

**TOPPLING SADDAM:  
IRAQ AND AMERICAN MILITARY TRANSFORMATION**

**Dr. Stephen Biddle, Study Director  
COL James Embrey, Project Coordinator  
COL Edward Filiberti  
COL Stephen Kidder  
Dr. Steven Metz  
Dr. Ivan C. Oelrich  
LTC Richard Shelton**

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## FOREWORD

Though America's war aims in Iraq are as yet unmet, many now argue that the experience of toppling Saddam poses important implications for American defense planning. But how far can one take this experience in drawing lessons for other potential conflicts? In this monograph, a study team led by Dr. Stephen Biddle of SSI finds important limitations on the Iraq War's lessons for other defense planning challenges. The shortcomings of Saddam's military played an important role in limiting the cost of major combat operations in Operation IRAQI FREEDOM (OIF). Coalition strengths were important contributors, but so were Iraqi weaknesses. In fact, a critical feature of the 2003 outcome was a synergistic interaction between advanced Coalition technology and a major imbalance in the skills of a highly proficient Coalition military and a very poorly trained Iraqi opponent. This synergy enabled a small Coalition force to bring down the Ba'athist regime at a cost far lower than many had feared beforehand. But technology's effects are strongly influenced by its targets' behavior: without the targets' errors to exploit, the same technology can produce very different results. The Iraqis' shortcomings created a permissive environment for Coalition technology that a more skilled opponent elsewhere might not, and this suggests that use of OIF as evidence to fuel many defense transformation proposals could be a mistake. If we cannot guarantee such inept enemies in the future, then we must be cautious in drawing implications from this conflict for force planning. And this suggests that some prominent transformation proposals may have less support in the evidence from 2003 than many now suppose.

The Strategic Studies Institute is pleased to offer this monograph as a contribution to the national security debate on this important topic.

  
DOUGLAS C. LOVELACE, JR.  
Director  
Strategic Studies Institute

## BIOGRAPHICAL SKETCH OF THE LEAD AUTHOR

STEPHEN D. BIDDLE is Associate Professor of National Security Studies at the U.S. Army War College Strategic Studies Institute (SSI). He holds AB (1981), MPP (1985), and Ph.D. (Public Policy, 1992) degrees, all from Harvard University. Before joining SSI in June 2001 he was a member of the political science faculty at the University of North Carolina at Chapel Hill. He has held research positions at the Institute for Defense Analyses (IDA) in Alexandria, Virginia; the Harvard University Center for Science and International Affairs (CSIA); and the Kennedy School of Government's Office of National Security Programs. Dr. Biddle has presented testimony before congressional committees on Operation IRAQI FREEDOM, conventional net assessment, and arms control; served as U.S. Representative to the NATO Defense Research Group study on Stable Defense; and is co-director of the Columbia University Summer Workshop on the Analysis of Military Operations and Strategy (SWAMOS). His publications include articles in *Foreign Affairs*, *International Security*, *Survival*, *The Journal of Politics*, *Security Studies*, *The Journal of Strategic Studies*, *Contemporary Security Policy*, *Defense Analysis*, and *Military Operations Research*; shorter pieces on military topics in *The Wall Street Journal*, *Orbis*, *Joint Force Quarterly*, and *Defense News*; various chapters in edited volumes; and 26 IDA, SSI, and NATO reports. His research has won Barchi, Rist, and Impact Prizes from the Military Operations Research Society. His book *Military Power: Explaining Victory and Defeat in Modern Battle* is scheduled for publication with Princeton University Press in June 2004.

## SUMMARY

The war in Iraq is not yet over, and the critical aim of replacing Saddam with a stable democracy is still unmet. Yet a crucial step in meeting this larger aim has been accomplished: the Ba'athist regime is gone. And it was toppled at much lower cost than many had feared beforehand. Before the war, many feared that Operation IRAQI FREEDOM (OIF) would see an urban street fight with heavy coalition casualties, a protracted siege of Baghdad, a scorched earth campaign with extensive Iraqi economic and environmental damage, or Iraqi use of weapons of mass destruction (WMD). Instead, Saddam was overthrown in just 21 days of fighting, without scorched earth or WMD use, and without prolonged street fighting in Iraqi cities. The coalition loss rate of fewer than one in 2,300 troops killed in action was among the lowest ever for major mechanized campaigns.

What accounts for Saddam's inability to impose a heavier toll? Setting aside for now the prospective cost of rebuilding Iraq, how was the coalition able to oust the Ba'athist regime without incurring the costs so many had feared beforehand? And what do the answers mean for American military transformation and American defense policy generally?

We argue that a central component of the answer lies in a synergistic interaction between advanced coalition technology and a major skill differential. In 2003, advanced technology in skilled hands enabled the coalition to punish Iraqi mistakes with extraordinary severity. The Iraqis in 2003 made many errors, allowing our technology to operate at maximum effectiveness; the resulting lethality enabled a small but skilled coalition force to defeat the world's 12th largest military at very low cost to itself. But technology's effects are strongly influenced by its targets' behavior: without the targets' errors to exploit, the same technology can produce very different results. The Iraqis' shortcomings created a permissive environment for coalition technology that a more skilled opponent elsewhere might not. The 2003 outcome was thus a product of a powerful interaction effect between coalition strengths and Iraqi weaknesses. Our strengths were indeed essential for the outcome, but so were the Iraqis' shortcomings: both advanced technology *and* a major skill imbalance were required.

This explanation holds some very different implications for transformation than the "speed, precision, and situation awareness" view now commonplace in accounts of the war. In particular, we see the nature of the opponent as being at least as important for the outcome as our own strengths: both were necessary but neither was sufficient. Without the skill imbalance afforded by Iraqi shortcomings, we cannot assume that our technology would produce the same results. But if so, then we cannot safely assume that speed, precision, or situation awareness will yield 2003-like effects against more skilled opponents elsewhere. To extrapolate from a case where technology could exploit a massive skill imbalance into future conflicts where our enemies might be better skilled would be a dangerous stretch. And this in turn suggests that a transformation agenda that would trade speed for mass and standoff precision for close combat capability could be a risky choice. Nor does the experience of 2003 demonstrate that major warfare is now so easy for the United States that we can safely restructure the great majority of our forces for peacekeeping, nation building or counterinsurgency. Against enemies as inept as the Iraqis, a fraction of today's military might well suffice for toppling a regime; against others, a balanced military where we can provide both standoff precision fires and conventional close combat capability, en masse if necessary, remains a valuable hedge.

## TOPPLING SADDAM: IRAQ AND AMERICAN MILITARY TRANSFORMATION

The war in Iraq is far from over. An insurgency of unknown scope and prospects now occupies over 100,000 Coalition troops and has already killed more Americans than died in unseating Saddam. The critical war aim of replacing Saddam with a stable democracy is as yet unmet.

Yet a crucial step in meeting this larger aim has been accomplished: the Ba'athist regime is gone. And it was toppled at remarkably low cost.<sup>1</sup> In fact, the realized cost of removing Saddam now seems so much smaller than the prospective cost of rebuilding Iraq that it is easy to overlook what a noteworthy military event the toppling of Saddam was.

Before the war, many feared that Operation IRAQI FREEDOM (OIF) would see an urban street fight with heavy Coalition casualties, a protracted siege of Baghdad, a scorched earth campaign with extensive Iraqi economic and environmental damage, or Iraqi use of WMD (Weapons of Mass Destruction).<sup>2</sup> Instead, Saddam was overthrown in just 21 days of fighting, without scorched earth or WMD use, and without prolonged street fighting in Iraqi cities. The Coalition loss rate of fewer than one in 2300 troops killed in action was among the lowest ever for major mechanized campaigns.<sup>3</sup>

<sup>1</sup> Of course, no war is truly low cost - the men and women who gave their lives paid the ultimate price, regardless of their numbers, and their sacrifice was absolute. Yet some wars are costlier than others, demanding this ultimate sacrifice more widely. A central responsibility of strategy and defense policy is to demand this sacrifice of as few as possible. The fact that the price in human life of Saddam's ouster was far lower than that of most comparable operations has had an important effect on the defense policy debate (see below), and it is in this sense only that the monograph terms the cost of ousting Saddam "low." ("Costs" also include dimensions of cost other than the loss of life, such as economic losses and damage to civilian infrastructure, among others. The analysis below addresses these dimensions separately.)

<sup>2</sup> See, e.g., Bradley Graham, "'Scorched Earth' Plans in Iraq Cited," *Washington Post*, December 19, 2002, pp. A1ff.; Dave Moniz, John Diamond, and David J. Lynch, "A Virtual Certainty: Baghdad Falls. What's Uncertain: Cost of the Fight," *USA Today*, April 4, 2003, pp. 1Aff.; Brad Knickerbocker, "How U.S. Might Counter 'Scorched-Earth' Tactics," *Christian Science Monitor*, December 23, 2002, pp. 3ff.; Dana Priest, "Harsh Iraqi Reaction Expected; Invasion Would Spark Attacks on Israel, Kurds, U.S. Sites," *Washington Post*, February 12, 2003, pp. A18ff.; Michael R. Gordon, "Iraq Strategy is Seen as Delay and Urban Battle," *New York Times*, February 16, 2003, pp. 1ff.; Dave Moniz, "How the War Against Iraq Could Unfold," *USA Today*, February 21, 2003, pp. 1Aff.; Mike Allen, "U.S. Increases Estimated Cost of War in Iraq," *Washington Post*, February 26, 2003, pp. A19ff.; Tom Bowman, "U.S. Plan for Iraq," *Baltimore Sun*, February 24, 2003, pp. 1Aff.; Michael R. Gordon, "Hussein's Likely Plan: Make a Stand in Baghdad," *New York Times*, March 4, 2003, pp. A12ff.; John Daniszewski, "U.S. Risks a Long War if it Invades, Iraqis Warn," *Los Angeles Times*, March 8, 2003, pp. 1ff.; Tom Squitieri, "What Could Go Wrong," *USA Today*, March 13, 2003, pp. 1Aff.; Paul Salopek, "Kurds Fear Saddam Has Already Wired Oil Field," *Chicago Tribune*, March 14, 2003, pp. 11ff.

<sup>3</sup> U.S. casualty figure is drawn from URL: <http://web1.whs.osd.mil/mmuid/casualty/OIF-Deaths-Before.pdf>, downloaded Nov. 10, 2003; UK casualties from URL: [www.cnn.com/specials/2003/iraq/forces/casualties/index.html](http://www.cnn.com/specials/2003/iraq/forces/casualties/index.html), downloaded Nov. 10, 2003; Coalition troop strength in theater is from Pentagon Briefing Transcript, 3/29/03 DoD News Briefing, Victoria Clarke, p. 3. This loss rate was less than one-tenth of the Israelis' in either the 1967 Six Day War or the Bekaa Valley campaign in 1982, less than one-twentieth of the Germans' in their blitzkriegs against Poland or France in 1939-40, and about one-one-thousandth of the U.S. Marines' in the invasion of Tarawa in 1943: Anthony H. Cordesman and Abraham R. Wagner, *The Lessons of Modern War, Vol. I* (Boulder, CO: Westview, 1990), pp. 15, 18, 150; Larry H. Addington, *The Patterns of War Since the Eighteenth Century* (Bloomington, IN: Indiana University Press, 1984), pp. 182, 184, 237; Phillip Karber, et al., *Assessing the Correlation of Forces: France 1940* (McLean, VA: BDM Corp., 1979), BDM/W-79-560-TR, pp. 2-3; George Bruce, ed., *Harbottle's Dictionary of Battles*, Third Edition (New York: Van Nostrand Reinhold, 1981), p. 95. By contrast, the U.S. loss rate in Operation DESERT STORM was less than one in 3000 and was thus lower than OIF's; DESERT STORM constitutes an all-time low for attacker loss rates in major mechanized combat: Stephen Biddle,

The radically low cost of toppling Saddam has had a significant effect on the American defense planning debate. In particular, many advocates of transforming the U.S. military now use Iraq as critical empirical evidence to support arguments for major change in force structure, doctrine, and weapon modernization.

