those posed by its growing involvement in stability operations in Iraq and other locations; the likely spread of weapons of mass destruction (WMD) to rogue states and terrorist groups; new threats to the American homeland; counterterrorist man-hunting operations; and emerging anti-access/area-denial challenges to US power-projection operations.

This paper offers a first-blush assessment of the coalition campaign conducted against Saddam Hussein's regime that began on March 19, 2003, and was declared completed by President

[1] The statement was attributed to Admiral Clark, the Chief of Naval Operations, by General John Jumper, the Air Force's Chief of Staff, during a meeting with the author, May 12, 2003.

[2] The terms "Second Gulf War" and "Operation Iraqi Freedom" will be used interchangeably in this paper, as will the terms "First Gulf War" and "Operation Desert Storm."

[3] At the time of the First Gulf War, General Colin Powell, then chairman of the Joint Chiefs of Staff, declared that "Desert Storm was that Cold War battle that didn't come, without [the] trees and mountains [of western Germany]. We got a nice desert, and we got a very, very incompetent enemy to work against." Secretary of Defense Les Aspin and General Colin Powell, "Department of Defense Bottom-Up Review," Department of Defense News Conference, September 1, 1993, the Pentagon, Washington, DC.

George W. Bush on May 1, 2003.[4] Given the lack of comprehensive data on coalition operations and the tentative nature of much of the data that has thus far been made public, many of the "lessons" or implications that follow must be regarded as preliminary. A thorough independent assessment of the conflict is needed, similar to the Gulf War Air Power Survey (GWAPS) commissioned by the US Air Force after Operation Desert Storm.[5] The focus of GWAPS was neither on drawing lessons nor on writing the definitive history of the First Gulf War, but rather on trying to survey, as objectively as possible, what actually happened. However, despite its clear value, no similar assessment was undertaken after any of the major military operations of the Clinton Administration, and both the Bush Administration and the US Congress seem inclined to follow that pattern with respect to the recent conflicts in Afghanistan and Iraq.[6] The Defense Department's reluctance to undertake independent surveys of these military operations means that lessons will likely be drawn without first developing any systematic understanding of what did and did not occur. In short, the US military has been put in the difficult, but not necessarily unwelcome, position of evaluating its own performance.

Any assessment of Operation Iraqi Freedom should focus on how the experience of this war will influence future military competitions, which will likely be significantly different from that posed by the Iraqi armed forces. Put another way, the lessons drawn by the US military should be directed toward preparing for future challenges, not becoming more effective at fighting the last war. Moreover, any assessment of the Second Gulf War should also draw upon insights from other recent conflicts, particularly those in the Balkans and in Afghanistan, to identify possible trends in warfare.[7]

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[4] The president declared major combat operations at an end. However, while Saddam Hussein's regime was deposed, significant resistance to US and coalition occupation forces continued.

[5] Then-Secretary of the Air Force Donald Rice set up GWAPS to take an independent look at air power's role in the First Gulf War. GWAPS was consciously modeled on the US Strategic Bombing Survey conducted at the end of World War II. Eliot Cohen was appointed director, and he was given a fairly free hand in hiring his task force leaders and other senior staff. The Air Force also assigned knowledgeable officers to GWAPS. However, GWAPS reports were largely written by senior staff members Cohen had selected, and the reports were never subjected to review, coordination or other forms of vetting by the Air Staff, Secretary Rice or any other Air Force staff element.

[6] In an attempt to avoid the problems associated with Service self-evaluation, Secretary of Defense Rumsfeld has directed Joint Forces Command to provide him with a "lessons learned" report. The report will be the product of a combined effort by the military service staff members of Joint Forces Command and some outside advisors. It remains to be seen whether a truly independent report will emerge. No doubt there will be strong incentives for inter-Service "log rolling." Moreover, the effort is reportedly proceeding along very short time lines relative to the GWAPS study, which took roughly a year and a half to complete. This raises questions concerning Joint Forces Command's ability both to collect adequate data on the campaign and to analyze it thoroughly.

[7] Again, the reader should view statements offering definitive lessons with caution. In the absence of a thorough survey, it is impossible to draw strong conclusions. For example, US Central Command's Air Force intelligence chief in the First Gulf War believed that the air campaign had eliminated Iraq's nuclear weapons program. The United Nations Special Commission (UNSCOM), and GWAPS eventually documented in detail that this was not, in fact, the case. This example illustrates how mistaken the impressions that participants carry away from a conflict can be. Similarly, coalition fighter crews claimed during the campaign to have killed 80 or more mobile SCUD launchers, which was probably two to three times Iraq's entire inventory. Consider, as another example, the disagreement that persists to this day between the Army and the Air Force as to which Service killed what share of Iraqi tanks and other heavy equipment during Desert Storm. A representative statement of the Army's view was Lieutenant General (Army, retired) William Odom's assertion in the July–August 1997 issue of *Foreign Affairs* that the "overwhelming majority—70–80 percent—of Iraqi tanks were destroyed by army tanks and attack helicopters, not by strategic or tactical aircraft." The problem with this claim is that meticulous analysis of U-2 imagery from a

This paper is organized around the major implications that might be drawn from Operation Iraqi Freedom. This discussion is followed by a brief assessment of what kinds of military systems, capabilities or force elements seem to be increasing and decreasing in value. The paper concludes by examining what Operation Iraqi Freedom might imply for US military transformation.

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mission that covered the Kuwait Theater of Operations (KTO) on March 1, 1991, revealed that the twelve heavy Iraqi divisions there had abandoned 1,135 tanks prior to moving out to flee or fight during the ensuing ground campaign (Central Intelligence Agency, "Operation Desert Storm: A Snapshot of the Battlefield," September 1993, IA 93-10022). There is agreement among military services that by March 1, 1991, coalition forces had destroyed a total of 2,633 tanks, which means that coalition aircraft accounted for at least 43 percent of tank attrition by the time the coalition suspended offensive operations. When tanks killed by the Marines and Arab participants are eliminated, the Army's share cannot exceed 49 percent, assuming that coalition aircraft killed no Iraqi tanks during the ground campaign or in any of the Iraqi front-line units at any time. Thus, the belief that the Army was responsible for 70 to 80 percent of these kills is impossible to square with the best available evidence. Nevertheless, it appears that the Army and the Air Force are still unable to agree on what happened regarding heavy-equipment attrition in the KTO more than a decade after the conflict ended. When two Services cannot agree on a fact this basic, it is difficult to draw conclusive lessons from a conflict with any high degree of confidence. Hence the vital importance of determining what really happened. Consider also Milosevic's acceding to NATO demands in Kosovo in June 1999. Why did he cave? The answer cannot be deduced with even modest confidence. Nor did the Defense Department undertake vigorous efforts afterward to find out. Given the level of ignorance regarding this matter, it becomes very difficult to draw clear lessons from that campaign about air power's role in future effects-based operations.

The author is indebted to Barry Watts, who served on the Gulf War Air Power Survey, for these insights.

II. STRATEGIC IMPLICATIONS

THERE IS NO INTERNATIONAL CONSENSUS REGARDING SECURITY

"Whatever the circumstances, France will vote no."

Jacques Chirac, President of France[8]

In the months leading up to the Second Gulf War, the Bush Administration attempted, without success, to replicate the broad international consensus achieved prior to the First Gulf War. The high level of international agreement achieved prior to Operation Desert Storm has proved an anomaly, a rare moment in history following the Cold War's end when old American adversaries had seemingly stacked arms and before long-term Cold War US allies began to pursue more independent paths. Interestingly, although it emerged as a template for US defense planners,[9] the First Gulf War proved unlike most other major US military operations since the fall of the Berlin Wall. The war was waged in response to an act of flagrant aggression by Iraq, as opposed to more subtle challenges later advanced by Slobodan Milosevic, the Taliban, and recently Saddam Hussein. Moreover, Desert Storm's objectives were limited to evicting Iraqi forces from Kuwait, not changing the enemy's regime, which has become a more characteristic objective of US military operations.[10]

Achieving a broad international consensus in support of US military intervention is desirable. However, as the experience of the post–Cold War era shows, it is not always achievable or even necessary. To be sure, both the United Nations and the Organization of American States supported the US military intervention in Haiti. However, the United States alone took the lead when it conducted strikes against suspected terrorist targets in Afghanistan and Sudan in August 1998 following the attacks on American embassies in Kenya and Tanzania. Broad international sanction was also lacking in December 1998, during Operation Desert Fox, the brief Anglo-American air strike campaign conducted in the wake of Iraq's eviction of UN weapons inspectors. In 1999 NATO intervened against Yugoslavia without a Security Council resolution sanctioning the operation. Yet following the attacks of 9/11, both the United Nations Security Council and NATO sanctioned the US campaign against al-Qaeda and its Taliban hosts in Afghanistan.

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[8] "Against America? Moi?" *The Economist*, March 15, 2003, p. 47.

[9] See Andrew F. Krepinevich, *The Bottom-Up Review: An Assessment* (Washington, DC: Defense Budget Project, February 1994), pp. 38–40.

[10] Despite Saddam Hussein's act of flagrant aggression and broad international community support for action, there was strong congressional opposition to the First Gulf War. Opposition fell primarily along party lines, with Republicans overwhelmingly supporting military action, while Democrats were generally opposed. Interestingly, among the few Democrats who supported military action were two future party leaders, Senators Albert Gore and Joseph Lieberman.

If the international community cannot be counted upon to speak with one voice, neither can long-standing US allies. During Operation Allied Force, Greece refused to allow NATO forces engaged in operations against Yugoslavia access to its air bases. Turkey refused the use of its bases to US forces engaged in strikes against Iraq during Operations Desert Fox and Iraqi Freedom. France threatened to use its Security Council veto to block the efforts to gain UN support for the US-led coalition's invasion of Saddam Hussein's Iraq.

Indeed, if someone had said but fifteen years ago that a superpower was undertaking a major military operation with military support from the Czechs and Poles, from bases in Bulgaria and Romania, and against strong protests from both France and Germany, the natural assumption would have been that the speaker was referring to the Soviet Union. Of course, in 2003, that superpower was the United States. What kinds of coalitions will Washington be cobbling together in 2008? In 2013? It seems increasingly clear that, as Secretary of Defense Rumsfeld observed, the mission now determines the coalition. The era of rigid alliances, if it ever truly existed, is clearly over, and the United States must plan accordingly.[11]

While achieving a broad consensus before taking military action is problematic, what does seem both possible and necessary for major US military action is the creation of a significant coalition. This criterion does not stem primarily from Washington's need for military support to wage war. What America does desire, and need, is some measure of political sanction from members of the international community. Such support lends legitimacy to US actions. As the principal guarantor of the international order and a prime beneficiary of that order, the United States has a strong interest in promoting established international rules and norms. Such international sanction has also proven important in establishing and maintaining domestic political support for major military operations abroad.