For some, the apparent ease of unseating Saddam is grounds for reorienting U.S. forces toward peacekeeping, nation building, and counterinsurgency. Defeating a hostile military is now the easy job, they argue: American prowess in major warfare is so dominant that regimes can be toppled without the full weight of today's military. Instead, that military should be redesigned to suit the harder job of defeating insurgents and rebuilding societies.<sup>4</sup>

Others focus on future high intensity conflict, but see the way Saddam was toppled as signaling a new form of major warfare for which today's military is poorly designed. They see the low cost of unseating Saddam as the result of unprecedented speed, precision, and situation awareness. Speed kills, they argue: it outmaneuvers and demoralizes opponents, defeating enemies without wholesale piecemeal destruction of hostile forces. And speed coupled with precision and networked information enables the critical fighting to be done at standoff ranges. Together, it is argued, these capabilities allowed a force many saw as undersized to prevail at minimal cost to itself - and could do so again in other places and against other enemies. They see much of the existing U.S. military, however, as left over from the Cold War's emphasis on mass tank battles, and ill-suited to this new way of fighting. Speed and mass, they argue, trade off; if speed is essential and mass is antithetical to this, then it makes sense to reduce mass in order to obtain speed. And today's expensive, labor-intensive close combat capability poses serious opportunity costs against the modernization needed to exploit fully the potential of precision and networked information. To realize the new way of war, they argue, requires a shift away from close combat and toward standoff precision. The resulting transformation agenda would produce a very different U.S. military even without a reorientation toward counterinsurgency, and the apparent success of the new way of war in toppling Saddam gives powerful reinforcement for the associated policy program.<sup>5</sup>

Taken together, these views shape much of the current debate over OIF's meaning for future defense policy. Yet both are problematic. This is because they paint only half

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"Victory Misunderstood: What the Gulf War Tells Us about the Future of Warfare," *International Security*, Vol. 21, No. 2 (Fall 1996), pp. 139-179 at 141-3.

<sup>4</sup> See, e.g., Hans Binnendijk and Stuart Johnson, *Transforming for Stabilization and Reconstruction Operations* (Washington, DC: National Defense University Center for Technology and National Security Policy, 2003); Andrew Krepinevich, *Operation Iraqi Freedom: A First-Blush Assessment* (Washington, DC: Center for Strategic and Budgetary Assessments, 2003), p. 28.

<sup>5</sup> See, e.g., Donald Rumsfeld, Testimony before the Senate Appropriations Subcommittee on Defense, FDCH Transcripts, May 14, 2003, pp. 3; Paul Wolfowitz, Testimony on Iraq Reconstruction, Senate Foreign Relations Committee, Thursday, May 22, 2003, pp. 2, 7; idem., Testimony on U.S. Military Presence in Iraq: Implications for Global Defense Posture, House Armed Services Committee, Wednesday, June 18, 2003, pp. 4-6; Tom Bowman, "Rumsfeld Taunting but Naysayers Persist," *Baltimore Sun*, May 18, 2003; Sonni Efron, "Pentagon Officials Defend Iraq Battle Strategy," *Los Angeles Times*, May 23, 2003; Esther Schrader, "Official Ties Iraq's Troubles to U.S. Success," *Los Angeles Times*, July 9, 2003; Jim Mannion, "Rumsfeld Rejects Case for Boosting Size of Army," *Washington Times*, August 6, 2003; Rowan Scarborough, "Decisive Force Now Measured by Speed," *Washington Times*, May 7, 2003; Usha Lee McFarling, "The Eyes and Ears of War," *Los Angeles Times*, April 24, 2003; Terry McCarthy, "What Ever Happened to the Republican Guard?" *Time*, May 12, 2003; also Max Boot, "The New American Way of War," *Foreign Affairs*, Vol. 82, No. 4 (July/August 2003), pp. 41-58; Andrew Krepinevich, *Operation Iraqi Freedom: A First-Blush Assessment* (Washington, DC: Center for Strategic and Budgetary Assessments, 2003), pp. 13-24, 28, 30-31 (which also emphasizes the importance of Iraqi shortcomings; see analysis below for a more extended discussion of this factor and its role in OIF).

the picture: they focus on our strengths – especially our speed, precision, and situation awareness – but with only passing attention to the Iraqi enemy. Yet Iraqi weaknesses are critically important for understanding the low cost of the 2003 fighting. In 2003, advanced technology in skilled hands enabled the Coalition to punish Iraqi mistakes with extraordinary severity. And the resulting lethality in turn allowed a small Coalition ground force to defeat the world's 12<sup>th</sup> largest military at very low cost to itself. But technology's effects are strongly influenced by its targets' behavior. Without the targets' errors to exploit, the same technology can produce very different results: technology and skill interact in a nonlinear, synergistic way. The Iraqis in 2003 made many errors, allowing our technology to operate at maximum effectiveness; a less permissive opponent could be much harder for a small but swift force to defeat with such low costs. The 2003 outcome was thus a product of a powerful interaction effect between Coalition strengths and Iraqi weaknesses. Our strengths were indeed essential for the outcome, but so were the Iraqis' shortcomings: both advanced technology *and* a major skill imbalance were required.

This account, however, poses very different policy implications than many conventional views. By focusing on our strengths, many transformation advocates implicitly attribute the 2003 outcome to factors we control, and which we can thus replicate in most future conflicts elsewhere. But if the Iraqis' poor skills were also necessary for the 2003 outcome, then we may not be able to ensure such low cost against other enemies in other theaters. The War on Terror has already produced opponents with significantly better skills than the Iraqis: as recently as 2002 in Afghanistan's Shah-i-Kot valley, al Qaeda fighters showed that enemies still exist whose behavior can significantly reduce standoff precision's lethality and compel methodical close combat.<sup>6</sup> Unless we can be sure we will never again fight an opponent with similar skills, it would be dangerous to assume that we can always obtain 2003-like results against future enemies. And this in turn suggests that it would be risky to restructure the U.S. military around an assumption that we can. Instead, a balanced military in which America can provide standoff precision fires *and* conventional, close-combat ground maneuver, en masse if necessary, remains important. A transformation agenda built on trading speed for mass and substituting precision for close combat capability could thus be a dangerous prescription if the tradeoffs are pushed too far on the basis of the 2003 experience. And while counterinsurgency and nation building are clearly important, a military rebuilt for these missions at the cost of undermining major combat effectiveness could leave us unprepared for enemies with better skills than 2003's Iraqis. Either approach rests on a misinterpretation of the 2003 fighting, which offers less compelling evidence for restructuring than either school now claims.

We base this argument on an analysis of original evidence collected in a series of 176 interviews with American, British, and Iraqi participants in the conflict; primary source documentation on the conduct of the war; and the results of direct physical inspection of several of the war's key battlefields.<sup>7</sup> This evidence was collected partly in theater at Baghdad, Hillah, Basra, and Camp Bucca in Iraq, and Camp Doha and Arifjan in Kuwait;

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<sup>6</sup> For details, see Stephen Biddle, *Afghanistan and the Future of Warfare: Implications for Army and Defense Policy* (Carlisle: U.S. Army War College Strategic Studies Institute, 2002), esp. pp. 13-16, 19-21, 26-43; also idem, "Afghanistan and the Future of Warfare," *Foreign Affairs*, March/April 2003, pp. 31-46.

<sup>7</sup> Causal inference from this evidence was undertaken via a combination of process tracing and subunit analysis. On this methodology and its requirements, see, e.g., Gary King, Robert O. Keohane and Sidney Verba, *Designing Social Inquiry* (Princeton: Princeton University Press, 1994), pp. 85-87, 219-223, 225-28.



and partly with returnees at Ft. Carson, Colorado; Fallon Naval Air Station, Nevada; the Pentagon; and Carlisle Barracks, Pennsylvania. The interviewees ranged in rank from Sergeant to Lieutenant General, and include participants from the regular U.S. Army, Air Force, Navy, and Marine Corps; American Special Forces; the British Army; and the Iraqi Regular Army and Republican Guard.<sup>8</sup>

We develop the analysis in seven steps. First, we frame the question for research more carefully and justify our choice. Next, we outline the war's major events. We then assess the role of speed, precision, and situation awareness in the low cost of Saddam's ouster. After this we consider an alternative account - the view that we were lucky to win with such small forces, our technology notwithstanding. Next we turn to the role of skill-technology synergy. We then consider a form of skill that has played an unusually prominent role in the debate: the jointness of Coalition operations. We conclude with some further observations on the implications of our results for Army and defense policy.

### I. Research Question: Explaining the Low Cost of Saddam's Ouster

The analysis below seeks to explain the radically low cost of ousting Saddam, and to assess the relative contribution to this outcome of the major factors cited in today's debate. Why was the cost so low? Why did the prewar fears of urban bloodbaths, scorched earth, or WMD use not come true? What accounts for a nearly unprecedented low Coalition casualty rate?<sup>9</sup>

This is a different - and much more demanding - question than merely "why did the Coalition win" (in the limited sense of toppling Saddam). The latter was overdetermined and widely expected beforehand, probably even by Saddam himself; it was never really in doubt that a war would end Saddam's dictatorship. The key unknown beforehand was the *cost*. And in fact, the cost of victory is the real question in almost all current American planning for major warfare. In a unipolar world, America can always capture a rogue state's capital or depose a hostile regime if it is willing to pay the price and expend the needed effort - the real question is how high a price, and how much effort, is needed. The cost of toppling Saddam is thus the key, not simply the fact of his ouster.

Most important, it is the radically low cost of toppling Saddam that is OIF's key outcome for the transformation debate. This is what persuades many that major warfare is now so easy for America as to warrant restructuring toward other threats, and this is what persuades others that a transformation agenda built around speed, precision, and information would be so powerful. If Saddam had been toppled but prewar fears of a bloody street fight, scorched earth, or WMD use had been realized, today's transformation debate would be very different, and the case for either form of restructuring would lose its most trenchant piece of empirical support. This monograph thus focuses on the relative strength of the hypotheses available in today's debate to explain the radically low cost of

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<sup>8</sup> Audiotapes of these interviews, together with other primary source documentary material collected for the study, have been deposited at the U.S. Army's Military History Institute archive in Carlisle, Pennsylvania, and constitute the MHI Strategic Studies Institute OIF Research Collection, henceforth MHI.

<sup>9</sup> Note that the analysis below is limited to the major combat operations (MCO) phase of OIF, and its implications for transformation. We thus restrict our attention to the outcomes of the fighting that began on the night of March 19-20, and that continued through the collapse of the regime, defined by the fall of Saddam's statue in Baghdad on April 9. We do not systematically or directly assess reconstruction, counterinsurgency, or nation building efforts in Iraq.

Saddam's ouster – and the implications posed thereby for transformation and American defense planning.

## II. The Course of Operation IRAQI FREEDOM

The campaign in Iraq began on the night of March 19-20 with an attempt to decapitate the Iraqi regime by bombing locations where Saddam Hussein was believed to be meeting with senior lieutenants. These air strikes failed to eliminate the Iraqi leadership or induce concession, however, and a joint air-ground invasion of Iraq was launched on the night of March 20-21.<sup>10</sup>

This invasion was conducted on several fronts. In the north, American special operations forces (SOF) teamed with air strikes and Kurdish allies on the ground in an economy of force action designed to hold Iraqi forces in place on the "Green Line" dividing the Kurdish autonomous zone from Iraq proper. In the west, SOF and supporting American conventional forces secured potential Scud missile launching sites and searched for Iraqi WMD.