Finally, as the United States has discovered in the Balkans, Afghanistan and Iraq, allied support has often been helpful in stability operations and nation-building efforts following the termination of major hostilities. The United States has wisely sought to avoid bearing the entire financial burden of helping to rebuild a country that comes with triggering a regime change, or the military burden for the manpower-intensive stability operations that threaten to tie down a significant portion of the American military. Allied help in both areas has turned out to be increasingly important as the Bush Administration wages a Global War on Terrorism and confronts rogue states suspected of acquiring—or striving to acquire—WMD.[12]

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[11] Even during the Cold War the United States was hardly immune to periods of estrangement from its allies. For example, relations between Washington and some key allies were strained over the 1956 Suez Crisis, the Vietnam War and when the United States conducted punitive strikes against Libya for its support of international terrorism.

[12] Allies have played several important roles. They have provided intelligence. Good intelligence is crucial in any war, and it is especially important in man-hunting operations against terrorist groups. The United States has also found that drying up terrorist groups' sources of support involves monitoring and tracking financial flows. Such efforts would be difficult, if not impossible, without the cooperation of other states. The ability to access forward bases belonging to other states to support a range of military operations is another important factor in these operations. As the global commitment of US forces grows, allied support in peacekeeping or stability operations can relieve some of the strain on American force deployments, as has been the case in Afghanistan, the Balkans and Iraq.

THE UNITED STATES IS IN THE REGIME-CHANGE BUSINESS

"Even cowboys like posses."

George W. Bush[13]

If there ever was any doubt that the United States is in the regime-change business, the Second Gulf War should dispel it. Since the fall of the Berlin Wall, the United States has, on average, deposed the regime of a foreign state roughly once every three years. Panama, Haiti, Yugoslavia, Afghanistan and Iraq have each seen their despotic regimes turned out, directly or indirectly, by force of American arms. To be sure, the principal motives driving the use of American military power for this purpose may have differed somewhat depending upon whether a Democrat or a Republican occupied the White House. This fact notwithstanding, in the wake of the attacks on New York City and Washington, DC, popular support for US military intervention abroad has broadened substantially. As a consequence of 9/11, the Bush Administration has demonstrated a willingness to consider—indeed, prosecute—preventive war as a means of defense against states that harbor terrorists or seek nuclear weapons capability.[14] It seems, therefore, that further operations involving regime change are likely.

As can be seen in the wake of the coalition's victory in Iraq, those who practice regime change incur consequences as well as certain moral and political responsibilities. While this has always been true, the stakes are particularly high in Iraq. Recent experience shows that when the United States pursues a quick exit strategy following a regime-change intervention, as in Haiti, there is a high risk that the situation will revert to its pre-intervention state. The effect is comparable to plunging one's fist into a bucket of water and then removing it. Stabilizing a country following an intervention is often a protracted process, and, as shown by the US experience in Vietnam and more recently in places such as Haiti and Somalia, success is hardly assured. A legitimate government must be established that will not re-create the circumstances that led to intervention in the first place. The economy must be restored (or, in some cases, built up) to the point where the population will sustain its support for the new political system. Security must be provided against residual domestic opposition groups and hostile states that wish to undermine stability. All of these actions require more than resources and an insightful strategy. They take considerable time, as can be seen by the continued presence of US troops along with NATO forces in Bosnia and Kosovo, and in Afghanistan.

At present, there is no clear sense of when American forces engaged in these stability operations might be withdrawn. While operations in the Balkans and Afghanistan impose a significant tax on the US military's forces and budgets, they are small potatoes compared to Iraq, even if other like-minded states, such as those that participated in the Second Gulf War coalition, provide support. If the United States and its allies succeed in stabilizing Afghanistan and Iraq to the point where legitimate, representative, pro-American regimes are in place, it will be a major victory in

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[13] "The View From Foggy Bottom," *US News & World Report*, May 5, 2003, p. 19.

[14] *National Security Strategy of the United States of America* (Washington, DC: The White House, September 2002), pp. 6, 15.

the wider war against radical Islamic insurgents. If they fail, America's adversaries in the Islamic world will likely be encouraged to persist in their efforts to eliminate US influence, while Washington could find it increasingly difficult to act forcefully abroad to protect areas of vital interest.

Hence the US military's preference to do what it does best—defeat enemy forces in the field and then quickly depart—must be overcome. The practice of crafting quick exit strategies must yield to a willingness to develop a comprehensive strategy for winning both the war and the postconflict period that follows.[15] In short, the American military—the Army, in particular—must reorient itself from its emphasis on conventional warfare and create a significant capability for conducting stability operations. This may prove a hard sell, given the scars it bears from Vietnam, the less than successful outcomes of interventions in Haiti and Somalia, and the long-term commitment such operations entail.

ARE WE THAT GOOD, OR ARE THEY THAT BAD?

"US military technology is beyond belief."

Iraqi Republican Guard Colonel[16]

Warfare involves a struggle between at least two adversaries. Thus American military prowess is a function not only of the capabilities stemming from its enormous advantage in resources, but also of its relative effectiveness against the capabilities brought to bear by its enemies. Simply put, is the US military that good, or was the Iraqi military that bad? The answer to both questions seems, at this early juncture, to be "yes."[17]

While the US military's performance was striking in many respects, it may have been surpassed by the stunning ineptitude of its Iraqi adversary. Recalling an earlier observation of General Norman Schwarzkopf regarding Saddam Hussein's military acumen, the current Vice Chairman of the Joint Chiefs of Staff, General Peter Pace, dubbed Saddam Hussein "the world's worst general."[18]

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[15] A strong case for such a comprehensive approach can be found in Nadia Schadlow, "War and the Art of Governance," unpublished paper, July 2003.

[16] Terry McCarthy, "What Ever Happened to the Republican Guard?" *Time*, May 12, 2003, p. 38.

[17] Again, without an Iraqi Freedom version of GWAPS, it is difficult to reach conclusive answers to either of these questions. Despite some interesting observations obtained from Iraqi officers by the media, it is not yet possible to develop a clear picture of how the Iraqi military operated, and why. For example, why did the Iraqis fail to destroy the dams and dikes in southern Iraq and flood areas through which coalition forces planned to advance? Was it because key Iraqi commanders had been "turned" prior to the conflict through US intelligence operations? Or because the Iraqi high command was unable to give the order to commence their destruction because their communications were disrupted through coalition air attacks? Or was it because these key assets were seized by coalition special operations forces before they could be destroyed? Was it some combination of these factors, or something else? At present, a clear picture is impossible to discern and, given the Defense Department's allergy toward determining exactly what occurred and why, will likely remain so for some time to come.

[18] Evan Thomas and Martha Brant, "The Secret War," *Newsweek*, April 21, 2003, p. 24.

For reasons that are as yet unclear, the Iraqis failed to pursue several military options that were apparently within their ability to execute, and that were of intense concern to the Central Command (CENTCOM), the US war-fighting headquarters. Among these options were:

- Attacking US and coalition forces staging in Kuwait preemptively (i.e., prior to the conflict's initiation) with missiles armed with chemical warheads;

- Attacking Israel in a similar fashion;

- Destroying Iraqi oil facilities upon the onset of hostilities;

- Destroying key dams and dikes in southern Iraq to flood the lower Tigris and Euphrates River Valley, thereby slowing the advance of coalition forces on Baghdad; and

- Holding Republican Guard forces inside Baghdad to force an urban battle with US forces.

Had any one of these options been pursued with even a modest degree of effectiveness, the Iraqis could have significantly stressed the coalition's battle plan. Had they all been executed competently, the coalition might have been presented with a serious challenge. Yet the Iraqis, for reasons that have yet to be determined, failed to act. Perhaps the Iraqis' inability to pursue these options was the result of coalition military operations. For example, coalition special operations forces (SOF) and Central Intelligence Agency (CIA) paramilitary units were operating in Iraq prior to the formal onset of hostilities. Special Forces units moved quickly to secure key infrastructure once the shooting started. They may have made it difficult and risky, if not impossible, for the Iraqi military to carry out several of those options. The United States also undertook a major psychological operations effort prior to the conflict, attempting to turn senior Iraqi officers against Saddam Hussein's regime. Could these operations have induced inaction?

It seems likely, however, that the Iraqi military's poor showing is a continuation of the acute performance failure that has characterized Arab military operations for over half a century. The Arab militaries' seeming inability to learn from a long string of decisive defeats is a recurring theme of Middle East conflicts. The defeat of Arab militaries by the Israelis in major conflicts in 1948, 1956 (when they were assisted by the British and French), 1967 and 1973 was followed by even more lopsided losses at the hands of US-led coalitions in 1991 and now in 2003.

Arab militaries appear to suffer from some enduring structural and cultural problems that place them at a severe disadvantage when it comes to waging modern conventional warfare. One endemic problem is the authoritarian character of their governments. Many Arab leaders, such as Saddam Hussein, have been more concerned with avoiding a coup than with military effectiveness. Consequently, commanders are chosen more for their political reliability than their military competence. Arab society is also relatively hierarchical. The effect has been to create a gap between the officer corps and their troops. With few notable exceptions, Arab militaries have lacked a strong noncommissioned officer corps, which in the US military forms an indispensable interface between officers and their troops. The American military culture encourages officers to lead from the front, where they can react quickly to changing circumstances on the dynamic modern battlefield. Arab officers typically lead from the rear. Whereas American culture values

self-initiative and "Yankee ingenuity," authoritarian regimes such as Saddam Hussein's Iraq view with suspicion those who act independently of direction from the center. Given these factors and the growing compression of time on the modern battlefield, is it any wonder that the Americans, with their vastly superior technology, were able to rout the Iraqis not once, but twice?[19]

Finally, Arab militaries have experienced great difficulty in undertaking critical self-examinations and thereby learning from defeats and taking corrective action. It has been argued that the Arab world has come to value words more than deeds and that, after decades of military failure, it embraces wishful thinking in lieu of hard-headed analysis. For example, a sizeable portion of the Arab world apparently believes that either the CIA or Israel's Mossad conducted the 9/11 attacks on the United States. During Operation Iraqi Freedom, while the rest of the world witnessed one of the most impressive feats of arms in recent memory by coalition forces, Cairo newspapers carried such headlines as "Baghdad: Fortress of Lions," "Signs of Victory and Divine Anger" and "Bush in Shock, Rumsfeld Looks for Excuses." Videos of Iraqis celebrating Saddam Hussein's fall in the streets of Baghdad were dismissed by some well-educated Arabs as staged by US forces.[20]

One bright spot for the Iraqis was their irregular units, or Fedayeen Saddam. These forces, which had been previously used to enforce the regime's control over the Iraqi people, showed more initiative than their conventional military counterparts, but were generally disorganized. During Operation Iraqi Freedom (March 19–May 1, 2003) they proved little more than a nuisance to coalition forces. However, their appearance does confirm one lesson that America's enemies have learned from the Second Gulf War and other recent conflicts: it is suicide to take on the American military directly.

DIVERGENCE, NOT CONVERGENCE

"The Americans have rewritten the textbook, and every country had better take note."

Yevgeny Pashentsev, Russian military expert[21]

Although it comes as no surprise to most military observers, Operation Iraqi Freedom again demonstrated the wide—and expanding—gap between the US and all the world's other militaries in conventional operations. As Major General Buford C. Blunt III, commander of the Army's 3rd Infantry Division, put it, "Our equipment was superior, our training was superior, our soldiers were superior. [The Iraqis] had the larger numbers—[they] greatly outnumbered us—but our technology was vastly superior with our situational awareness, our ability to communicate, [and our] command and control."[22] Other militaries have drawn even broader conclusions. Vladimir

[19] For a detailed treatment of the state of the Iraqi military prior to the Second Gulf War, see Kenneth M. Pollack, *The Threatening Storm* (New York: Random House, 2002).

[20] David Lamb, "Arabs Protest US Presence But Lack Strategy," *Los Angeles Times*, April 25, 2003, p. 22.

[21] Fred Weir, "Iraqi Defeat Jolts Russian Military," *Christian Science Monitor*, April 16, 2003, p. 6.

[22] Ibid.

Dvorkin, head of the Russian Defense Ministry's official think tank, remarked that "The gap between our capabilities and those of the Americans has been revealed, and it is vast."[23]

The implications for actual or potential enemies of the United States are clear: they must avoid taking on the American military in conventional war, as Iraq has twice done. Rather, they must move to the extremes along the spectrum of conflict. For rogue states such as Iran and North Korea, this means acquiring nuclear weapons, or pursuing more ambiguous forms of aggression, as Iran does through its support of terrorist organizations such as Hezbollah. A third option, discussed below, is to develop anti-access and area-denial capabilities.

THE ANTI-ACCESS CHALLENGE IS REAL AND GROWING

"The access problem is going to become much more difficult in the future."

General Michael Hagee, Commandant, US Marine Corps[24]

Operation Iraqi Freedom provided a clear lesson on a growing trend with respect to US access to overseas bases. Simply put, acquiring such access is becoming more problematic.[25] The Second Gulf War found the US-led coalition denied the kind of base access it enjoyed in 1991 during the First Gulf War. Two key allies in that first conflict, Saudi Arabia and Turkey, refused to allow US combat strikes to be flown from their territory or American ground forces to deploy through it.

The result was significant. The US Army's 4th Infantry Division, which had been expected to move through Turkey to open a northern front in Iraq, was denied access by Ankara shortly before the onset of the war.[26] This effectively took not merely a division out of the operation, but the division with the most advanced digital war-fighting capabilities. Moreover, roughly 100 Air Force aircraft were forced to sit on the sidelines when the Turks refused to allow air operations to be conducted from the American base at Incirlik.[27] Also disrupted were the Air Force's tanker refueling operations in support of Navy carriers in the Mediterranean. These tankers were essential for the carriers' strike aircraft to reach their targets in Iraq. Rebased tanker aircraft operating out of Bulgaria provided an acceptable if not entirely satisfactory solution.

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[23] Ibid.

[24] Kim Burger, Nick Cook, Andrew Koch, and Michael Sirak, "What Went Right?" *Jane's Defence Weekly*, April 30, 2003, pp. 20–25.

[25] The discussion here refers principally to problems associated with obtaining political access to forward bases. Other dimensions of the anti-access challenge are geographic and military in nature. See Andrew F. Krepinevich, *Transforming America's Alliances* (Washington, DC: CSBA, 2000), pp. 61–64.

[26] There is some uncertainty as to whether the 4th Infantry Division was, in fact, intended to play a key role in the early phases of the war. However, it seems unlikely the United States would have requested permission from Turkey to move the division through its territory (and offered to pay a king's ransom to do it) if the unit was not destined to play an important role in the war.

[27] David A. Fulghum, "Fast Forward," *Aviation Week & Space Technology*, April 28, 2003, pp. 34–35.

The disruption was felt less with respect to Saudi Arabia, which apparently did allow some US combat operations to originate from its territory. Unlike the Turks, the Saudis also made their position clear relatively early in the period leading up to the war, enabling the US military to take some offsetting measures, such as moving CENTCOM's forward-deployed headquarters to Qatar.

The decision by Ankara and Riyadh to deny US forces access led to almost exclusive reliance on Kuwait as the source of American ground combat power. Air Force units unable to base in Kuwait had to operate out of more remote bases, further stressing the Service's limited tanker assets. While the US military was able to "work around" the base access problem in this conflict, there is no guarantee that this will be possible in future contingencies. Moreover, with the continued diffusion of ballistic and cruise missiles, large, fixed forward bases—be they air bases, major ports or "iron mountains" of supplies—will likely be increasingly at risk.[28]

Finally, the Bush Administration's shift toward increased emphasis on preventive military operations relative to deterrence could make it more difficult to secure forward base access. Foreign governments seem more likely to grant access in response to an act of aggression, when the danger confronted is imminent, than when the United States proposes preventive strikes or wars. This highlights the need for the United States to develop and field military forces capable of conducting large-scale power-projection operations, if need be, independent of access to forward bases.[29]

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[28] For a detailed discussion of the threat to forward base access, particularly as it affects air forces, see Christopher J. Bowie, *The Anti-Access Threat and Theater Air Bases* (Washington, DC: CSBA, 2002).

[29] National Defense Panel, *Transforming Defense*, pp. 33–35; see also Andrew F. Krepinevich, Barry D. Watts and Robert O. Work, *Meeting the Anti-Access and Area-Denial Challenge* (Washington, DC: CSBA, 2003).

III. PRECISION WARFARE COMES OF AGE

NEW TOOLS FOR A NEW MISSION

The Second Gulf War found the invading coalition forces in the highly unusual position of trying to protect the people of Iraq and the nation's infrastructure from the regime in Baghdad. This represents a remarkable departure from the history of the past century; one strains to find examples of conflicts in which the government of a state posed the principal danger to the country and its inhabitants, and the invading power accorded high priority to protecting both the local population and its economic infrastructure. Throughout history, the role of a state's military forces has typically been to interpose themselves between the enemy and the homeland. Correspondingly, the advent of aerial bombardment in the first half of the 20th century was viewed as a way of avoiding the enemy's armies and inflicting damage directly on its population and war-making infrastructure. Thus the strategic air campaigns of World War II sought, first, to destroy the enemy's economic infrastructure and, second, to break the population's will to resist. During the Cold War the United States structured its nuclear strike forces, in part, to deter a Soviet attack by maintaining a capability to destroy the Russian economy.

In recent years, however, the United States has waged war against regimes, not nations. Its dispute is not with the population but with the tyrant who exercises power over it. As in Yugoslavia and Afghanistan, in Iraq the US military was given the mission of defeating the enemy regime without alienating the population, to facilitate postwar reconstruction and stability operations. The presumption has been that an overwhelming majority of the country's population does not willingly support the despotic regime. Key to achieving this objective is limiting noncombatant casualties and damage to the target state's infrastructure. To do this, the US-led coalition had to strike with great discrimination and move with great speed.[30] The advent of advanced intelligence, reconnaissance and surveillance capabilities proved critical to identifying military targets. The widespread use of PGMs enabled coalition forces to strike enemy targets with great discrimination, minimizing the loss of noncombatant lives and sparing much of Iraq's economic infrastructure. Similarly, while SOF were almost an afterthought in the First Gulf War, they played a major role in Operation Iraqi Freedom. Special operations forces were deployed behind Iraqi lines on a scale unprecedented in recent warfare, enabling key Iraqi targets to be struck with great precision while keeping collateral damage to an absolute minimum. Special Forces were also able to move quickly to seize key infrastructure assets within Iraq, such as oil fields and dams.

[30] The need to move quickly is driven by several factors. One is the need to minimize the hardship on the target country's indigenous population and the danger that it may confront from its own regime. For example, prior to the Second Gulf War, concerns were raised over the possibility that Saddam Hussein, a Sunni Arab, might attack Iraqi Shi'ite Arabs and Kurds who had rebelled against his rule. Another reason for speed is to seize a country's infrastructure before it can be destroyed as part of a "scorched earth" campaign by the target regime. A third reason is to avoid stressing what may be a fragile international coalition (or, for that matter, US public opinion).

Absent the discriminate strikes made possible by the use of PGMs and SOF, coalition forces might have risked destroying a significant part of the country and inflicting substantial casualties on noncombatants in order to depose Saddam Hussein and his Ba'athist regime.[31] Had this occurred, the already formidable difficulties involved in stabilizing Iraq following the war would almost certainly have increased substantially.

Precision warfare may in itself represent a military revolution. Certainly it has dramatically changed the character of military competitions. Perhaps even more dramatic has been the expansion of US surveillance, and command and control capabilities that enhance the effectiveness of precision munitions. Militaries that confront adversaries with the kind of precision warfare capabilities that, thus far, are the sole preserve of the United States must make major modifications in the way they operate. In the thirteen years since the First Gulf War, as the United States has expanded the numbers and types of weapons in its PGM arsenal, its adversaries have attempted to develop offsets. The Iraqis, for example, like the Serbs before them, sought to use camouflage and concealment to avoid detection, or to harden key fixed targets, such as command centers, to reduce the effectiveness of precision strikes. These attempts were countered by US advances in gaining air and information superiority to facilitate target detection, compress the engagement cycle and exploit the growing family of PGMs.

Given the centrality of precision warfare in Operation Iraqi Freedom, it is worth examining some of its salient aspects in detail, including gaining air and information superiority, integrating SOF into the campaign, conducting precision strikes and compressing the engagement cycle. This examination is followed by a discussion of the "shock and awe" concept and the issue of friendly fire.

AIR SUPERIORITY AND INFORMATION ADVANTAGE

Although achieving air superiority and gaining an information advantage were important priorities in the First Gulf War, US reliance on them was even greater in Operation Iraqi Freedom. In large measure this reliance stemmed from the coalition war plan, which emphasized nonlinear ground operations and the use of small, highly distributed SOF. The result was a battlefield with no clear front and rear areas. The challenge of differentiating between friend and foe was formidable. Information technologies were crucial to meeting this challenge. The war plan also sought to increase the ability to strike time-sensitive targets, such as members of the Iraqi leadership, terrorists, WMD caches and mobile missile launchers. This required improvements in persistent surveillance and the ability to move target information very quickly to strike elements in the force. Air superiority enabled the Services to provide the level of close air support strikes needed by a relatively small, but fast-moving ground force. Air superiority also facilitated the intelligence, surveillance and reconnaissance (ISR) needed to inform coalition

[31] The number of PGMs employed in Operation Iraqi Freedom was roughly equal to the number employed in Operation Desert Storm. However, their role in the overall air campaign increased by an order of magnitude, from roughly 7 percent in Desert Storm to nearly 70 percent in Iraqi Freedom. Moreover, the intensity of PGM use was greater in the Second Gulf War, as the period of major military operations was relatively brief compared to the First Gulf War.

combat and support operations and to establish an information advantage that would keep the Iraqis in the dark concerning the movement of coalition forces, especially SOF. Both air superiority and information dominance operations were under way well before the initiation of general hostilities. For example, between March 1 and March 20, when the US air offensive commenced, coalition aircraft flew more than 4,000 sorties to degrade Iraqi air defenses.[32]

No doubt recalling the experience of the First Gulf War, when their air defense network was quickly and substantially degraded, most Iraqi surface-to-air missile (SAM) antiaircraft units were apparently either inoperative or unwilling to turn on their radars for fear of becoming quick targets for American anti-radiation missiles. As one US Air Force pilot put it, "Iraqi radar was a no show."[33] If the Iraqi SAMs proved nothing more than a nuisance for coalition aircraft, the Iraqi air force was nonexistent. No Iraqi aircraft rose to challenge coalition air operations.