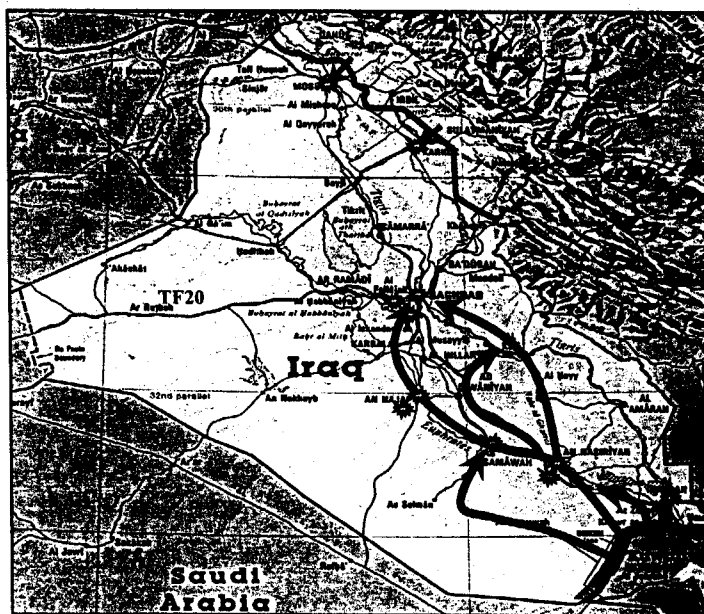


Figure 1.

The main effort was in the south, however, where American and British conventional forces invaded Iraq from bases in Kuwait along three primary axes. On the far right, the British 1<sup>st</sup> Armoured Division cleared the Faw peninsula and advanced on Basra. To their left, the U.S. 1<sup>st</sup> Marine Expeditionary Force (I MEF) secured the Rumaila oil fields, then moved north toward Baghdad. On the far left was the U.S. Army V Corps, led by the 3<sup>rd</sup> Infantry Division (3ID). As these forces advanced, Coalition air forces struck Iraqi air defenses, command facilities, WMD-capable fire support, and combat maneuver units in depth.

Iraqi forces were disposed with a combination of Regular Army and paramilitary forces defending the major approach routes in the south. Behind them, a ring of higher-

<sup>10</sup> For overviews of events, see, e.g., MG Blount, 3 ID (M) Command Brief, Operation Iraqi Freedom; CFACC/CAOC/NALE, "Operation Iraqi Freedom" briefing slides, n.d.; Anthony Cordesman, *The Iraq War: A Working Chronology* (Washington, DC: CSIS, April 2003).

quality Republican Guard divisions defended a "Red Line" of positions around Baghdad. Within the city itself, a combination of paramilitaries and Special Republican Guards defended prepared positions along key roads and intersections. To the north, a mix of Regular Army and reinforcing Republican Guard divisions defended the Green Line opposite the Kurds.

The initial advance from Kuwait moved quickly. In the process, many Iraqi units simply melted away, abandoning their arms and disappearing into Iraqi society in civilian clothes. Iraqi defenders of the southern cities of Nasiriyah, Najaf, and Samawah, however, mounted unexpectedly heavy resistance. Sharp battles at these critical river crossing sites cost the Iraqis heavy casualties while delaying the Coalition advance only slightly.

That advance soon stretched Coalition logistics to their limit. After covering over 350 kilometers in just four days, the pace slowed as a severe sandstorm hit central Iraq, reducing visibility to as little as a few meters in places and greatly complicating ground operations. As the sandstorm began, V Corps and I MEF had approached the Red Line but had not yet made sustained contact with the Republican Guard; as the weather slowed ground operations (and facilitated resupply), Coalition air forces hammered the Guard in its positions around Baghdad.

When the ground advance finally struck the Republican Guard, beginning on March 31, it overran the remaining resistance in battles at Objectives PEACH, MURRAY, and MONTGOMERY, completing the investment of Baghdad on April 7. In the meantime, an initial probe into the Baghdad metropolitan area proper was conducted by the 2<sup>nd</sup> Brigade Combat Team (2 BCT) of the 3<sup>rd</sup> Infantry Division; this "Thunder Run" consisted of a mounted raid into the city along Highway 8, then back out to a destination at the Saddam International Airport. Two days later, a second "Thunder Run" drove straight into the city center, reaching and then holding positions on the Tigris River bend. Subsequent advances into Baghdad from the north and east led to the rapid collapse of the city's defenses. By April 9 when the statue of Saddam in the city center was pulled down, Ba'athist rule had effectively ended; though President Bush did not announce the end of "major combat operations" until May 1, for all intents and purposes the initial goal of toppling the Ba'athist regime had been accomplished by April 9, after just 21 days of combat operations.

### III. Analysis: Speed, Precision, and Situation Awareness

How was this outcome induced at such low cost? Perhaps the most-cited reasons are the Coalition's speed, precision, and situation awareness.<sup>11</sup> Certainly the Coalition moved very rapidly, its weapons were very precise, and its knowledge of the battlefield was unprecedented. These were important advantages. Faced with such capabilities, Saddam's military had no hope of destroying the Coalition's forces on the battlefield. And such capabilities clearly contributed to lower Coalition casualties and made it harder, other things being equal, for Saddam to implement any plans for scorched earth or WMD use. Few would prefer a military unable to move quickly, strike precisely, or see the battlefield as clearly as possible - all are valuable capabilities for the future, as well as important contributors to reduced costs in 2003.

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<sup>11</sup> See references in note 5 above. Another oft-cited and related factor, jointness, is discussed in section VI below.

But merely to say these things helped is to leave the most important questions unanswered. Many things helped – the key is to understand how much. *How* valuable are speed, precision, and situation awareness, and *how much* did they contribute to the low cost of Saddam’s ouster? Implicitly, transformation advocates attribute great causal influence to such factors – to single them out is to suggest special significance. And in a world of tradeoffs and opportunity costs, magnitudes and relative importance matter centrally. Transformation proposals that make sense if speed, precision, and situation awareness were sufficient for the 2003 outcome may pose unacceptable opportunity costs against close-combat mass or other traits if the influence of speed, precision and situation awareness was less complete or more conditional.

And the evidence suggests that their causal influence, though important, was both incomplete and importantly conditional. Speed, precision, and situation awareness may well suffice in themselves to explain victory *per se*, but not its radically low cost. To explain 2003’s low casualties via speed, precision, and situation awareness is to imply that these capabilities left the Iraqis too maldeployed, too demoralized, or too weakened by standoff strike to have caused heavy casualties in tactical engagements.<sup>12</sup> Many Iraqis *were* caught out of position, demoralized, or destroyed at standoff ranges – but many others were not. There was significant close combat in OIF, under conditions that would normally be expected to have caused heavy Coalition casualties. Yet few casualties were suffered. Though they surely could not have destroyed the Coalition military or preserved Saddam’s regime, the Iraqi military nevertheless positioned enough willing, surviving combatants in close contact with Coalition ground forces to have caused much higher losses in spite of the Coalition’s speed, precision, or situation awareness. The magnitude of close combat against surviving, actively resisting Iraqis on favorable ground thus poses an important empirical challenge to this explanation of the outcome’s low cost.

Nor can speed, precision and situation awareness explain the failure of Iraqi scorched earth or the absence of Iraqi WMD use. At the margin, Coalition capability would surely have made scorched earth or WMD use harder for Saddam. But his failure to make good these threats was more Iraq’s doing than ours. The Iraqis systematically failed to prepare their infrastructure for destruction on more than a token scale. Even where Iraq held oilfields or other assets for weeks after hostilities began, they still failed to prepare them for destruction; it is hard to see speed or situation awareness as the reason they sat on key assets for weeks of actual ground warfare without following through on their prewar threats. If Iraq’s infrastructure had been properly prepared for destruction, it is far from clear that the Coalition’s speed, precision, or battlespace knowledge would have sufficed to preserve it. And Iraqi WMD, if they existed, were not close enough to launch status for

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<sup>12</sup> Tactical phenomena can have strategic consequences, and tactical level evidence can speak to central strategic questions. In fact, any claim for strategic-level causal relations must have observable referents that extend down to the tactical level: it is at the tactical level where fire is exchanged, casualties suffered, and ground taken, hence for strategic- or operational-level factors to affect the real war, they must ultimately be reflected somehow, somewhere, in tactical actions that destroy targets, take ground, or threaten to do so. For a strategic claim to hold, its logical implications for tactical events must also hold; for a strategic argument to imply tactical events that did not occur (or to preclude tactical events which *did* occur) is thus to invalidate the strategic argument, even if the observations used in the test were entirely tactical. Any part of the overall causal chain interconnecting strategic and tactical claims can thus be tested and the results can, in principle, speak to the validity of the chain overall as long as the deductive logic interrelating the claims at each level is sound. Strategic claims thus need not necessarily be tested at the strategic level. This is inherent in process tracing as a methodology, which is designed to enable theories to be tested by observing any part of the causal chain for which evidence is most available. In particular, for the analysis of speed, precision and situation awareness below, much of the

Coalition speed to have made much difference in their non-use.

Though surely helpful, speed, precision, and situation awareness were thus far from sufficient to explain the low cost of Saddam's ouster. To see why, we will consider first the role of close combat in OIF, and then the problems of scorched earth and WMD use.

### Close Combat in OIF

To explain the radically low cost of Saddam's ouster via speed, precision, and situation awareness is to imply, *inter alia*, that these factors left the Iraqis unable to cause significant casualties. In principle, this could have happened in several ways.

The Iraqis could, for example, have been demoralized by the speed and power of the Coalition advance, averting bloody urban warfare by leaving urban defenders unwilling to risk their lives. Shorter advances at slower tempos have taken the starch out of other defending armies in earlier wars; perhaps the reason there were not heavier losses in urban fighting was that the defenders of Baghdad, Basra, Nasiriyah, Samawah, and Najaf were demoralized by the sheer speed of the Coalition's advance or the precision of its deep attacks.<sup>13</sup>

Alternatively, the Iraqis could have been too outmaneuvered or disoriented to get sufficient forces to the right places at the right times to have caused higher casualties – or their command system could have been so disrupted by our speed and precision as to leave them unable to coordinate effective fires once in position. Our speed created a very challenging C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) problem for Iraq. The situation on the ground changed rapidly as Coalition columns sped forward; at the same time, Iraqi C4ISR was disrupted by deep strikes on headquarters and communication nodes, by jamming, and by fear of Coalition eavesdropping. For Iraqi commanders, survival required frequent, furtive movement; dispersal of command centers into small, covert entities; and constant attention to self-protection and concealment. This greatly complicated their ability to process whatever information they had, or to plan an effective response. By contrast, American C4ISR was robust and diverse, our information systems processed huge volumes of data, and our command nodes were largely unhindered by Iraqi attack.<sup>14</sup> This combination of Coalition speed, poor Iraqi C4ISR, and robust Coalition situation awareness suggests a boxing match between a blind and a sighted prizefighter: if the sighted could strike unseen while the blind could only flail in the darkness, then perhaps the sighted could land a knockout punch without receiving a blow in return. In a military context, this would explain low-cost victory via maneuver: our speed and ability to see without being seen could in principle have precluded heavy casualties by leaving the

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evidence adduced is at the tactical level, but this does not therefore exclude operational or strategic level conclusions given sound deductive logic on the interrelationships involved.

<sup>13</sup> This argument is implied, for example, in the views reported in Sonni Efron, "Pentagon Officials Defend Iraq Battle Strategy," *Los Angeles Times*, May 23, 2003; and Esther Schrader, "Official Ties Iraq's Troubles to U.S. Success," *Los Angeles Times*, July 9, 2003.

<sup>14</sup> Of course, there were exceptions. Third Infantry Division's 2<sup>nd</sup> Brigade Combat Team TOC (Tactical Operations Center) was hit by an Iraqi Abbeville 200 SSM (Surface-to-surface missile) during its advance into Baghdad, destroying some 22 vehicles, wounding 17 soldiers and killing another five. Yet the TOC kept going and the Brigade's advance was hardly hindered. There was also widespread frustration with the ability of the Army's MSE (Multiple Subscriber Equipment) communications system to keep up with the rapid pace of the V Corps advance into Iraq. MHI: Tape 050203p1sb COL Perkins, et al; Tape 050103p1sb LTC Gillette. Especially by comparison with Iraqi experience, however, Coalition command posts were largely unhindered, and Coalition information and communications systems were much more capable.

Iraqis too maldeployed or ill-coordinated to hurt us.