Just how much the Iraqi defenses were in the dark is reflected in the well-publicized Iraqi hunt for downed US pilots near Baghdad. The search was triggered by two old Air Force Predator UAVs that had been stripped of their equipment and sent to hover over Baghdad's airspace in an attempt to get the Iraqis to activate their air defense radars. The craft were never shot down, but crashed only after they ran out of fuel.

Although details are as yet hard to come by, it seems likely that the Iraqi high command's ability to communicate with its forces in the field and coordinate their movements broke down early in the conflict. One incident sums up just how poor Iraqis situational awareness was. Believing US forces were more than 100 miles away, an Iraqi general left Baghdad and, heading south, drove straight into a US Marine roadblock.

As a result, according to Lieutenant General William Wallace, the US Army's V Corps commander in Iraq,

> It continually took the Iraqi forces a long time—somewhere on the order of 24 hours—to react to anything we did. By the time the enemy realized what we were doing, got the word out to his commanders and they actually did something as a result, we had already moved on to do something quite different. For a commander, that's a pretty good thing—fighting an enemy that can't react to you.[34]

COMPRESSING THE ENGAGEMENT CYCLE

Time is becoming an increasingly precious asset on the modern battlefield. One offset against the remarkable accuracy of PGMs is for adversaries to become mobile, compressing the time US forces have between identifying and striking the target. Rapid engagement is also important

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[32] Fulghum, "Fast Forward," pp. 34–35.

[33] Ibid.

[34] James Kitfield, "Attack Always," *National Journal*, April 26, 2003, pp. 1292–1296. To an even greater extent, Iraqi reactions were slowed by the knowledge that moving in large formations exposed them to ISR detection and, consequently, devastating fire from US air and ground forces.

when prompt fire support is required, as, for example, when a SOF team unexpectedly encounters a large opposing force. The US military's improvements in compressing the engagement cycle—the time between when a target is identified and when it is attacked—are crucial to effective operations in an era of precision warfare.

Experience in the First Gulf War had suggested that compressing the engagement cycle would become important, especially against time-sensitive targets such as a mobile missile launcher fleeing the site of a Scud launch.[35] During Operation Desert Storm it typically took about 72 hours to compile the Air Tasking Order (ATO), which (among other things) directed which targets would be struck. The cycle of target generation, attack execution and battle damage assessment often took several days, as did targeting Tomahawk cruise missiles.

Eight years later, during Operation Allied Force against Serbian forces in Yugoslavia, progress had clearly been made. The average sensor-to-shooter cycle was cut from the three days it took to create the ATO to about three to four hours. Tomahawk targeting time was reduced to less than two hours.

By 2001, during Operation Enduring Freedom in Afghanistan, "sensor-to-shooter" cycle times were reduced even further. In many respects, Afghanistan served as a laboratory for time-sensitive targeting. Advanced PGMs were linked with cutting-edge command, control, communications and intelligence capabilities. Predator drones loitered over the battlefield, scanning the ground and relaying images of enemy activity. They fed live, or "real-time," battlefield video directly to AC-130 gunships for the first time.[36] This hunter-killer team was used to attack small groups of Al Qaeda/Taliban fighters and other fleeting targets. Moreover, Special Forces teams linked to precision-strike aircraft loitering overhead proved very effective in locating and designating Al Qaeda/Taliban targets for precision attack.[37] Once a specific target was identified, a laser-designator could be used to "mark" it for destruction by a laser-guided bomb (LGB). More frequently, however, specially trained combat controllers determined the target's precise geo-location by using a laser range-finder unit connected to a hand-held global positioning system (GPS) receiver.[38] The coordinates could then be passed by radio to aircraft

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[35] In 1991 the biggest obstacle in the case of Iraqi's mobile Scud launchers was not cycle time per se but sensor limitations. Before the war the US Air Force (USAF) flew F-111Fs and F-15Es against an actual MAZ-543 Scud transporter-erector-launcher (TEL) at night. What the crews discovered was that if the missile was not erected, they had little luck finding the TEL with onboard sensors. Indeed, in the tests the aircrews were given exact coordinates prior to takeoff, yet success finding the TEL was low when the missile was down. Of course, with better sensors, the cycle time would have become an issue for aircraft hunting Scuds. Operation Allied Force offers a better example of the challenge of compressing engagement-cycle times. When the USAF starting going after Serbian ground equipment in Kosovo, the time lags between sensing and ordnance release tended to be hours to a day, and invariably the equipment was able to avoid being targeted by moving before US strike aircraft arrived.

[36] Each gunship was armed with a 105-mm howitzer, a 40-mm cannon and two 20-mm Gatling guns capable of firing 2,500 rounds per minute. See Eric Schmitt and James Dao, "Use of Pinpoint Airpower Comes of Age in New War," *New York Times*, December 24, 2001, p. 1.

[37] See, for example, Thom Shanker, "Conduct of War Is Redefined by Success of Special Forces," *New York Times*, January 21, 2002, p. 1, and Dana Priest, "Team 555 Shaped a New Way of War," *Washington Post*, April 3, 2002, p. 1.

[38] The Department of Defense (DoD) apparently quickly purchased commercially available Leica Viper laser range-finders for this purpose during the war. Vince Crawley, "Spec Ops Praised for Focus on 'Customers,'" *Army Times*, March 25, 2002, p. 18.

loitering overhead and plugged into GPS-guided Joint Direct Attack Munitions (JDAMs). Operating in this manner, a relatively small number of Special Forces operators—about 300 by the fall of Kandahar—were able to increase dramatically the effectiveness of US precision strikes.

As in operations in the Balkans and Afghanistan, the key enabler in both the targeting and the strike process has been the development of robotic aircraft, or UAVs, such as the Predator and Global Hawk. In the First Gulf War, UAVs played a minor role. The only reconnaissance drone available was the Pioneer. By the end of the 1990s, however, UAVs were being used with increasing frequency, first in the Balkans, and then more aggressively in Afghanistan and Iraq. They scouted for enemy targets and relayed information to strike elements. Some Predators were also armed with air-to-surface missiles, enabling them to strike at targets almost immediately once clearance had been given remotely. This capability achieved great notoriety when a Predator killed a group of al Qaeda operatives in Yemen. The UAVs' ability to remain aloft for long periods and to provide persistent surveillance made it increasingly difficult for Iraqi forces to make any significant moves without being detected.

In Operation Iraqi Freedom, ten types of UAVs were employed in unprecedented numbers. Key US manned ISR assets also included U-2 and E-8C Joint Surveillance Target Attack Radar System (JSTARS) aircraft. Many coalition strike aircraft were able to monitor the movement of Iraqi forces by using radar images transmitted directly to them from these ISR aircraft, even in sandstorms. Moreover, UAV ISR aircraft sometimes executed strike missions, continuing a role they first played in Afghanistan. For example, Predator UAVs fired Hellfire antitank missiles against Iraqi targets.[39]

To move scouting data quickly to strike elements, the Air Force established a Time-Sensitive Targeting Cell (TSTC) at Prince Sultan Air Base in Saudi Arabia. For example, the air attack on the Ba'ath Party headquarters where General Ali Hassan al-Majid, the dreaded cousin of Saddam Hussein known as "Chemical Ali," was reported to be located was executed in less than half an hour.[40] The general was spotted heading into his villa by a British special operations soldier; the information was relayed to the TSTC, which brought up the villa image on a computer screen and selected an F-16 strike aircraft; and the villa was destroyed by several PGMs. In some instances, the TSTC was able to put bombs on target within twenty minutes of being alerted by intelligence. In all, coalition air forces struck nearly 700 targets based on dynamic retargeting during the operation in support of ground forces, and carried out more than 150 missions against time-sensitive targets (i.e., leadership, WMD and terrorist targets).[41]

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[39] Douglas Jehl, "Digital Links Are Giving Old Weapons New Power," *New York Times*, April 7, 2003, p. 2.

[40] Tom Bowman, "Strike Team Advances Precision, Pace of War," *Baltimore Sun*, April 20, 2003, p. 1A. Al-Majid earned his nickname for ordering poison gas attacks against thousands of Kurds, including women and children, in 1988. Despite the relatively prompt strike, the General survived the attempt to kill him. He was finally captured in August 2003.

[41] Bowman, "Strike Team Advances Precision, Pace of War," p. 1A. According to US Central Command Air Forces (USCENTAF), US aircraft conducted 156 missions against time-sensitive targets and 686 missions involving

SPECIAL OPERATIONS FORCES

Special operations forces, inserted in small numbers in hostile territory, proved an invaluable ground complement to the airborne sensors, identifying enemy locations and movements, relaying information to headquarters and directing strikes against enemy forces and facilities.

As Army Major General Stanley McChrystal, Vice Director of Operations for the Joint Chiefs of Staff, observed, Operation Iraqi Freedom represents "probably the most effective and the widest use of special operations forces in recent history."[42] To be sure, nearly 500 US SOF deployed to Afghanistan during Operation Enduring Freedom. They dominated US ground force operations during the key early stages of the campaign. In the Second Gulf War, however, the number of special operations forces deployed increased by well over an order of magnitude, to nearly 10,000.

Generally ignored for most of the First Gulf War, SOF units (and CIA paramilitary elements) were an integral part of the campaign to depose Saddam Hussein. Just before the war formally began, large numbers of US SOF from the Air Force, Army and Navy SEAL teams, Polish Special Forces, the British and Australian Special Air Services and CIA paramilitary teams covertly infiltrated Iraq. Their mission: secure bases in western Iraq, link up with Kurdish rebels in the north and prepare to seize key parts of the Iraqi economic infrastructure once the shooting started. These efforts were crucial, since a principal coalition objective was to effect regime change while preventing Saddam from destroying the nation's infrastructure. No amount of precision strikes alone could accomplish this mission. Ground forces would be needed to secure key sites. Risks would have to be taken. In this regard, SOF, combined with prompt, persistent surveillance and precision air power, demonstrated that it is possible to rescue a people and an economy from their own regime.

Once the shooting began, Special Forces pursued an "inoculation strategy," executing commando raids to prevent the Iraqis from destroying key infrastructure targets, such as oil wells, bridges, dams and dikes. For example, SOF units secured the key Haditha Dam, which CENTCOM feared the Iraqis might destroy to flood the lower Tigris and Euphrates River Valley, including the battlefield. At the same time, Navy SEAL teams and Polish commandos seized offshore oil terminals, while also helping to establish control over the northern Persian Gulf, essential to the movement of war supplies and humanitarian relief cargo. American and Australian SOF operated deep in Iraq to seize or destroy suspected Iraqi WMD sites or command centers. American, British and Australian SOF also patrolled Iraq's western desert to thwart any Iraqi attempt to launch missiles at Israel.

American SOF also went "quail hunting," conducting harassing raids designed to flush out Iraqi military units, which then became targets for US air strikes. Indeed, air power proved to be the Special Forces' trump card. In executing their missions, SOF were linked to persistent

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dynamic targeting. Lt. Gen. T. Michael Moseley, "Operation Iraqi Freedom—By the Numbers," USCENTAF Assessment and Analysis Division, April 30, 2003, p. 9.

[42] Jack Kelley, "Covert Troops Fight Shadow War Off-Camera," *USA Today*, April 7, 2003, p. 2.

surveillance platforms such as UAVs, while Air Force and Navy strike aircraft, along with AC-130 gunships, remained on call.

Coordination between SOF and other coalition ground elements was also in evidence. In one instance, SOF were provided with several Abrams tanks to assist them in interdicting the highway between Baghdad and Tikrit, a key center of Ba'ath Party support in northern Iraq. In another key operation, fewer than 100 US SOF coordinated Kurdish fighters and US air strikes in a successful attack on the Ansar-al-Islam terrorist enclave on the Iraqi-Iranian border. SOF sniper teams evidently operated in Baghdad and other cities, looking for high-value targets such as Iraqi leaders. To the Iraqis, SOF seemed to be everywhere and yet nowhere in particular.

PRECISION STRIKE

"Never in the history of warfare has this much precision air power been applied in such a compressed period of time."

Colonel Mace Carpenter, CENTCOM Chief of Strategy[43]

The US military's use of precision strikes showed just how far it had come since Desert Storm. In that conflict, the US military relied principally on LGBs and Tomahawk land-attack cruise missiles (TLAMs) for precision strikes. These munitions, remarkable as they were, had limitations. LGBs, for example, could not be employed against targets obscured by smoke, a problem considering the Iraqis had set Kuwait's oil fields ablaze. Nor could LGBs be used in poor weather. Making matters worse, only about 20 percent of US aircraft were equipped to illuminate their targets with the laser energy by which LGBs guide themselves to their target.[44] The Navy's TLAMs were limited by their terrain contour matching (TERCOM) guidance system, which used key geographic features as reference points.[45] These terrain features, such as mountains or buildings, were hard to come by crossing the deserts of Iraq. Consequently, some TLAMs actually overflew Iran on their way to Baghdad.

In Operation Iraqi Freedom, nearly all US combat aircraft were capable of employing PGMs autonomously. Moreover, the US PGM inventory now included weapons that exploit satellite navigation guidance—the US GPS constellation—to enable strikes in all kinds of visibility and weather. The 5,000-lb. LGBs developed during the First Gulf War for deeply buried targets were now available in numbers and could utilize either GPS or laser guidance. Some of the new PGMs could also strike with increased effectiveness against deeply buried targets. These capabilities either did not exist, or were fielded only at the last moment, during the First Gulf War.

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[43] Toby Harnden, "'Fight Light, Fight Fast' Theory Advances," *London Daily Telegraph*, April 14, 2003, p. 1.

[44] John H. Cushman, Jr., and Thom Shanker, "A Nation at War: Combat Technology," *New York Times*, April 10, 2003, p. 5.

[45] Other TERCOM shortfalls include its relatively high cost compared to GPS and its inability to permit retargeting of the TLAM once it has launched.

The result was that the Second Gulf War witnessed the use of precision bombardment on a scale and intensity unsurpassed in the history of warfare. Of the roughly 29,000 bombs and missiles dropped by US forces, nearly 70 percent were smart—an order-of-magnitude percentage increase over Desert Storm.[46] Of great importance, these munitions enabled the US military to wage a campaign that was both ferocious and discriminate. This point is made clear when one realizes that US forces used only a little more than 9,000 unguided munitions in Operation Iraqi Freedom, while it used more than 210,000 of these "dumb" bombs in the First Gulf War.[47]

The growing reliance on all-weather PGMs, like the JDAM, was also apparent. Some 33 percent of all PGMs employed were all-weather capable. All-weather, precision air strikes were responsible for most of the destruction of Iraqi Republican Guard divisions. Within less than two weeks, the two reinforced divisions defending Baghdad were reduced to substantially less than 50 percent of their original combat strength.[48] The Medina Division, located southwest of Baghdad, was reportedly reduced to below 20 percent of strength.[49] Of the 800-plus tanks that the Republican Guard fielded at the start of the war, "all but a couple of dozen" were destroyed by air strikes or abandoned by the third week of the war.[50] A significant portion of this attrition took place during a severe, three-day sandstorm that reduced the effectiveness of laser- and electro-optically guided weapons, thus necessitating the use of all-weather PGMs.

Joint Integration

The close integration of precision air strikes and ground combat operations—known in military parlance as "joint" operations—proved essential to another critical element of the campaign: the need for ground forces to move quickly to seize Iraq before Saddam could destroy it. In this regard, SOF could only do so much. Sizeable conventional ground forces were needed. Air and ground forces, which had fought essentially separate wars in Operation Desert Storm in 1991, were now integrated to a higher degree than ever before. By relying on precision air strikes, CENTCOM was able to slim down the US ground force element to a single heavy division, one light division and two light brigades. This represents only about one-third the force required for the far less ambitious mission of evicting Iraqi forces from Kuwait during the First Gulf War, and only about half the size of the ground force called to deal with this contingency in the defense reviews of the 1990s.

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[46] Moseley, "Operation Iraqi Freedom—By the Numbers," p. 11.

[47] Ibid., and Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey Summary Report* (Washington, DC: US Government Printing Office, 1993), p. 226.

[48] General Richard Myers, *DoD News Briefing*, April 1, 2003. See also Bradley Graham, "U.S. Air Attacks Turn More Aggressive," *Washington Post*, April 2, 2003, p. 24; and John Diamond and Dave Moniz, "Air Campaign Shifts Aim to Guard," *USA Today*, April 2, 2003, p. 4.

[49] Rick Atkinson, Peter Baker and Thomas E. Ricks, "Confused Start, Swift Conclusion," *Washington Post*, April 13, 2003, p. 1.

[50] General Richard Myers, *DoD News Briefing*, April 7, 2003. Reflecting on the rapid destruction of Iraqi tanks, armored personnel carriers, tracked vehicles and enemy positions by precision air power, Colonel Michael Longoria, commander of the Air Force's 484th Air Expeditionary Wing, commented, "when you can destroy over three divisions worth of heavy armor in a period of about a week and reduce each of these Iraqi divisions down to even 15, 20 percent of their strength, it's going to have an effect." Stephen Hedges, "Air War Credited in Baghdad's Fall," *Chicago Tribune*, April 22, 2003.

The smaller the force that is deployed, the less demand there is for supplies. The fewer supplies required, the easier it is to sustain supply lines, and the more rapidly the force can advance. The result was one of the most rapid ground force advances in the history of warfare, as the Army's 3rd Infantry Division covered more than 250 miles in three days.

Even before US ground troops came into contact with Republican Guard units, these elite Iraqi formations were subjected to punishing attacks by Air Force, Marine and Navy aircraft, just as they had been in 1991. When the Iraqis sought to conceal their forces, US ground troops found ways to reveal their location. One method was the SOF "quail-hunting" operations mentioned above. Another involved probing operations by the main American ground forces. For example, as the 3rd Infantry Division began to maneuver along the approaches to Baghdad, it conducted a series of feints across the Euphrates River during a dust storm. This tactic forced the Medina Republican Guard Division to start repositioning its forces to counter this apparent American advance between the Tigris and Euphrates rivers. Coalition reconnaissance aircraft started getting reports of enemy armor moving on trucks, of Iraqi artillery forces repositioning and of attempts by the Medina Division's brigades to occupy what they believed would be optimum defensive positions. Alerted, the Air Force began, in the words of US V Corps commander Lieutenant General William Wallace, "whacking the hell out of the Medina [Division]."[51]

Supporting the US ground forces' advance for the first time was the sensor-fused weapon (SFW), which dispenses heat-seeking bomblets that float down by parachute. Each bomblet releases ten warheads that spew out four "skeet" armor-piercing weapons that descend by parachute, scanning the battlefield with infrared sensors designed to detect armored vehicles. Upon detecting targets, these smart submunitions fire explosively formed penetrator slugs that strike tanks from above, where their armor is weakest. The 40 skeets within a single SFW can search for and engage stationary and mobile ground combat vehicles within a 30-acre area.[52] The SFWs released from a Wind-Corrected Munitions Dispenser (WCMD) dropped by a B-52 bomber on April 2, 2003, were the first use of these munitions in combat.[53]

Consequently, by the time the 3rd Infantry Division reached the outskirts of Baghdad, only about a dozen Iraqi tanks opposed it. They were quickly dispatched in what may have been the only traditional tank encounter of the war.

The Dawn (and Twilight?) of "Shock and Awe"

The demonstration of PGMs' potential to enhance the military effectiveness of those who possess them in significant numbers has produced a lively discussion among military theorists and strategists as to whether the long-awaited advent of strategic aerial bombardment as the

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[51] Kitfield, "Attack Always," pp. 1292–1296.

[52] See the Textron Systems Corporation's website at www.systems.textron.com/sfw.htm. See also Glenn Goodman, "Tank Eradicators," *Armed Forces Journal International*, August 2000, pp. 38–39.

[53] Stephen Trimble, "Pentagon Eyes Larger Role for Battle-Tested Sensor Fuzed Weapon," *Aerospace Daily*, April 9, 2003, p. 4; and "WCMD-Equipped Sensor Fuzed Weapons Dropped on Iraqi Vehicle Column," *Defense Daily*, April 3, 2003, p. 1.

central element in warfare has arrived. To be sure, in one sense it came of age a half-century ago with the accumulation of sizeable nuclear arsenals. However, the enormous destructive power of nuclear weapons has thus far made those who possess them fear to use them. Do precision munitions represent a new and, perhaps more important useable form of strategic air power? Could they be employed against targets comprising an adversary's center of gravity in such a way as to produce a prompt, decisive victory? To many air power advocates, the allure of executing massive precision strikes that so totally unhinge an enemy's ability to resist—filling him with a sense of "shock and awe"—is compelling.

However, despite the initial ferocity of the coalition's aerial bombardment, Operation Iraqi Freedom did not produce the prompt collapse of Saddam Hussein's regime. Indeed, in retrospect, if any group could be said to have been shocked and awed by the initial coalition air operations, it would be certain segments of the media. This is not to say that the strikes were without effect. It seems likely, for example, that they seriously disrupted Saddam Hussein's command and control over his forces, contributing to a fatal breakdown in their ability to coordinate their actions effectively.