Either causal logic, however, implies that Coalition losses were averted by avoiding massed Iraqi fires in close combat – by reducing the amount of close-quarters fighting against willing combatants on favorable ground to the point where these could not inflict heavy casualties. Yet there was significant close combat in OIF against Iraqi fighters on urban terrain who proved willing to take extraordinary risks to kill Americans and Britons and who projected heavy volumes of fire in the process. Certainly there was far too much close combat to accept explanations that turn on its ostensible infrequency.

The key here is urban warfare. Urban terrain is ordinarily thought highly defense-favorable; defenders in cities should be able to fight at a considerable tactical advantage. The basis for most prewar fears of heavy Coalition casualties in conventional combat was concern with urban warfare. And in fact there was substantial close combat in Iraqi cities in OIF.

In Baghdad, for example, when 3ID's 2<sup>nd</sup> Brigade launched its "Thunder Run" into the city on April 5, it met a fusillade of Iraqi rocket propelled grenade (RPG) and small arms fire, at effectively point blank range, along nearly its entire route. *Every single vehicle* in the brigade column was hit at least once by Iraqi RPGs, and many took multiple hits. Two days later on April 7 when the brigade advanced from the city outskirts to the Tigris it again took heavy fire from all directions. Opposition was especially intense at highway overpasses and key intersections; Iraqi positions in these locations were destroyed but subsequently re-occupied by fighters who infiltrated back behind the moving American columns. An emergency resupply convoy sent forward from the airport after nightfall had to fight its way through to the brigade perimeter on the Tigris; it lost one ammunition and two fuel trucks in a wild ride through a series of desperate fire fights, suffering two soldiers killed and 30 wounded en route. The next morning, the brigade was counterattacked by waves of paramilitaries hanging over the sides of some 50-100 civilian vehicles and firing small arms and RPGs as they poured over the Tigris River bridges toward the brigade perimeter.<sup>15</sup> When 3<sup>rd</sup> Brigade entered Baghdad from the north it, too, fought its way through volleys of massed RPGs fired from practically point blank range; every armored vehicle in 3<sup>rd</sup> Brigade suffered either a hit or a near miss from RPGs while fighting their way into the city.<sup>16</sup>

Similarly, in Nasiriyah Iraqi paramilitaries and elements of the 11<sup>th</sup> Regular Army division waged a week-long urban battle against the Marine Corps' Task Force Tarawa, a reinforced three-battalion regimental-scale formation. In Samawah, Iraqi paramilitaries fought for a week against the Army's 3-7 Cavalry, the 3<sup>rd</sup> Brigade of the 3<sup>rd</sup> Infantry Division, and the 2<sup>nd</sup> Brigade of the 82<sup>nd</sup> Airborne Division in turn. In Najaf, urban warfare in and around the city center continued for more than a week, tying down in series multiple brigades of American infantry.<sup>17</sup>

The exact strength of the willing, surviving Iraqi opposition in these and other urban battles cannot be known, but it was clearly enough to produce a major volume of potentially lethal fires at very close quarters. Perhaps 30,000 Iraqi paramilitaries were

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<sup>15</sup> MHI: Tape 050203p1sb COL Perkins, et al. int.; Tape 050103p2sb MAJ Walter int.; Tape 050203a1io and Tape 050203a2sb, LTC Bayer, et al. int.

<sup>16</sup> MHI: Tape 050303a1sb COL Allyn, et al. int. Some British Challenger tanks took 7 to 9 RPG hits during their own "Thunder Runs" in Basra: Tape 050803a2sb MAJ Longman, et al. int.

<sup>17</sup> See, e.g., MHI: Tape 042903p2sb LTC Kerl, et al. int.; Tape 043003p2io COL Johnson int.; Tape 050103p2sb MAJ Walter int.; Tape 050303p2sb LTC Ferrell, et al. int.; Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050203p1sb COL Perkins, et al. int.

predeployed in Baghdad, Basra, Najaf and Nasiriyah before the war began. Another 15,000 Special Republican Guards (SRG) were predeployed in Baghdad and its suburbs. Some 10,000 paramilitary reinforcements were moved south from Baghdad into Nasiriyah and Najaf after it became clear that major battles were underway there for control of the bridges running through these cities.<sup>18</sup> SRG infantry and paramilitaries in mostly civilian clothing were poor targets for Coalition deep strikes, which were aimed chiefly at Iraqi leadership, command, air defense, and heavy weapons targets. While paramilitary losses were heavy in close combat with Coalition forces, there is little evidence to suggest that they suffered much attrition prior to contact with invaders on the ground. And combat motivation, while very weak in Iraqi Regular Army and some Republican Guard units,<sup>19</sup> was stronger elsewhere – and especially among paramilitary fighters in Iraqi cities. In fact, paramilitary combat motivation bordered on the suicidal in 2003. In Nasiriyah, Samawah, Basra, Najaf, Baghdad, and elsewhere, Iraqi paramilitaries executed repeated frontal assaults against American armored vehicles using civilian sport utility vehicles, pickup trucks, minivans, and even bicycles. In Samawah, Iraqi SUVs rammed American armored vehicles. Even after initial waves of such kamikaze charges were mowed down, others followed. In Baghdad, Iraqi reinforcements reoccupied devastated positions to resume resistance after American columns drove on. Iraqi defenders of Nasiriyah and Samawah kept fighting long after being bypassed by American spearheads. Basra's garrison held out through a two-week siege until defeated by a British variant on the Baghdad "Thunder Runs": multiple British armored columns drove into the urban center and broke the resistance by direct fire. This is inconsistent with a model that Iraqi forces were too maldeployed, or too demoralized by Coalition speed or precision to offer meaningful resistance.<sup>20</sup>

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<sup>18</sup> MHI: Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 042903p1sb COL Brown, et al. int.; Tape 050303a1sb COL Allyn, et al. int. In Baghdad, an estimated 1,000-2,000 paramilitaries were killed in 2<sup>nd</sup> Brigade's two "Thunder Runs" alone: Tape 050103p2sb MAJ Walter int.; Tape 050203a1io LTC Bayer, et al. int.

<sup>19</sup> Note, however, that Coalition speed was not necessarily responsible for this: most of the Iraqi Regular Army had little will to fight even before the war began, much less after they observed our rate of advance. Many units, for example, had made elaborate plans for escape or surrender before the ground war even started: in the 18<sup>th</sup> Brigade, Company Commanders were instructed by their superiors as soon as the bombing began to release their units and leave the battlefield, whereupon their Battalion Commander fled (MHI: Tape 042403a2sb MAJ al Tamimi int.). In the 11<sup>th</sup> Division, the Commander of 3<sup>rd</sup> Battalion, 45<sup>th</sup> Brigade had presented surrender plans to his Company Commanders even before the air war had begun (Tape 042303a2sb St. COL al Saadi int.). Desertion rates were high long before units had been contacted or bypassed by Coalition ground forces: of 520 prewar soldiers in 3<sup>rd</sup> Battalion, 45<sup>th</sup> Brigade, 11<sup>th</sup> Infantry Division, 90 deserted before the air war began, and all but 150 had left by the time the commander surrendered; more than half the initial troop strength of the 51<sup>st</sup> Division's 32<sup>nd</sup> Mechanized Brigade had deserted before March 21; 30-40 percent of the 700-1000 prewar soldiers in II Corps' 3<sup>rd</sup> Mechanized Brigade had deserted by March 23, when the Brigade's commanding officer followed suit; 280 of 400 soldiers in a brigade defending near Najaf had deserted prior to contact; of the 94 troops initially manning the Al Hadr stores and equipment depot, only 17 were left by April 6 when its commander went home (Tape 042303a2sb St. COL al Saadi int.; Tape 042503a1sb LTC al Hasnawi int.; Tape 042403p1sb LTC al Araghi int.; Tape 042503a1sb COL al Sanabi int.; Tape 042503a1 COL Delfi int.). Although Ba'athist paramilitaries often killed Regular Army soldiers found with non-military clothing, many nevertheless wore civilian clothes under their uniforms to facilitate desertion (Memorandum for the record, LTC Rodgers, LTC Marcoz int., 22 April 2003, CFLCC HQ, Camp Doha Kuwait). Captured Iraqi officers report widespread prewar defeatism, disaffection with the Ba'athist regime, and limited combat motivation across a wide range of Regular Army combat and support units (Tape 042303p0sb, LTC Kadhim int.; Tape 042403a1sb LTC Hamid int.; Tape 042403a2sb MAJ al Tamimi int.; Tape 042303a2sb St. COL al Saadi int.; Tape 042403p1sb LTC al Araghi int.; 042503a1sb COL al Sanabi int.; Tape 042503a1 COL Delfi int.; Tape 042503a1sb LTC al Hasnawi int.). None of this required, or was caused by, the speed of a Coalition advance that came well after morale had already broken in such units.

<sup>20</sup> MHI: Tape 050203p1sb LTC Schwartz, et al. int.; Tape 050303a1sb COL Allyn, et al. int.; Tape 050303p1sb, LTC Pease int.; Tape 050303p1io MAJ Walter, et al. int.; Tape 050303p2sb LTC Ferrell, et al. int.;



Of course, none of this is to suggest that Iraqi paramilitaries or SRG infantry were a serious threat to halt the Coalition advance; even at full strength, neither had much chance of holding Iraq's cities against a determined assault. The "Thunder Runs" in Baghdad and Basra do appear to have broken the defenders' morale once it became clear to them that their best efforts were proving futile. And speed, precision, and situation awareness did leave much of the Iraqi military out of position, unwilling to fight, or destroyed by deep strikes.<sup>21</sup>

But what was left - what the Iraqis did manage to get into close combat with Coalition

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Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050103p2sb MAJ Robert Walter int.; Tape 050203p1sb COL Perkins, et al. int.; Tape 050803a1sb MAJ Maciejewski int.; Tape 050803a2sb MAJ Longman, et al. int.; Tape 050803a2sb CPT Ryan int. On the contrary, there is some evidence to suggest that Coalition speed may at times have inadvertently increased, not decreased, Iraqi will to fight. Other things being equal, higher operating tempo affords less time for detailed movement planning and rehearsals, and tends to strain resupply capacity, tiring drivers and convoy commanders. The rapid pace of the Coalition advance may thus have contributed to the navigational errors which resulted in the U.S. 507<sup>th</sup> Maintenance Company's ambush by Iraqi forces in Nasiriyah on March 23. There are indications that this American tactical setback may have encouraged members of the Iraqi Regular Army's 11<sup>th</sup> Division assigned to the defense of the city to reverse plans for desertion and instead stand fast and fight back: see, e.g., MHI: Tape 042403p1sb LTC al Araghi int.; Tape 050203a2sb LTC Bayer int.; Tape 050303a1sb COL Allyn, et al. int. Several of the Marine officers who subsequently fought in Nasiriyah now believe this was the case: see, e.g., 042903p1sb COL Brown, et al. int.; 043003p2io COL Johnson int. If the 11<sup>th</sup> Division was in fact ready to quit the field when its resolve was instead stiffened by an apparent victory over the Americans in the 507<sup>th</sup>, then the speed that contributed to the ambush may have had the opposite of the hypothesized effects on Iraqi combat motivation at Nasiriyah. (Note that when the 507<sup>th</sup> was ambushed, the front had already moved well beyond Nasiriyah to the north and northeast.)