Moreover, the concept of precision strategic strikes yielding prompt, decisive results may already be passing into history for several reasons. First, such strikes require a level of intelligence support that did not exist in the Second Gulf War, and that may not be achievable.[54] Perhaps even more important is the character of the conflict. If the United States is waging war on regimes and not peoples, then it may be counterproductive to strike the full range of targets required to induce a rapid collapse of the adversary's ability or will to continue the fight. This problem will no doubt endure as adversaries persist in their efforts to complicate US precision strikes by collocating key assets close to or inside structures such as mosques, schools, hospitals and other sites that are considered out of bounds, or to burrow ever deeper underground beyond the effectiveness of even the most formidable earth-penetrating precision-guided munitions.

Still another factor working against prompt victory through strategic precision strikes concerns the character of the conflict itself. If the US objective is regime change, it is hard to imagine what level of precision bombardment, no matter how intense, will convince an adversary's leadership to yield. For a tyrant such as Slobodan Milosevic or Saddam Hussein, yielding not only represents a loss of power, it also implies a high risk of either death at the hands of his own people or a trial on charges of human rights violations. Finally, one lesson that the Second Gulf War appears to have reinforced is the importance of acquiring nuclear weapons as a counter to US precision warfare. As more states acquire nuclear weapons, they may secure sanctuary status

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[54] Since the dawn of air power in the early 20th century, military planners have sought to identify that set of targets that represent the enemy's center of gravity—that is, those targets that, if disabled in an air campaign, would break either the enemy's capability or will to continue his resistance. Despite their best efforts, this goal has proved elusive. In the Second Gulf War, the US air forces had ample precision-strike capacity to destroy with relative speed any significant Iraqi target set. What they appeared to lack, despite their overwhelming military superiority, was an understanding of what target set comprised the Iraqi center of gravity and/or where its elements might be located at any given time (e.g., the location of Saddam Hussein and other key Iraqi leaders). Consequently, victory in the Second Gulf War was achieved the "old-fashioned" way: the enemy's army was defeated and his capital occupied.

from US attack, including the kind of aerial bombardment that shock and awe proponents advocate.

Friendly Fire

Will the maturing of precision warfare substantially reduce the percentage of casualties inflicted by friendly forces? The data available thus far indicates it might. Preliminary data shows United States forces made progress in the ability to minimize mistakenly attacking each other, a phenomenon known as "friendly fire" or "blue-on-blue" engagements. Through the end of April 2003, US and British casualties totaled 169 deaths, of which 137 were American. To date, estimates are that 11 deaths in the Second Gulf War were the result of friendly fire. During the First Gulf War, the United States suffered 148 battle deaths, the British 24. Thirty-five US deaths and nine of the British fatalities were the result of friendly fire. In sum, 25.6 percent of those killed in action during Operation Desert Storm were the result of blue-on-blue engagements, versus only 6.5 percent during Operation Iraqi Freedom.[55]

As with other preliminary data emerging from the conflict, one must be cautious in drawing too sweeping a conclusion as to how much progress has been made in reducing friendly fire casualties. Still, the reduction appears dramatic. Moreover, the results are all the more impressive given the way coalition forces conducted their operations. In the First Gulf War, coalition ground forces advanced along a linear front. That is, they advanced as part of a long, continuous line. Troops had a relatively good idea as to where the front lines were. The situation was far different and far more difficult, from a friendly fire perspective, in the Second Gulf War. Operation Iraqi Freedom saw SOF moving about in small "clumps" far behind enemy lines. The main body of ground forces advanced, not in linear fashion, but in a column or spearhead, leaving pockets of enemy troops in their wake. The effect was to blur the distinction between front lines and rear areas. Finally, as noted earlier, with time at a premium on the battlefield, great emphasis was placed on striking targets quickly, increasing the risk of mistaking a friendly unit for an enemy formation. Yet despite all of this, friendly fire casualties apparently were reduced substantially.

The most likely explanation for this is the improvements made in linking US forces together as part of a network. For example, in Operation Iraqi Freedom, the Army incorporated its Force XXI Battle Command Brigade and Below (FBCB2) system into thousands of combat vehicles (e.g., tanks, infantry fighting vehicles, Apache Longbow attack helicopters and High Mobility Multipurpose Wheeled Vehicle System).[56] The FBCB2 is a mobile system of networked computers, radios, satellites, transponders and software. More than 1,000 US Army and Marine, as well as British, ground platforms, such as tanks, were fielded with the equipment.[57] The

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[55] Oscar Avila, "Allies Won with Few Casualties," *Chicago Tribune*, May 3, 2003; Peter Pae, "'Friendly Fire' Still a Problem," *Los Angeles Times*, May 16, 2003, p. 1.

[56] As its name indicates, the FBCB2 system is integrated primarily into vehicles at the brigade echelon and below. For theater-wide command, control and communication purposes, however, elements of the FBCB2 system are available at the division and corps levels.

[57] William New, "Toward a Networked Military," *National Journal's Technology Daily*, April 7, 2003.

FBCB2's purpose is to ensure that friendly ground forces know each other's location, to minimize friendly fire casualties.[58]

Perhaps even more important, hundreds of SOF deployed behind Iraqi lines wore Grenadier Beyond Line of Sight Reporting and Targeting (BRAT) miniature transmitters, enabling headquarters units hundreds of miles away to know their location.[59] This not only reduced the danger of "blue-on-blue" kills, it also facilitated coordination between SOF units and conventional coalition forces. As the Pentagon pursues an expansion in the size of the SOF, and as the Army and Marine Corps shift away from linear to nonlinear operations, advances such as these will be important in reducing the risk of friendly fire casualties.

Finally, the one area that may be lagging in terms of reducing friendly fire casualties concerns air operations, where US Patriot interceptor missiles shot down two coalition aircraft.[60] While the cause of these blue-on-blue kills has not yet been fully determined, it seems likely that improvement in this area of military operations is needed.

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[58] The FBCB2 system also allows individual vehicles on the network to exchange voice, video or other data securely and to gain access to terrain maps, logistics information and, most important, a shared situational awareness display indicating the location of friendly and enemy units. The 4th Mechanized Infantry Division was the first Army unit to be equipped with the FBCB2 system and has been experimenting with various preproduction models for more than three years. So far, the Army has purchased 8,000 FBCB2 units for testing and evaluation. Kim Burger, "U.S. Army Shares Radios to Avoid Gulf Fratricide," *Jane's Defence Weekly*, March 12, 2003, p. 3. Only the 4th Infantry Division, however, is equipped with the software and hardware to support the wireless tactical Internet feature of the FBCB2 system. Assuming that no major problems surface during testing, the Army plans to install some 60,000 FBCB2 systems into all types of combat vehicles over the next two decades. See Peter Pae, "War Is Hand-Held on Battlefield of the Future," *Los Angeles Times*, April 27, 2001, n.p.

[59] The Grenadier BRAT system comprises a handheld GPS receiver linked to a compact, two-pound satellite transponder. Every few minutes, the system transmits the user's GPS coordinates over a secure, difficult-to-detect satellite link, the data are processed at a centralized ground station and then the composite data are sent to field commanders over military ultra high-frequency satellites. As of April 2003, some 1,500 Grenadier BRAT units had been deployed to both Afghanistan and Iraq. Future versions of the Grenadier BRAT system will also be able to process and uplink the precise coordinates of enemy targets pinpointed with integrated laser range finders. Jeremy Singer, "Satellite-Based System Will Make U.S. Troops Safer," *Space News*, April 28, 2003, p. 11.

[60] Andrea Stone, "Patriot Missile: Friend or Foe to Allied Troops?" *USA Today*, April 15, 2003, p. 6.

IV. THE BATTLE OVER THE LESSONS OF IRAQ

"I don't mind generals planning for the last war as long as they are all on the other side."

Arthur Cebrowski, Director, Office of Force Transformation[61]

The battle for Iraq is over. The battle among the Services for pride of place and budget share has begun. It will be informed by an internal Operation Iraqi Freedom "lessons learned" effort by Joint Forces Command. As noted earlier, the military is now in the difficult position of evaluating its own performance. Recent postconflict reviews have stimulated discussion over so-called low-density/high-demand (LD/HD) systems and capabilities. The argument is that certain capability areas exist for which the demand exceeds the supply (or "density"). Secretary of Defense Rumsfeld has stated that the term "LD/HD" is simply a euphemism for "things we didn't buy enough of."[62] Less attention is typically paid to what might be called "high-density/low-demand" capabilities—those the US military possesses (or is planning to field) that are becoming less relevant, in light of observable trends in warfare.

This section offers some preliminary observations with respect to some of the more notable LD/HD systems and capabilities. The principal focus is not only on how they performed in Iraqi Freedom, but also on deriving a sense of how well they might perform in the kinds of contingencies that seem both likely and particularly challenging.

LOW-DENSITY/HIGH-DEMAND CAPABILITIES

Persistent Surveillance: UAVs and SOF

In the Second Gulf War, the US military continued the trend toward increased reliance on UAVs for ISR operations and for certain strike operations as well. During Operation Iraqi Freedom, Global Hawk UAVs provided imagery of Republican Guard divisions, which was transmitted to the Combined Air Operations Center, whereupon target locations were relayed to strike aircraft. Once again armed Predators attacked high-value targets. Persistent surveillance from UAVs in Iraq's western desert supported SOF operations designed to prevent the Iraqis from launching any Scud missiles they might have hidden. In the words of one US officer, the UAVs, along with other ISR aircraft, represented "A ruthless, staring constellation looking at Baghdad."[63]

Given their performance in three recent conflicts, the role of UAVs seems certain to expand in the future. However, if and when enemy air defense systems become more formidable and the anti-access threat matures, the US military will likely require a significant number of stealthy, extended-range UAVs to maintain the kind of persistent surveillance it found so valuable in

[61] Fulghum, "Fast Forward," pp. 34–35.

[62] Donald Rumsfeld, "21st Century Transformation of the US Armed Forces," prepared remarks, January 31, 2002.

[63] Ibid.

Operation Iraqi Freedom. At present, the ability of US forces to strike at extended ranges far exceeds their ability to conduct surveillance at such ranges.

As noted above, SOF played a minor role in Operation Desert Storm but a key role in Operation Iraqi Freedom. On the basis of early reports, it seems likely that SOF played an important role in enabling the persistent surveillance that made it so difficult for Iraqi forces to move without being detected and engaged. The use of SOF in this role may increase if the anti-access/area-denial threat precludes the rapid movement of ground forces into a threatened region. Specifically, covertly inserted SOF could perform a key scouting mission to identify enemy anti-access force elements, such as ballistic and cruise missile launchers.

Bombers

Bombers have performed impressively in all major recent US military operations, and the Second Gulf War proved no exception. Operation Allied Force in the Balkans marked the B-2 bomber's debut in 1999. During the 78-day conflict, the B-2s comprised 1 percent of the attack sorties but dropped 11 percent of the bombs. In military operations against Afghanistan, the bomber force flew 20 percent of attack sorties but dropped roughly 70 percent of munitions.[64]

Operation Iraqi Freedom saw bombers account for less than 3 percent of the strike sorties but drop approximately 28 percent of all munitions.[65] The bombers' long range and hence extended on-station time and large payload were key to the US ability to conduct sustained, mass, precision attacks against Republican Guard divisions.

Because of the benign air-defense environment (as in Afghanistan), the Air Force was able to orbit bombers overhead to provide on-call precision firepower. In Afghanistan this capability was used initially to support Special Forces and later (in Operation Anaconda) to support Army units when they encountered a force ten times larger than expected. In the Second Gulf War, orbiting bombers provided on-call, precision close air support, which was a crucial factor in enabling the 3rd Infantry Division to advance as rapidly as it did. Of course, operating this way assumes an environment in which enemy air defenses have been neutralized. While this proved to be the case in Afghanistan and Iraq, it may not hold true over the longer term. Again, as the anti-access threat grows over time, the need for extended-range, stealthy strike platforms—be they bombers or UCAVs—seems certain to increase.

Remarkably, despite the bomber force's performance and growing concerns over forward base access, the Air Force plans to buy more than 2,000 tactical aircraft over the next two decades, while it has no plans for fielding a new bomber until the 2030s. The small force of stealthy bombers (21 B-2 aircraft) seems inadequate to support the Air Force's goal of conducting

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[64] William Arkin, "Weapons Total for Afghanistan Includes Large Amount of Cannon Fire," *Defense Daily*, March 5, 2002, p. 12.

[65] Moseley, "Operation Iraqi Freedom—By the Numbers," p. 7; and author's discussion with senior US Air Force official, July 24, 2003.

sustained global strike operations of the magnitude required for large-scale power-projection operations.

Tankers

Just as the difficulties in securing forward base access increased the US military's reliance on bombers, the need to base short-range tactical aircraft at more distant bases increased the need for tanker aircraft to extend their range. As Air Force Secretary James Roche noted, "The only complaint from any Service that I heard was [that] the Navy . . . would like . . . more tankers."[66]

Reliance on tankers has increased substantially since the First Gulf War. In Operation Allied Force and Operation Enduring Freedom, the tanker-to-total-sortie ratio was double and two-and-a-half times that of Desert Storm, respectively. The tanker-to-total-sortie ratio in the Second Gulf War was double that of Operation Desert Storm.[67] The Air Force's tanker fleet, however, is showing its age. At any given time a substantial number of these aircraft are unfit for service. It is clear that the tanker fleet must be modernized. The argument is only made stronger by the Air Force's expanding emphasis on short-range strike aircraft. However, tanker modernization has yet to achieve the necessary priority in the Service's budget.[68]

Stability Operations

"Tomorrow brothers and sisters, and I am not exaggerating or throwing out zealous or sentimental words . . . is the beginning of the end of the American era in Iraq and in the region."

Sheikh Hassan Nasrallah[69]

One clear lesson that has emerged from the coalition operation in Iraq is that postconflict operations, often referred to as stability operations, are likely to prove more challenging for the US military than the war itself. As the earlier discussion on regime change makes clear, this should not be surprising.

For example, aside from internal Iraqi resistance in the wake of Operation Iraqi Freedom, the US military may have to contend with several of Iraq's neighbors, such as Iran and Syria, which

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[66] "Q&A With Secretary James Roche," *Air Force Times*, May 5, 2003, p. 28.

[67] The data are derived from Gulf War Air Power Survey, Volume V: *A Statistical Compendium and Chronology* (Washington, DC: US Government Printing Office, 1993); US Air Force, "Air War Over Serbia Fact Sheet," January 31, 2000; The White House, "Operation *Enduring Freedom*: One Year of Accomplishments," available online at http://www.whitehouse.gov/infocus/defense/enduringfreedom.html. Cited in Christopher J. Bowie, Robert P. Haffa, Jr., and Robert E. Mullins, *Future War* (Washington, DC: Northrop Grumman Analysis Center, 2003), p. 42. See also Moseley, "Operation Iraqi Freedom—By the Numbers," pp. 7–8.

[68] To address the tanker problem, the Air Force has proposed a novel leasing arrangement with the Boeing Corporation that would provide the Service with 100 aircraft built on the 767 airframe. See Steven Kosiak, "Air Force Plan to Lease Tankers Likely to Cost More Than Buying, Set Harmful Precedent," *CSBA Backgrounder*, June 12, 2003.

[69] Faye Bowers, "Why Hizbullah May Be the Next Terror Target for US," *Christian Science Monitor*, April 25, 2003, p. 2.

clearly have no interest in seeing President Bush's vision of a prosperous, pro-US, democratic Iraq emerge out of this conflict. Then there is al Qaeda, which is already at war with the United States. The postwar bombings in Saudi Arabia that killed eight Americans are probably only the first in a series of attacks designed to raise the costs of US involvement in the region beyond those Washington is willing to pay.

American officials have evidence that Hezbollah, a Shi'ite radical Islamic terrorist organization based in southern Lebanon, but with a worldwide network, plans to initiate attacks against US targets throughout the Middle East and beyond. This conclusion is sustained by comments made by the group's leader, Sheikh Hassan Nasrallah, who has declared that "The people of the region will receive [America] with rifles, blood, arms, martyrdom and martyrdom operations."[70] Hezbollah has received as much as $100 million annually in aid from Iran in recent years. The terrorist group has already killed more than 300 Americans.[71] According to CIA director George J. Tenet, "Hezbollah, as an organization with capability and worldwide presence, is [al Qaeda's] equal, if not a far more capable, organization."[72]

Over the past decade the Army, somewhat reluctantly, has found itself increasingly in the business of conducting stability operations. Despite the Service's strong and enduring allergy to these operations following the Vietnam War, the Army has sizeable forces committed to stability operations, including some 3,000 troops in the Balkans and some 11,000 in Afghanistan. Estimates for stability operations in Iraq range from 30,000 or so on the low end to well over 100,000 on the high end. At present more than 140,000 US troops are in Iraq.

This fact, and the experience of the Second Gulf War, implies a reduced need for heavy ground formations and more emphasis on units optimized for stability operations. The Army is currently restructuring its force to reduce overseas deployment time (a brigade combat team anywhere in the world in 96 hours from liftoff, a division within 120 hours, etc.) for Stryker Brigade Combat Teams.[73] While these brigades can be deployed more rapidly than heavy formations, their suitability for stability operations is unclear. For example, many of the skills associated with these operations, such as civil affairs operations, military police and psychological warfare, are concentrated in the Army's Reserve Component and can be considered low-density assets. Moreover, given the success of the heavy Abrams tank in urban operations during Operation Iraqi Freedom, it is unclear that Stryker combat vehicles, with their thin armor, are better suited for the mission of stabilizing urban areas.

What does seem clear, given the number and scale of stability operations in which the Army is involved, the protracted nature of these operations and the Service's other commitments, is that allied support is welcome. In the Balkans, non-US NATO forces bear most of the burden. In

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[70] Josh Meyer, "Hezbollah Vows Anew to Target Americans," *Los Angeles Times*, April 17, 2003, p. 1.

[71] More than 240 of these casualties stemmed from one incident, the 1983 truck bombing of the Marine Corps barracks in Beirut.

[72] Ibid.

[73] US Army White Paper, *Concepts for the Objective Force* (Washington, DC: US Army, November 2001), p. 9.

Afghanistan, there is a sizeable United Nations contingent. Washington has, for obvious reasons, welcomed the participation of British, Polish and other coalition forces in current stability operations in Iraq.

HIGH-DENSITY, LOW-DEMAND

Tactical Aircraft

The tactical aviation arms of the US Air Force, Navy and Marine Corps performed with great distinction in the Second Gulf War. However, the maturation of the US military's precision-strike capabilities threatens to make tactical strike aircraft a victim of their own success. Gulf War experience "showed that for many types of targets, a ton of PGMs typically replaces 12–20 tons of unguided munitions on a tonnage per target kill basis."[74] But only a small percentage of the US military's strike aircraft were fully equipped to employ PGMs autonomously during the First Gulf War. Over the past twelve years, the US military's aggressive fielding of PGMs, and the modification of nearly every strike aircraft to employ them, has greatly enhanced the strike force's effectiveness. Thus, while Operation Desert Storm employed some 1,600 American tactical strike aircraft, Operation Iraqi Freedom required less than half that number.[75]

The reduced reliance on tactical aircraft can also be attributed to the difficulty in obtaining access to forward air bases. For example, indications are that as many as 100 tactical strike aircraft were relegated to the sidelines when Turkey refused to permit operations out of Incirlik. In addition, the absence of any serious Iraqi air defense threat left the Air Force's fighters with little to do. Indeed, both bombers and tactical aircraft functioned largely as "bomb trucks" during the Second Gulf War. As enemy air defenses improve, however, the need for stealthy aircraft will likely increase.[76]

In partial recognition of these trends, the Air Force is adapting its new F-22 air-superior fighter, which was originally designed to fight from secure forward bases in a European environment, into a ground-attack aircraft, the F/A-22. This is likely to prove an expensive proposition of questionable merit. The Service is also exploring a further overhaul to the F/B-22's design to extend its relatively modest range. Both plans will take a substantial bite out of the Service's budget, at the expense of other important priorities. An even greater drain on the US defense budget will occur when the F-35 Joint Strike Fighter enters production, now scheduled for the

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[74] Alexander H. Flax and John S. Foster, Jr., "Report of the Defense Science Board Task Force on Tactical Air Warfare" (Washington, DC: Office of the Under Secretary of Defense for Acquisition and Technology, November 1993), p. 17.

[75] Moseley, "Operation Iraqi Freedom—By the Numbers," p. 6.

[76] Interestingly, tactical strike aircraft have been primarily employed in the ground attack role. Prior to the advent of precision strike, these aircraft, whose speed enabled them to fly lower and use visual targeting, had clear advantages over bombers. With precision strike now possible, however, the bombers' advantage in range, loiter time, bomb load capacity and flexibility has greatly increased their value. (I am indebted to Michael Vickers for these insights.) However, stealth bombers are so few in number that the loss of even a few could seriously degrade US precision-strike forces in an anti-access environment. Moreover, lack of numbers limits the Air Force's ability to provide such support to widely dispersed forces.

latter part of this decade. More than 2,000 of these aircraft are scheduled to be procured, with the overwhelming majority requiring fixed, forward-base access.[77]

Heavy Ground Formations

"Clearly warfare is changing. Large force-on-force groups are not . . . the wave of the future."

Admiral Edmund Giambastiani, Commander, Joint Forces Command[78]

The Second Gulf War brought to a head a debate that had been ongoing since Operation Desert Storm. It concerns the future role of heavy armored, mechanized ground forces. These forces, which have been central to conventional land warfare since the German Army introduced the blitzkrieg in the early days of World War II, have found their dominance, if not their relevance, increasingly questioned. Air power advocates argue that the advent of precision air power represents a powerful strike arm that can devastate any enemy armored force at a distance, before ground forces come into direct contact with them. Operation Iraqi Freedom provided support for this argument.