<sup>21</sup> While the discussion above focuses on Iraqi paramilitaries and SRG infantry, it is interesting to note that the Iraqis also managed to redeploy elements of four Republican Guard divisions - the Hammurabi, Adnan, Nebuchadnezzar, and Medina - across the Coalition axis of advance after the conflict began (MHI: Tape 050403p1io LTC Sterling int.; Memorandum for the record, MG Blount, et al. int., 4 May 2003, 3<sup>rd</sup> Infantry Division HQ, Baghdad International Airport, Iraq; Memorandum for the record, LTC Rodgers, LTC Marcoz int., 22 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 062503a1sb LTC B int; 050203p1sb COL Perkins, et al. int.). Not all of Iraq's heavy forces were thus maldeployed. It is important to keep these movements in perspective. At its best, Iraq's response was incomplete and ill-coordinated. Yet the resulting mixture of error, accident, and insight nonetheless produced a significant movement of Iraqi combat power into positions from which it could, in principle, have inflicted serious losses on Coalition forces. How did the Iraqis do this? The answer probably lies in a combination of several factors. First, even a purely random movement of tens of thousands of combatants will place some in advantageous combat positions. In fact, however, the Iraqis' movements were not purely random. Hence part of the answer presumably lies in their ability to extract some, albeit limited, knowledge from primitive sources. For example, geography reduced the number of possibilities. American television commentators did a fair job of anticipating the likely concept of operations from nothing more than map analysis and background knowledge of military affairs; it is not inconceivable that the Iraqis' own appreciation of the possibilities - even without ISR data per se - would have gotten them into the right ballpark. Moreover, OIF involved an American advance into hostile country. Our forces were thus moving through a natural sensor net in the form of many thousands of Iraqi observers who could see our movements and report on their observations. Most of Iraq's paramilitaries and intelligence operatives wore civilian clothes and could not easily be distinguished from innocent noncombatants. This enabled Iraqi observers to conduct detailed reconnaissance simply by walking up to American forces in plain sight, quietly counting vehicles and noting locations, then walking back to homes or other concealed locations with the information (MHI: Tape 043003p2io COL Johnson int.; Tape 050303a1sb COL Allyn, et al. int.; Tape 043003a1io COL Toolan, et al. int.; Tape 050203a2sb LTC Bayer int.). There were simply too many pairs of eyes in a position to see what we were doing for our movements to have been covert in any meaningful sense. Finally, this contact information can be communicated by primitive means that are almost impossible to interdict. For example, couriers in civilian clothes can carry messages with little real danger of interception. High-performance military communications systems offer much faster throughput and much higher capacity; denying these to an enemy clearly reduces their message traffic. But traffic cannot be reduced to zero. An opponent who anticipates disruption and plans courier relays or mobile phone networks to get truly critical information through can ensure that a small volume of key messages reaches their destinations. The Iraqis made extensive use of just such work-arounds. The net result was some ability to collect direct contact intelligence on major American movements, and to report it to central authorities. Again, this is not to suggest that Iraq had perfect surveillance, or comprehensive real-time reporting on American whereabouts. But the Iraqi high command surely realized well before the war that it would need to operate covertly in order to survive, and that its communications means would be able to handle only



ground forces on favorable, urban terrain – was in principle more than enough to have caused much heavier Coalition casualties.<sup>22</sup> The “Thunder Runs” in Baghdad alone received a volume of fire that with historical loss rates might have been expected to have devastated at least two brigades of Coalition forces. Before the war, the Marines estimated that even with maximum proficiency, their own troops could expect no better than about a 1:1 loss exchange ratio in offensive urban warfare.<sup>23</sup> If the surviving, actively resisting components of the Iraqi paramilitary and Special Republican Guards in Iraq’s cities had comprised even ten percent of their prewar totals, an exchange ratio like this could easily have increased Coalition losses by a factor of ten or more. That this did not occur is thus hard to attribute to speed, precision, and situation awareness. While helpful, these capabilities did not in themselves preclude a volume of urban close combat that would normally be expected to yield much heavier casualties.

### Scorched Earth and WMD Use in OIF

Many now believe that speed prevented the Iraqis from destroying the Rumaila oil field, sabotaging the port facilities at Um Qasr, blowing the primary bridges over the Tigris and Euphrates, and flooding the Karbala Gap. And of course, it has been widely argued that Coalition speed preempted Iraqi use of WMD.<sup>24</sup>

Yet there is substantial evidence to suggest that Coalition speed was less important than Iraqi choices for these outcomes. With respect to scorched earth, for example, properly wired bridges, oil wells, pipelines, cranes, or levees can be blown in seconds from safe locations with the pressing of a single button. Secure landline cables connecting switchboxes with explosives would make such commands very difficult to interdict.

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small volumes of the most important information. It would not be implausible to suppose that they had prepared a system designed mainly to cue them on basic information about which of a restricted range of possible approach routes the Coalition was actually using, and to provide to key central decision makers (if not to tactical commanders in the field, several of whom were captured when inadvertently stumbling upon Coalition units) gross estimates of how far along those routes we had actually moved at any given time.

<sup>22</sup> Note that little formal C4ISR was needed for this. It was surely obvious to all that Baghdad would be the Coalition’s ultimate objective – forces predeployed there could be assured of a chance to kill Americans. And it was equally obvious that the cities controlling key Tigris and Euphrates bridges would be essential to any advance on Baghdad from the south; forces predeployed in these cities would likewise be sure to see important combat. The Iraqis apparently did manage to extract some ISR information on our movements (see note 21), but even without intrawar ISR, the fact that the Coalition’s key objectives would inevitably be cities made it easy for Iraq to ensure that there would be enough forces in position to threaten the Coalition with serious losses in urban combat. In fact, this will almost always be the case: regardless of the theater or its geography, cities will necessarily be important politico-military objectives, making it nearly impossible to preclude urban close combat via speed or maneuver alone.

<sup>23</sup> In a series of experiments at George Air Force Base, California, for example, Marine infantry units suffered some 100 casualties to defeat a force of 160 defenders in mock urban combat: Greg Jaffe, “Urban Warfare,” *Deseret News*, September 1, 2002, pp. AA02ff.; Scott Peterson, “Iraq Prepares for Urban Warfare,” *Christian Science Monitor*, October 4, 2002, pp. 1ff. Of course, much depends on the defenders’ skills; on variance in urban warfare casualty levels as a function of defender skill levels, see, e.g., Daryl G. Press, “How to Take Baghdad,” *New York Times*, March 26, 2003, p. A17.

<sup>24</sup> See, e.g., Donald Rumsfeld, Testimony before the Senate Appropriations Subcommittee on Defense, FDCH Transcripts, May 14, 2003, pp. 3; Paul Wolfowitz, Testimony on Iraq Reconstruction, Senate Foreign Relations Committee, Thursday May 22, 2003, pp. 2, 7; idem., Testimony on U.S. Military Presence in Iraq: Implications for Global Defense Posture, House Armed Services Committee, Wednesday June 18, 2003, pp. 4-6; Tom Bowman, “Rumsfeld Taunting but Naysayers Persist,” *Baltimore Sun*, May 18 2003; Sonni Efron, “Pentagon Officials Defend Iraq Battle Strategy,” *Los Angeles Times*, May 23, 2003; Esther Schrader, “Official Ties Iraq’s Troubles to U.S. Success,” *Los Angeles Times*, July 9, 2003; Max Boot, “The New American Way of War,” *Foreign Affairs*, Vol. 82, No. 4 (July/August 2003), pp. 41-58; Andrew Krepinevich, *Operation Iraqi Freedom: A First-Blush Assessment* (Washington, DC: Center for Strategic and Budgetary Assessments, 2003).

Predelegated detonation authority could have afforded local commanders the ability to beat invaders to the punch even if unable to communicate with Baghdad. Had the Iraqis taken such precautions, massive damage could have been done in seconds – long before even the fastest invasion could have reached them – and it was not in our power to prevent them from doing so if they had so chosen.

Of course, they did not. Far from it: in fact, the Iraqis did remarkably little to implement Saddam's threat of scorched earth. They neither prepared their infrastructure for destruction on more than a token scale, nor were they in the process of doing so, either before the war or during the fighting. On the contrary, some key facilities were left in their possession for weeks after the fighting actually began, yet were left undamaged and found unprepared for demolition when Coalition forces finally captured them. It is hard to see how the difference between a fast and a slower Coalition advance would have been decisive when even weeks of time could pass without the Iraqis implementing threats that could in principle have been realized in fractions of that time. They may never have intended to carry out the threat of scorched earth: the evidence is consistent with a hypothesis that this was merely a bluff for deterrent purposes. Or perhaps the Iraqi military's training or organization left them unable to do the job right. But either way, their lack of preparations left them unable to destroy infrastructure on any wholesale basis, and their failure to destroy even facilities left in their possession for weeks after the fighting began suggests that it was not our speed of advance that caused this. At the margin, speed may have made adequate preparation harder for the Iraqis, but it could not make it impossible, and it does not appear to have been the main reason why the threat was not carried out.

Consider, for example, the issue of oil field destruction. Of the more than 250 wells in the Rumaila oil field, only 22 had actually been prepared for demolition when the Marines secured the field on March 21. Of these 22, only 9 were actually detonated, causing just 7 fires. No gas-oil separation plants (GOSPs), pumping stations, or pipelines were wired for destruction. Nor was there evidence of ongoing efforts at preparing additional wells or other oil field facilities for destruction in the days before the invasion or the early stages of the invasion itself. Twenty-two wells had been prepared for demolition in advance of the war; the Iraqis then stopped and did not significantly expand their preparations either just before or during the war's initial stages. Even after the war began, and even with a very fast-moving offensive, there were still some 48 hours available to the Iraqis between the beginning of hostilities and the time the field was actually secured – they had considerable, but unused, time for setting charges or destroying additional facilities even after they knew the war was on.<sup>25</sup>

In fact, the Kirkuk oil field in the north remained in Iraqi hands for more than *three weeks* after the invasion began. Yet at no point in that interval were any oil wells destroyed, or any facilities demolished, or any fires set. No evidence of preparation for demolition was discovered when American troops finally took possession of the field after April 7; in fact, dirt had been piled around a number of wells to protect them from accidental destruction in the fighting.<sup>26</sup> Even if one were to argue that the Iraqis would

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<sup>25</sup> MHI: Memorandum for the record, CW4 Crowder (Oil Fusion Team Head, CFLCC JACE) int., 12 May 2003, CFLCC HQ, Camp Doha Kuwait; Memorandum for the record, MAJ Earnshaw int., 8 May 2003, 1<sup>st</sup> UK Armored Division HQ, Basra Iraq.

<sup>26</sup> MHI: Tape 062403p1sb LTC K int.; Tape 050103p2sb MAJ Robert Walter int.; Memorandum for the record, CW4 Crowder (Oil Fusion Team Head, CFLCC JACE) int., 12 May 2003, CFLCC HQ, Camp Doha Kuwait.

have demolished Rumaila if we had only given them more time, at Kirkuk they had the time – by any standard.<sup>27</sup> Yet they did less demolition at Kirkuk than at Rumaila.

There are a number of possible explanations for this. Former Iraqi Foreign Minister Tariq Aziz, for example, claims that Saddam expected a long air campaign before any ground invasion;<sup>28</sup> perhaps he had planned to wait until the middle of the air campaign to prepare the facilities for demolition, then torch them only as Coalition ground forces advanced. If so, then “speed” (in the sense of an accelerated timetable for invasion without waiting for a long bombing campaign) might still have prevented oil field destruction. Among the problems with this thesis, however, is Kirkuk.<sup>29</sup> Iraq held the Kirkuk oil field for literally weeks after it was obvious that a major ground offensive was under way – and for weeks after the Iraqis had already responded to their knowledge of the invasion by moving paramilitaries and major maneuver units onto key battlefields.<sup>30</sup> Yet they never destroyed the oil field. Is it plausible to suppose that after waiting through three weeks of actual ground invasion with no actual destruction they would then have torched the field if only a slower-paced advance had given them another week or two?

Alternatively, Iraqi civilian oil workers may have disabled preset charges by cutting wires, removing batteries, or dismantling explosives. Their livelihoods depended on the oil fields, after all, and few felt much loyalty to Saddam. Although they would have risked punishment at the hands of Ba’athist paramilitaries if they had been discovered disabling charges, it would not be far fetched to suppose that some may have preferred a risk of discovery by paramilitaries to a risk of unemployment after the war if they allowed Saddam to destroy the oil fields.<sup>31</sup> No evidence of such counter-demolition sabotage has been discovered, but the possibility cannot be ruled out. Either way, though, Coalition speed would have been largely irrelevant to the outcome, which would be attributable to Iraqi disobedience rather than Coalition speed.