The operation was undertaken with just one heavy Army division, the 3rd Infantry Division (Mechanized). Also committed were the 1st Marine Division, the Army's 101st Airborne Division (Air Assault) and two Army airborne brigades, one from the 82nd Airborne Division, the other being the 173rd Airborne Brigade. Although post–Desert Storm analysis indicated that five Army divisions would be needed to defeat Iraq, in Operation Iraqi Freedom the Army conducted a far more ambitious operation than in the First Gulf War with essentially two and two-thirds divisions. Like the tactical air forces, heavy Army ground forces are becoming both victims of their own success and prisoners of their own limitations. In the case of the former, the US military clearly possesses a surplus capability when it comes to killing tanks, particularly given the spread of precision anti-tank munitions (like the newly introduced sensor-fused weapon), the dominance of the Army's Abrams tank and the superior training of American tank crews. Following the Army's mopping up of the remnants of the Republican Guard tank formations in the wake of US precision air strikes, it is difficult to imagine with whom the Army might fight its next major tank battle—or, perhaps more to the point, what adversary would seek to challenge US supremacy in armored warfare.

The limitations of heavy divisions are also evident, a consequence of their long deployment timelines and enormous logistics requirements. The US military cannot count on the long buildup periods that characterized both Gulf Wars to move heavy ground forces into position and establish the logistics stocks required to sustain them. Recognizing this, the Army is modernizing two of its heavy divisions and one brigade to maintain its dominance in traditional armored warfare as a hedge against some unforeseen challenge. Its other three heavy divisions are slated

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[77] For a detailed discussion of the problems associated with employing the F-22 and land-based version of the F-35 in an anti-access environment, see Bowie, *The Anti-Access Threat;* and Andrew Krepinevich, Barry Watts and Robert Work, *Meeting the Anti-Access and Area-Denial Challenge* (Washington, DC: CSBA, 2003), pp. 11–28.

[78] Sonja Barisic, "Training in Unconventional Warfare Pays Off, Admiral Says," *ArmyTimes.com*, May 12, 2003.

to be converted at some point to formations that the Army asserts are more relevant for newly emerging challenges, such as deploying in the absence of access to forward bases and conducting operations in urban environments.[79]

[79] The Army is planning to field lighter, more rapidly deployable brigades, called Stryker brigades, over the near to mid-term future. This will be followed by the fielding of the Army's Objective Force, units that are designed to be as rapidly deployable as the Stryker brigades but as lethal and survivable as today's heavy formations. Both of these units will be fielded by converting existing Army brigades. There is, however, little discussion of stability operations in the Army's transformation plans. Moreover, significant risk exists that the Army will not be able to effect this kind of transformation. See Krepinevich, Watts and Work, *Meeting the Anti-Access and Area-Denial Challenge*, pp. 69–92.

V. CONCLUSION: MEETING TOMORROW'S CHALLENGES

"[*The United States] needs better tools to deal with a state like North Korea that appears to be determined to violate its international agreements . . . .*"

Condoleezza Rice, National Security Advisor to President Bush[80]

"We're going to have a different force laid down and we're going to have to operate in a different way, because there's a world of difference between a hated dictator and a hated dictator with nukes."

Vice Admiral (Ret.) Arthur Cebrowski, Director, Office of Force Transformation, Department of Defense[81]

FAMILIAR THREATS

Improvements in an already dominant US military during the twelve years since the First Gulf War made for a lopsided victory over Iraq in Operation Iraqi Freedom. But genuine transformation of militaries transcends merely becoming more effective in the existing warfare regime; rather, it entails progress toward competing effectively in an emerging warfare regime that promises to be quite different from previous experience. While it offers some tantalizing insights as to what a transformed US military might look like, the Second Gulf War reflects the warfare regime that has dominated since the early days of World War II, when mechanization, aviation and the use of radio and radar transformed warfare. This is due, in part, to the inability (or perhaps unwillingness) of Saddam Hussein's military to present coalition forces with a different kind of challenge from those they had encountered in the past. The Iraqis presented a threat that was even less imposing than in the First Gulf War, when they fielded an impressive air defense network, used their missile forces to strike at extended-range targets such as Israel and possessed huge stocks of chemical weapons.

To be sure, the US military has made impressive strides in recent years in enhancing its capabilities, especially as they pertain to precision warfare and persistent surveillance. But in Afghanistan in 2001 and Iraq in 2003 the United States confronted enemies that employed familiar military capabilities, generally in familiar ways. For example, the challenge of Afghanistan was not one of confronting Taliban and al Qaeda forces employing new weapons or novel tactics. Rather, the problem was principally logistical—projecting power over extended distances and acquiring adequate base access. To be sure, the Afghan War saw SOF directing US precision air strikes against Taliban and al Qaeda forces to devastating effect. This combination of a small SOF ground "footprint," their communications links with manned and unmanned

[80] Joseph Curl, "US Keeps Pre-Emption Doctrine 'Open'," *Washington Times*, May 13, 2003, p. 1.

[81] "Cebrowski: Emerging Global Threats Require New Methods of Operation," *Aerospace Daily*, May 14, 2003.

aircraft and the use of precision weapons to minimize collateral damage was remarkable, even when the enemy's feeble capabilities are taken into consideration. Yet an argument can be made that a similar and even more impressive feat of arms came thirty years earlier, in 1972, when small numbers of US advisors to the South Vietnamese military employed American air power to halt the North Vietnamese Army's Easter Offensive.

Moreover, the remarkable US-led coalition campaign in the Second Gulf War was essentially waged against an Iraqi force whose composition would have been familiar to the German Army more than sixty years ago. In fact, the Iraqi military took a step back from blitzkrieg, employing tanks without air support and generally bereft of adequate communications or intelligence. The Iraqi capabilities that concerned the coalition forces—missiles and WMD—were employed, respectively, in small numbers or not at all. In sum, it is not clear the Iraqi military would have been a match for the Wehrmacht circa 1940, let alone the American military of 2003.

EMERGING CHALLENGES

A measure of just how far the US military has yet to go in terms of transforming to meet emerging threats can be seen in the findings of recent independent blue-ribbon panels on defense, as well as the Pentagon's own 2001 strategy review. In 1997, for example, the National Defense Panel commissioned by Congress voiced concerns that the proliferation of ballistic and cruise missile technology would enable even small states to hold the forward air bases and the major ports used to resupply US troops at high risk of destruction.[82] The problem would be even more acute if the enemy had WMD—chemical, biological or nuclear weapons. This challenge exists today in nascent form in North Korea, is emerging in Chinese deployments of advanced short-range ballistic missiles and SAMs opposite Taiwan and is likely to emerge before long in Iran.

The Pentagon's 2001 Quadrennial Defense Review echoed this concern and also called upon the military to address what is known as the area-denial challenge, particularly in littoral waters where US power-projection forces will eventually be faced with land-based military forces, such as missiles and aircraft, and coastal forces, such as advanced antiship mines, submarines and small combatants (perhaps masquerading as commercial vessels), equipped with very lethal high-speed antiship cruise missiles.[83] This threat was not encountered in the Second Gulf War. However, a major US joint field exercise conducted in the summer of 2002 saw more than a dozen ships in a US Navy battle group damaged or destroyed by an adversary equipped with area-denial capabilities markedly similar to those projected for Iran.[84] In fact, the problem of securing narrow waters is potentially most acute in the Persian Gulf, through which passes much of the world's oil supplies.

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[82] National Defense Panel, *Transforming Defense* (Washington, DC: Department of Defense, December 1997), p. 13.

[83] Department of Defense, *Quadrennial Defense Review Report* (Washington, DC: Department of Defense, September 30, 2001), pp. 30–31.

[84] "Ex-General: War Game Rigged," *Washington Post*, August 17, 2002, p. A06; and "In Simulation, Navy Suffers Heavy Losses, Including Aircraft Carrier," *Inside the Navy*, August 26, 2002, p. 1.

In 2000, the Hart-Rudman Commission warned of the threat of catastrophic terrorism to the US homeland.[85] The "democratization" of destruction will likely enable even small groups to bring about enormous destruction and loss of life, as Americans discovered to their horror on 9/11. Yet the United States is in only the early stages of determining what mix of military capabilities can best help preempt terrorist strikes before they occur, defend effectively against those under way and limit the damage from those that do occur.

There are still other challenges reflecting an era of revolutionary change in the conduct of warfare. Access to space is becoming ubiquitous. How will the US military deny an enemy access to space capabilities in the event of crisis or conflict? Nuclear weapons are proliferating. How might a collapsing state's WMD be secured before they fall into the wrong hands? The United States has the world's most advanced and, by some accounts, apparently one of the most vulnerable information infrastructures. How will it be defended? Operation Iraqi Freedom offers few clues as to how to prepare for these emerging challenges.

Opportunities exist as well. For example, as noted above, the Army is seeking to transform itself from a heavy, mechanized-dominated force to a lighter, yet still highly lethal force by exploiting information technologies to field a distributed, networked force whose success relies more heavily on information, speed of action and mobility. If the Army succeeds in fielding these types of ground forces, they could prove key to defeating the anti-access threat. The Navy similarly seeks to deploy a networked battle fleet that will include clusters of small, littoral combat ships, unmanned underwater vessels and sensor arrays, along with a greatly increased capacity for precision strike (e.g., the SSGN),[86] as essential capabilities for defeating the area-denial threat.

UNANSWERED QUESTIONS

One of the most disturbing issues emerging from the Second Gulf War is the US military's unwillingness to undertake a critical examination of what happened during the conflict and why. The United States has engaged in three wars since 1991 and has failed to undertake an objective, independent assessment of any of them. Instead, each of the Services was, in effect, allowed to write its own report card after Serbia and Afghanistan, and the same approach appears to have been quietly accepted in the case of the Second Gulf War. Moreover, the degree of jointness or all-Service combined arms seemingly exhibited in the conduct of Operation Iraqi Freedom cries out for the Secretary of Defense, rather than any one service, to establish an independent survey. The apparent reluctance to initiate such a survey is hardly characteristic of an adaptive, innovative organization striving to "transform" itself to meet the challenges of a new era. Congress's unwillingness to assert its responsibilities in the matter is equally lamentable. Finally, while "transformation" has become a key concept underlying current defense planning efforts, it

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[85] The United States Commission on National Security/21st Century, *Road Map for National Security: Imperative for Change* (Washington, DC: n.p., March 15, 2001).

[86] The Nuclear Powered Guided Missile Submarine (SSGN) is a Trident fleet ballistic missile submarine converted to carry conventional missiles. An SSGN would, for example, be capable of carrying over 150 Tomahawk Land-Attack Cruise Missiles.

is important to realize that there are widely divergent views as to what this term means. While an independent, objective survey under Secretary Rumsfeld's auspices might not fully resolve this matter, it could provide an empirical foundation for reaching a more definitive answer.

In the final analysis, given the rather thin gruel of data with which one must work, it can be argued that recent conflicts such as the Second Gulf War offer some tantalizing hints about where the US military could be headed along its transformation path. Yet the war in Iraq appears more reflective of old threats than new challenges. Remarkable as the recent developments in US military capabilities have been, they will not suffice to dominate the very different kinds of threats that are emerging. Despite its recent successes, the Pentagon's motto must be "You ain't seen nothing yet."