Other possibilities include organizational incapacity or cowardice on the part of personnel assigned to oilfield destruction. The Iraqi military is hardly among the world’s most efficient; perhaps it simply failed to manage the job of setting charges properly or in quantity, and hence Saddam’s orders went unheeded due to incompetence as opposed to design or disloyalty. Ba’athist despotism discouraged individual initiative in the Iraqi officer corps; perhaps junior officers charged with demolition were left unable to communicate with higher command and refused to act on their own without orders. The location of the few destroyed wells also allows the possibility that isolated security personnel manning the more-exposed southern sections of the Rumaila field may have sensed Coalition activity just across the border, concluded that an invasion was imminent, and fled their positions in panic, reflexively torching the wells in the confusion

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<sup>27</sup> In 1991, Iraqi engineers wired Kuwaiti oil fields for destruction in about a month of work performed during the fighting itself: Memorandum for the record, CW4 Crowder (Oil Fusion Team Head, CFLCC JACE) int., 12 May 2003, CFLCC HQ, Camp Doha Kuwait.

<sup>28</sup> John Lumpkin, “Aziz: Saddam Misjudged U.S. Invasion,” *Associated Press*, November 3, 2003.

<sup>29</sup> There are other difficulties, too. Aziz’s credibility has been challenged by many: *ibid.* Perhaps more important, the pattern of Iraqi behavior at Rumaila, as well as Kirkuk, is difficult to square with this thesis. Why begin demolition preparations well in advance (by wiring 22 wells), but then stop? If Saddam expected to have weeks of preparation time after the air war began, then why start so soon? And if it was necessary for some reason to begin so early, then why stop so far short of finishing the job when there was still so much time available for completing the work?

<sup>30</sup> See note 21 above for details on Iraqi movements.

<sup>31</sup> In fact, many oil industry workers returned to work as early as March 23, while the fighting was still raging to the north – their livelihood was clearly important to them. MHI: Tape 050103p2sb MAJ Robert Walter int.; Memorandum for the record, CW4 Crowder (Oil Fusion Team Head, CFLCC JACE) int., 12 May 2003, CFLCC HQ, Camp Doha Kuwait.

of a hasty retreat. Here too, though, Coalition speed would have played little role - a slower advance would not have rendered Iraq's oilfield garrisons any more competent; and even if it somehow did, Kirkuk should have been destroyed. Yet it was not.

Another possibility is that the Iraqis never actually intended to destroy the oil fields, but used the threat as a bluff to deter the United States from attacking in the first place. Saddam surely hoped to avoid war as his best chance of emerging from the crisis alive. Deterrence is a standard tool for war avoidance in such conditions. To be successful, deterrence must threaten assets of value to the enemy, and the threat must be seen as credible by the target. A threat of oilfield destruction made credible by torching a few wells as a demonstration would have fit these criteria well. American fears of Iraqi scorched-earth tactics had been a major theme in the Western press in the months leading up to the war, and Mideast oil is obviously important to the American economy; it would not have been hard for Saddam to conclude that we cared deeply about Iraqi oil fields, making a threat to destroy them a natural deterrent possibility. A standard means of establishing credibility for a threat is to execute a small part of it, showing the resolve to carry out the rest if necessary. What better way to convince Americans that their fears of scorched earth were justified than to torch a few wells? It is interesting to note that the wells actually torched in Rumaila were on the very southern edge of the field: all 22 of the wired wells were within 3 kilometers (i.e., within visual range) of the Kuwaiti border - fully half were within 500 meters of Kuwait. The nine wells detonated were among the 13 southernmost wells in the entire field. The actual destruction thus occurred in a place where observation from the Coalition side of the border was unavoidable. (Kirkuk, by contrast, where no actual destruction was undertaken, is much more remote from the prewar border.) It is also interesting to note that wellhead demolition is not the most efficient method for wholesale destruction of an oil field: GOSPs are many fewer in number, highly vulnerable, and thus a critical node for production. If one wanted to maximize damage with minimum effort and preparation time, destruction of GOSPs or connecting pipelines would have been far more efficient than wholesale demolition of individual wellheads. Yet none of these efficient targets were struck at all. On the contrary, visible repairs to pipelines and other infrastructure in Rumaila were underway right up to the start of the campaign itself, as were ongoing efforts to expand the field's production to the west: why repair or expand facilities one is about to destroy?<sup>32</sup> At least one possibility is that the threat was a bluff: they wanted us to think that war would leave the industry in ruins, but never intended to do more than token damage themselves.<sup>33</sup>

Either way, though, none of these possibilities are consistent with a claim that only a fast-moving advance prevented mass destruction of the Iraqi oil industry. Whether its preservation is attributable to disloyalty by oil workers, deterrent design, organizational incompetence, panicked individuals, or expectation of a longer air campaign, none implies a process which would have yielded significantly wider destruction if the campaign had lasted weeks or even months longer than it did. If time were all the Iraqis needed, then at

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<sup>32</sup> MHI: Memorandum for the record, CW4 Crowder (Oil Fusion Team Head, CFLCC JACE) int., 12 May 2003, CFLCC HQ, Camp Doha Kuwait.

<sup>33</sup> Of course, if this were so then the deterrent threat helped cause what it meant to prevent: the timing of the invasion, at least, was driven by American fears that scorched earth was imminent once we observed the initial fires in Rumaila. Given this, we accelerated the invasion timetable in an attempt to preclude further destruction. This is a standard risk of deterrent strategies, however. Critics of deterrence policies have long argued that the threats on which deterrence turns can induce the attacks they are meant to deter. See, e.g., Richard Ned Lebow, "Deterrence: A Political and Psychological Critique," in Paul C. Stern, et al., eds., *Perspectives on Deterrence* (New York: Oxford Univ. Press, 1989), pp. 25-51.

a minimum, Kirkuk should have been razed. Yet it was not.

Iraqi bridges, port facilities, and dikes follow a similar pattern. The Coalition advance was obviously premised on its ability to use a series of key bridges over the Euphrates River. The towns at these crossings were in fact major battlefields in the war, as the Iraqis apparently understood their importance and sought to contest the bridge sites. Yet few of these bridges were wired for demolition, and even fewer were actually destroyed. At Nasiriyah, the Iraqis fought a week-long battle for a city whose military importance turned on its bridges – yet the Iraqis made no systematic effort to destroy them.<sup>34</sup> Of the five bridges surrounding Basra, only one was wired, and none were actually destroyed.<sup>35</sup> At Objective PEACH south of Baghdad, the key bridge was found wired for demolition, but undestroyed.<sup>36</sup> The key port of Um Qasr, critical to the potential prosperity of postwar Iraq, was undamaged in the war and captured intact by Coalition forces, even though the Iraqis held the port and its facilities for two days of fighting prior to its capture and could have done extensive damage had they used this time to do so.<sup>37</sup> American commanders had worried that the Iraqis would flood the Karbala Gap, a key choke point on the road to Baghdad and a potentially promising target for Iraqi WMD use against stalled Coalition ground forces. Yet nothing of the kind happened – the closest the Iraqis came to deliberate flooding was some small-scale tactical inundation in the Subiyat Depression near Nasiriyah.<sup>38</sup>

What about Iraqi WMD? Did speed preempt its use? As of this writing, no WMD have been found anywhere in Iraq. It is thus quite possible that none existed at the time of the campaign. If none existed, then Coalition speed was obviously irrelevant to explaining its nonuse.

It is also possible that WMD will eventually be found. The difficulty of locating them, however, suggests that it would probably have taken considerable time to make these weapons ready for use during the campaign. At a minimum, no WMD have been found in any reasonable proximity to an intact delivery system, or near any form of transportation that could move them to a delivery system with any dispatch. If WMD exist in Iraq, they exist in deep cover – and possibly buried and/or disassembled. If so, then it is hard to see how a slower Coalition advance would have enabled these to have been recovered, reconstituted, and employed without being detected and either destroyed from the air or overrun by even a much slower ground force advance in the meantime. Without direct evidence of their status it is difficult to reach authoritative conclusions, but at a minimum there is no current evidence to suggest that the Iraqis had WMD close enough to employment for the speed of the Coalition advance to have made any difference in their use. Conversely, it is at least consistent with the available evidence to hypothesize that the Iraqis could not have used WMD soon enough to head off overrun by even a much slower-moving Coalition advance.

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<sup>34</sup> For example, by targeting them for artillery or mortar fire after losing them to American control, let alone by effective pre-capture demolition. MHI: Tape 042903p2sb LTC Kerl, et al. int.; Tape 043003p2io COL Johnson int.

<sup>35</sup> MHI: Tape 050803a2sb MAJ Longman, et al. int.

<sup>36</sup> One span was dropped, but the bridge remained trafficable. MHI: Tape 050203a1io LTC Bayer, et al. int.; Tape 050103p2sb MAJ Robert Walter int. On the survival of most Iraqi bridges, see Memorandum for the record, MAJ Stephenson int., 30 April 2003, I MEF HQ, Hillah, Iraq.

<sup>37</sup> The authors inspected the port facilities on April 25, 2003, and found no apparent evidence of damage. Captured Iraqi officers maintain that orders to destroy the port would not have been followed – the commanders at the scene viewed the facilities as the patrimony of the Iraqi people and not as tools for defending Saddam: MHI: Tape 042403a1sb LTC Hamid int.

<sup>38</sup> MHI: Tape 042803p1sb MG Marks, COL Rotkoff int.

#### IV. Analysis: Luck and Force Size

The combination of speed, precision and situation awareness is not the only possible explanation of the low cost of Saddam's ouster. Some, for example, emphasize luck. The forces committed to OIF were smaller than many planners had advocated before the campaign.<sup>39</sup> Many believe these forces were too small, and that the plan accepted inappropriate risks in order to reduce American troop commitments. Some of these risks relate to troop adequacy for postwar stabilization and reconstruction. Initially, however, the main argument pertained to the warfighting itself: such a small force left us very close to the margin of safety for low cost victory, it was argued. This in turn implies that luck was causally central in 2003 - had the breaks gone differently we would have incurred far heavier costs.<sup>40</sup>

To assess this claim requires looking at breaks that might plausibly have gone differently: how big a break would the Iraqis have needed to hurt us much more badly? And if this happened, would a larger Coalition force have made any difference? The argument on risk and force size, after all, is implicitly a claim that a small force was vulnerable to bad breaks that a larger force would not have been.

In this context it is useful to distinguish three categories of bad breaks: (1) unfavorable random events given the same Iraqi choices and military instruments; (2) better Iraqi choices with the same instruments; and (3) better instruments. War is probabilistic, hence even if nothing else changes, outcomes will still vary with the luck of the draw. If a few chance misfortunes of weather or mechanical failure or coincidence would have overwhelmed the small force of 2003 but not a larger one, then we were clearly lucky in 2003; the fewer or smaller the misfortunes needed, the luckier we were and the greater the risk we accepted with such a small force. Alternatively, chance could have created better Iraqi choices in addition to inanimate misfortunes of weather or mechanical breakdown. Under the stress, fog, and fatigue of war, commanders sometimes spot opportunities, but sometimes they miss them; in two random trials, the same commander might make different choices under the same conditions. Of course, unfeasible or implausible choices can be ignored, but if the Iraqis had feasible, plausible options which they overlooked in 2003, and which could have hurt a small force badly but not a larger one, then their failure to seize the opportunity might be attributable to luck. And if so, then we accepted a greater risk in committing such a small force than if we had sent more troops. Finally, the Iraqis could, in principle, have had different instruments: better equipment, better trained troops, better motivated people. One could view their failure to train better, motivate better, or field better weapons as a stroke of good luck for us. And there is important truth in this. But whereas chance clearly plays a major role in random misfortune, and whereas chance could have caused some commanders to overlook opportunities in the clinch, it is much less clear that the Iraqis' training, motivation, or equipment were products of random accident or happenstance. The nature of the Iraqi military is more likely a product of structural features of Iraqi society and politics, rather than the chance product of a random draw; if a second random trial could somehow be run, it seems likely that an Iraq under Saddam would still produce a military trained, equipped, and motivated much like 2003's. We thus focus here on the first two kinds of breaks: different

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<sup>39</sup> On CENTCOM and CFLCC planning and the associated force requirements, see, e.g., MHI: Tape 042703a1sb LTC Reilly int.; Tape 042803p2sb LTC Reilly int. continued.

<sup>40</sup> See, e.g., Tom Bowman, "Rumsfeld Taunting but Naysayers Persist," *Baltimore Sun*, May 18, 2003.

random draws with the same Iraqi choices and instruments, and different choices with the same instruments. We address the role of variation in the instruments themselves in the discussion of "skill-technology synergy" below.

To conclude that luck was causally critical thus requires a finding that *these Iraqis* - with their troops, training, equipment, and government - could have hurt us badly by choosing differently within a set of realistic options, or that pure random chance could have reversed the outcome with or without a difference in either side's choices. By these criteria, however, it is hard to see luck *per se* as causally central. And where it was most important, it is hard to see how larger Coalition forces could have reduced its role much.<sup>41</sup>

Weather, for example, is among the more prominent contributors to inanimate random variation in war. Bad luck could surely have produced worse weather, and this would surely have complicated operations. Yet OIF as actually fought already involved some very difficult weather - without undermining the Coalition war effort. In particular, the sandstorm that hit Iraq on March 25 and lasted until March 27 was extraordinarily harsh. It reduced visibility to as little as five feet through even thermal sights, destroyed tents and other light or unsecured equipment, and grounded helicopters.<sup>42</sup> The storm significantly slowed the ground advance: with visibility so limited, the risk of casualties from friendly fire grew and made major combat maneuver in the face of the enemy much riskier. Yet combat operations continued. Coalition air forces flying all-weather fixed-wing aircraft continued to pound the Republican Guard and other Iraqi targets across the theater. In fact, much of the attrition inflicted on the Guard from the air occurred during the sandstorm.<sup>43</sup> Moreover, resupply movement continued; the sandstorm actually improved the Coalition logistical situation, as it slowed the fast-moving spearheads enough to allow resupply convoys to reach them and replenish food and ammunition that had dwindled during the long, rapid advance.<sup>44</sup> When the sandstorm lifted on March 27, the advance thus continued afresh with no meaningful long-term effect from the delay. And even the combat maneuver units themselves continued fighting in several important cases, defeating Iraqi counterattacks and continuing urban actions in Najaf and elsewhere. While one cannot rule out the possibility of even worse weather, or of other or worse misfortunes from other dimensions of inanimate happenstance, our ability to absorb even potential setbacks like the sandstorm without significant effects suggests that the 2003 result may have been fairly robust against inanimate random variance.

What about animate random chance in the form of different Iraqi choices? Again, it is hard to rule out possible misfortune, since one can never exhaust the set of conceivable

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<sup>41</sup> Note that this is different from saying that the prewar planning was or was not sound. To assess prewar decisions requires assessment of what was known *at the time* or could have been known at the time. By contrast, the analysis here is after the fact, and is intended to assess what actually caused the observed outcome in light of everything we now know, in retrospect, about the facts of the war as actually fought. Our purpose is thus *not* to judge the prewar planning process (or the actions of the participants). One could conclude that luck had little to do with the actual outcome and still conclude that there was no way to have known this in advance, hence, *given what was known at the time*, it is impossible to determine whether inappropriate risks were - or were not - accepted. The analysis here cannot support a conclusion on the latter question.

<sup>42</sup> MHI: Tape 050303a1sb COL Allyn, et al. int.; Tape 050103p1sb LTC Gillette int.; Tape 050103p2sb MAJ Walter int.; Memorandum for the record, CAPT David Rogers, USN int., 26 June 2003, Fallon NAS, NV.

<sup>43</sup> MHI: Memorandum for the record, CAPT David Rogers, USN (DJ3, CFACC) int., 26 June 2003, Fallon NAS, NV; also Rick Atkinson, et al., "Confused Start, Decisive End," *Washington Post*, April 12, 2003, pp. A1ff.; John Diamond and Dave Moniz, "Air Campaign Shifts Aim to Guard," *USA Today*, April 2, 2003, pp. 4Aff.

<sup>44</sup> MHI: Tape 050903p2sb MG Christianson int.



variations: perhaps some other, as yet unidentified possibility could have been decisive. Yet most of the more plausible alternatives had been anticipated by Coalition planners and deliberately hedged against. Few seem likely to have caused serious, strategic-level setbacks - and for those few which might have, it is far from clear that larger forces would have made much difference.<sup>45</sup>

The Iraqis could, for example, have destroyed more of their bridges in an attempt to slow the Coalition advance. Iraqi bridge destruction, however, had received extensive planning attention, with the result that the majority of all the engineer bridging assets resident in the U.S. military had been deployed to southwest Asia and were in a position to provide rapid assault bridging to replace demolished Iraqi spans. Had this been necessary it would surely have delayed the advance somewhat, but the effect would have been in the nature of days rather than weeks or months.<sup>46</sup> It is unlikely that today's debate would consider OIF a high-cost campaign as a result.

Even without bridge demolition, the Iraqis could have made much more aggressive attempts to cut Coalition lines of communication (LOCs) by direct attack. The Coalition advance created a logistical lifeline over 500 kilometers long by the time V Corps and I MEF reached Baghdad. This LOC was mostly unguarded and very vulnerable. There were literally dozens of undefended bridges over the Euphrates that Iraqi paramilitaries could have used to gain access to supply routes and stage ambushes; most supply routes passed through or near cities that could offer cover and easy staging areas for attackers. As it was, Coalition logistics were strained near the breaking point by the speed and reach of the advance - LOC interdiction was an obvious possibility for Iraqi exploitation. Yet in 2003, the Iraqis systematically avoided LOC interdiction - instead they deliberately sought out Coalition tanks and infantry fighting vehicles and attacked these by frontal assault.<sup>47</sup> Early damage to logistical convoys (such as the ambush of the 507<sup>th</sup> Maintenance Company) appears to have been incidental to Iraqi plans, and was not systematically followed up. Indeed, by mid war, the Coalition stopped escorting logistical convoys after MG Stratman, the CFLCC Deputy Commanding General for Support, personally rode the main route and certified it safe for self-defending transport units.<sup>48</sup>

If the Iraqis had made a major effort at LOC interdiction they could surely have slowed the advance. They probably could not have halted it, however. The primary effects would likely have been three-fold. First, the Coalition would have been forced to pull combat units out of the advance to provide more robust escorts for resupply convoys. Second, logistical throughput would have fallen as convoys awaited escort and confronted delays in fighting through ambush attempts along resupply routes. Third, even well-escorted convoys would probably have suffered heavier losses from paramilitary attacks than did the heavily armored combat units that met most paramilitaries in the actual campaign. Collectively, these effects would have increased Coalition casualties and delayed the final assault on Baghdad. By the same token, though, the paramilitaries needed for LOC interdiction were the same fighters who were otherwise providing the main opposition to the spearhead's advance toward (and ultimately into) Baghdad - if the Iraqis had used

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<sup>45</sup> On the "branches and sequels" in the OIF plan and their role in hedging against uncertain Iraqi choices, see MHI: Tape 042703a1sb LTC Reilly int.; Tape 042803p2sb LTC Reilly int. continued.

<sup>46</sup> MHI: Tape 050903p1sb MG Kratzer int.

<sup>47</sup> MHI: Tape 050303a1sb COL Allyn, et al. int.; Tape 042903p1sb COL Brown, et al. int.; Tape 043003p2io COL Brown int.; Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050203a1io LTC Bayer, et al. int.; Tape 050903p1sb MG Kratzer int.

<sup>48</sup> MHI: Tape 050903p3sb MG Stratman int.



these units in LOC interdiction instead, this would have lightened the opposition in front of the advance. A smaller Coalition spearhead facing lighter opposition would also have consumed fewer supplies, reducing the throughput required to meet their needs. And it is extremely unlikely that Coalition spearheads could have been cut off entirely or left without fuel or ammunition: ill-equipped Iraqi paramilitaries could harass and ambush, but not permanently cut supply routes against heavily armed Coalition opposition; any attempt to hold a sustained blocking position across a supply route would have been annihilated by Coalition firepower. That same firepower in an escort role would have mitigated the risk of heavy casualties in the convoyed units; while losses would surely have been higher, we would still have had overwhelming combat power in the escorted convoys, hence the casualties would probably still have been light overall by historical standards. The net result would thus probably have been delay, but without a radical increase in Coalition cost on any other dimension. And given that, it is unlikely that a slower campaign looking otherwise much like the historical OIF would now be seen as a serious reverse.

The Iraqis could have tried to cut Coalition LOCs via a conventional mechanized counterattack, rather than interdiction by irregular paramilitaries. V Corps and CFLCC planners were in fact concerned about the possibility of an Iraqi counterattack from the vicinity of Al Amarah aimed at retaking Nasiriyah and severing the main supply route running through the city. As a result, however, the Iraqi forces that could have mounted this counterattack were under close scrutiny, and the Coalition was prepared both to engage them very heavily from the air (if they initiated any movement toward Nasiriyah), and to move ground forces into blocking positions astride the Iraqis' potential axes of advance.<sup>49</sup> It seems very unlikely that such a counterattack would have made much headway against such opposition.

Aside from LOC interdiction, another possibility for greater costs via different Iraqi choices would have been for them to carry out their threats to destroy oil fields or port facilities. They would have needed much more systematic preparations for demolition to do this, but it was probably within their ability if they had so chosen.<sup>50</sup> Properly done, such preparations could have enabled them to destroy entire oil fields the size of Rumaila or Kirkuk in minutes. This means, however, that if the Iraqis had taken this seriously and done the job right then there would have been little the Coalition could have done about it - even with much larger forces. A hair-trigger demolition system could not have been

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<sup>49</sup> MHI Tape 042903p2sb LTC Kerl, et al. int.; Tape 042903p1sb COL Brown, et al. int.

<sup>50</sup> Most plausible explanations of the Iraqi failure to destroy these facilities are consistent with the speculation that if these Iraqis had chosen differently they could have destroyed them. For example, if disloyal Iraqi civilians dismantled the demolition charges, this could only have been possible because the Ba'athist paramilitaries (whose primary job was to enforce loyalty) were elsewhere. If Saddam had chosen to allocate more of them to security duty, protecting the demolition charges from interference, then it is likely that this would have deterred most Iraqi civilians from interfering (as Saddam's control mechanisms had prevented disloyal behavior throughout his reign). Alternatively, if one sees the infrastructure's survival as the result of a threat Saddam had never meant to carry out, then he could simply have chosen differently and carried it out instead. Only if the failure is attributed to incompetence on the part of the Iraqi military and security services could one claim that it would simply have been impossible to destroy the infrastructure. Yet Saddam's security services were efficient enough to suppress dozens of coup attempts and enforce public loyalty throughout a 20-year reign; it is far from clear that they simply were not up to the job of preventing public sabotage of demolition charges. And Saddam's military proved perfectly capable of destroying oil fields in Kuwait in 1991. Iraqi predelegation of demolition authority could have made it impossible for Coalition jamming or attacks on Iraqi communications to have prevented demolition by keeping orders from getting through. All told, it seems likely that Saddam could have destroyed the oil fields if he had made different choices, and that the Coalition could probably not have prevented this had he done so.

preempted by even the fastest advance by even the largest forces.<sup>51</sup> Perhaps we were lucky the oil fields and the port at UmQasr survived – but if so, this was not because we accepted inappropriate risk via insufficient forces.

A different perspective on luck can be gained by looking at cases where the breaks *did* go the Iraqis' way – where Iraqi command decisions actually did create for them opportunities to fight the battle on their own terms, under conditions of greatest local advantage. For breaks to matter requires, logically, that the Iraqis have been able to make good on them. Were they?

A particularly interesting case in this regard is the action at Objective MONTGOMERY on April 4.<sup>52</sup> A full-strength Iraqi T-72 tank battalion from the Hammurabi Republican Guard division, with about a battalion of artillery in direct support, was dug in here along the crest of a berm astride Highway 10. To the berm's immediate front was a canal to serve as a water barrier; the berm followed a shallow arc, creating a natural kill sack along the Highway 10 approach route. A built up area just beside the highway screened the defensive positions from observation by an attacker moving up the highway until the attacker reached the kill sack some 1000 meters from the nearest Iraqi positions (and about 2000 meters from the furthest positions on the Iraqi left flank). Irrigation ditches alongside the highway prevented easy off-road movement, canalizing any attack from the front and enabling most of the defenders to engage a road-bound attacker from the flank.

At about 1500 hours on April 4, Troop A (or "Apache") of the 3-7 U.S. Cavalry drove directly into the kill sack, in column formation, along the expected Highway 10 approach route. Coalition air power had been called in support, but misidentified the defensive location and was instead engaged several kilometers to the southwest, hence the Apache Troop advance was unsupported from the air.

The Americans spotted the Iraqis as they opened fire. At least 16 rounds of 125mm T-72 main gun fire were observed. None hit. American return fire then wiped out most of the battalion in less than ten minutes, whereupon Apache Troop pulled back and American aircraft and artillery barraged the position to neutralize the Iraqis' dismounted infantry and destroy its supporting artillery. When the advance resumed the following morning the cavalry received only light fire from a handful of surviving dismounted infantry before clearing the position and continuing the advance.

If the Iraqis were ever going to fight a battle on their own terms, this should have been it. They enjoyed a numerical advantage of almost 2:1 in armored vehicles and nearly 3:1 in tanks.<sup>53</sup> They were in prepared defensive positions of their own choosing, on highly advantageous ground, and we attacked them frontally without extensive air support from precisely the direction they expected, driving straight into a prepared kill sack. Yet the Iraqis failed to inflict *any* losses before losing their entire battalion and all of its supporting artillery to an advance by a single U.S. cavalry troop. If the Iraqis were unable

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<sup>51</sup> Memorandum for the record, CW4 Crowder (Oil Fusion Team Head, CFLCC JACE) int., 12 May 2003, CFLCC HQ, Camp Doha Kuwait.

<sup>52</sup> The account below is drawn from MHI: Tape 050303p2sb LTC Ferrell, et al. int.; Memorandum for the Record, Objective MONTGOMERY Battlefield Inspection, 4 May 2003, with attached maps and photographs.

<sup>53</sup> The Iraqi 17<sup>th</sup> Battalion of the 17<sup>th</sup> Brigade of the Hammurabi Division fielded at Objective MONTGOMERY a force of 20 T-72 tanks, 2 M113 armored personnel carriers, 17 122mm and 152mm howitzers, 15 23mm and 37mm antiaircraft guns, and about 100 dismounted infantry. Apache Troop of the 3-7 Cavalry fielded 7 M1 tanks and 6 Bradley cavalry fighting vehicles. Iraqi prisoners report that the 17<sup>th</sup> battalion had arrived in the pre-prepared position a day prior to the attack, and was at full strength at the time of the battle. Ibid.



**Figure 2. Iraqi Defenses at Objective MONTGOMERY.**

to take advantage of opportunities like this, it is hard to see how more such opportunities could have materially affected the outcome. The breaks could have gone differently in OIF, but even good breaks have to be exploited. It is far from clear that these Iraqis were capable of exploiting many more breaks than they actually got.

#### **V. Analysis: Skill-Technology Synergy in OIF**

If speed, situation awareness, precision, or luck are not sufficient to explain the low cost of Saddam's ouster, then what must be added? Part of the answer lies in idiosyncratic features of Ba'athist Iraq: the Iraqis' failure to destroy oilfields and other economic infrastructure, for example, was ultimately their choice. Either Saddam never meant to carry out this threat, or his people refused to follow his orders, or his organization proved unable to implement his plan. But the failure of scorched earth was less our doing than theirs - even a different or less capable Coalition military might still have seen no scorched earth given the Iraqis' apparent unwillingness to carry out their threat, and even a very capable Coalition would have been unable to avert it if the Iraqis had been able and willing to follow through.

Much of the answer, however, lies in the interaction between our strengths and their particular weaknesses. That is, we argue that skilled use of modern Coalition technology interacted synergistically with Iraqi errors to produce unprecedented lethality and a radically one-sided military confrontation. Given this synergy, our skill and technology would probably produce similar results against other enemies as unskilled as the Iraqis, and with friendly forces no larger than 2003's. But because both technology *and* a major skill imbalance are required, the same Coalition skills and equipment would probably not produce comparable results against a more skilled opponent. In particular, the troop level required to destroy a skilled force the size of Saddam's military could well have exceeded that available in 2003, and the costs required could well have been significantly higher.

This is because skilled militaries can survive standoff precision engagement and compel close combat on terms unfavorable to us, and because such close combat, even with modern technology, is inherently dangerous and labor intensive when waged against a skilled opponent. To survive standoff precision and wage close combat effectively,

however, requires high tactical proficiency and an ability to exploit complex terrain for cover and concealment. The Iraqis in 2003 were anything but highly proficient. Their poor training and leadership produced a combination of mistakes, ill-prepared fighting positions, poor marksmanship, and flawed dispositions that left them fatally exposed to Coalition technology at all ranges. This in turn enabled a relatively small Coalition force to prevail in a short, relatively low-cost campaign – but it would be a mistake to assume similar outcomes against better prepared opponents.<sup>54</sup>

## Iraqi Ineptitude

To see why, it is useful to review some of the more serious of the Iraqis' many military shortcomings, and how these interacted with particular Coalition strengths in 2003. To begin with, Iraqi training was radically substandard in important respects, and especially in weapon employment. Most Iraqi fighters had fired little or no live ammunition in the year prior to the war; some had never fired their weapons at all. The 2<sup>nd</sup> Division of the Iraqi Regular Army, for example, had no live fire training in the twelve months prior to the war.<sup>55</sup> The 3<sup>rd</sup> Division held a single live fire exercise in which each soldier fired *four rounds* of ammunition.<sup>56</sup> None of the soldiers in the 11<sup>th</sup> Division's 3<sup>rd</sup> Battalion had fired their weapons in the past year.<sup>57</sup> Even the Baghdad Republican Guard division held only a single live fire exercise with just ten rounds for every soldier in the year leading up to the war.<sup>58</sup> By contrast, a typical U.S. infantry unit might fire 2,500 rounds or more of ammunition per soldier in an average year; for units preparing to enter combat that figure would be much higher.<sup>59</sup> The typical American infantryman might thus have had over 250 times as much target practice as even the best Iraqis.

Unsurprisingly, Iraqi marksmanship was thus very poor. Against 3ID's 3<sup>rd</sup> Brigade in Baghdad, Iraqi paramilitaries attained a hit rate of under ten percent for RPGs fired at ranges of under 500 meters.<sup>60</sup> At Objective MONTGOMERY west of Baghdad, an elite Republican Guard tank battalion fired at least 16 T-72 main gun rounds at ranges of as

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<sup>54</sup> For an analysis advancing a similar explanation of the 1991 Gulf War's outcome, see Stephen Biddle, "Victory Misunderstood: What the Gulf War Tells Us About the Future of Conflict," *International Security*, Vol. 21, No. 2 (Fall 1996), pp. 139-179. In fact, Iraqi performance in 1991 and 2003 was similar in many important respects, and this similarity played an important role in the effectiveness of U.S. technology in both conflicts. The Iraqis' failure to learn from their mistakes and improve their military skills in the intervening decade has, in turn, important implications for joint campaign assessment: some militaries (such as al Qaeda in Afghanistan) have demonstrated a significant ability to adapt on the basis of experience, others (such as Iraq) have not, and the difference is critically important for projecting the likely outcomes of conflicts. On al Qaeda adaptation in Afghanistan, see Stephen Biddle, *Afghanistan and the Future of Warfare: Implications for Army and Defense Policy* (Carlisle, PA: U.S. Army War College Strategic Studies Institute, 2002), pp. 19-21. On possible causes for the Iraqis' failure to adapt, see the discussion in "Conclusions and Implications" below.

<sup>55</sup> MHI: Col Mohammed Al Jboori, infantry Battalion commander, 2<sup>nd</sup> Division, attached to 45<sup>th</sup> Division, 4/24 PM, interviewed by Metz, Kidder, and Filiberti.

<sup>56</sup> MHI: Lt Col Ayad Hasam Aldemi, Brigade XO/D Co, 3<sup>rd</sup> ID, 4/23 PM, interviewed by Metz, Kidder, and Filiberti.

<sup>57</sup> MHI: Tape 042403a2sb Staff Colonel Alzadi int.

<sup>58</sup> MHI: SSG Ahmed Al Samar, company clerk, Baghdad Division of Republican Guard, 4/25 AM, interviewed by Metz, Kidder, and Filiberti. For similar examples from other units, see MHI: Tape 042403a2sb MAJ Al Tamimi int.; Tape 042303p2sb Staff Brigadier Raid Sajid int.; Tape 042403a1sb LTC Hamid int.; Tape 042403p1sb Staff LTC Alaragi int.; Tape 042503a1sb COL Alzanabi int.; Major Mohammed Abad, company commander, mechanized infantry, interviewed 4/24 by Metz, Kidder, and Filiberti; Captain Amer Taleb Alselane, platoon leader, artillery, 4/23 AM, interviewed by Metz, Kidder, and Filiberti; Lt Col Kassim Alajeel, regimental commander of local security unit, 4/25 AM, interviewed by Metz, Kidder, and Filiberti.

<sup>59</sup> DA PAM 350-38 1 (STRAC) Standards in Weapons Training, October 2002, ch. 5.

<sup>60</sup> MHI: Tape 050303a1sb COL Allyn, et al. int.

little as 800-1000 meters at tank-sized targets with full flank exposure – with *zero* hits at what amounted to pointblank range for weapons of this caliber. In fact, the nearest miss fell fully 25 meters short of the American troop commander's tank.<sup>61</sup> Similar results are reported from American and British combatants throughout the theater of war, and across all Iraqi weapon types employed in OIF.<sup>62</sup>

Iraqi tactics could charitably be described as self-defeating. Much of the close combat in OIF took the form of Iraqi paramilitaries charging Coalition armored vehicles on the outskirts of Iraqi cities using unarmored civilian vehicles. These were typically simple frontal assaults, fully exposed, with no apparent attempt to coordinate movement with suppressive fire, use terrain for cover, or employ smoke or other obscurants.<sup>63</sup> Moreover, they were usually directed at Coalition heavy armored units; Iraqi paramilitaries appear to have systematically avoided softer-skinned command or logistical elements in order to seek out Coalition tanks and infantry fighting vehicles.<sup>64</sup>

Iraqi position preparation was systematically inadequate. After their losses to American air power in 1991, the Iraqis understood that survival against air attack would be vital in 2003. They thus made an attempt to protect their ground forces from Coalition air power.<sup>65</sup> This attempt fell far short, however. They were able to provide some concealment for some units. But they were much less successful in creating adequate



**Figure 3. BMP, Objective SAINTS.**

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<sup>61</sup> MHI: Tape 050303p2sb LTC Ferrell, et al. int.; Memorandum for the Record, Objective MONTGOMERY Battlefield Inspection, May 4, 2003.

<sup>62</sup> See, e.g., MHI: Tape 050203p1sb LTC Schwartz, et al. int.; Tape 050303p1sb, LTC Pease int.; Tape 050303p1io MAJ Walter, et al. int.; Tape 043003a1io COL Toolan, et al. int.; Tape 043003p2io COL Johnson int.; Tape 062503p1sb MAJ P. int.; Tape 050203p1sb COL Perkins, et al. int.; Tape 050803a2sb MAJ Longman, et al. int.; 042903p1sb COL Brown, et al.

<sup>63</sup> MHI: Tape 050203p1sb LTC Schwartz, et al. int.; Tape 050303a1sb COL Allyn, et al. int.; Tape 050303p1sb LTC Pease int.; Tape 050303p1io MAJ Walter, et al. int.; Tape 050303p2sb LTC Ferrell, et al. int.; Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050103p2sb MAJ Robert Walter int.; Tape 050203p1sb COL Perkins, et al. int.; Tape 050803a1sb MAJ Maciejewski int.; Tape 050803a2sb MAJ Longman, et al. int.

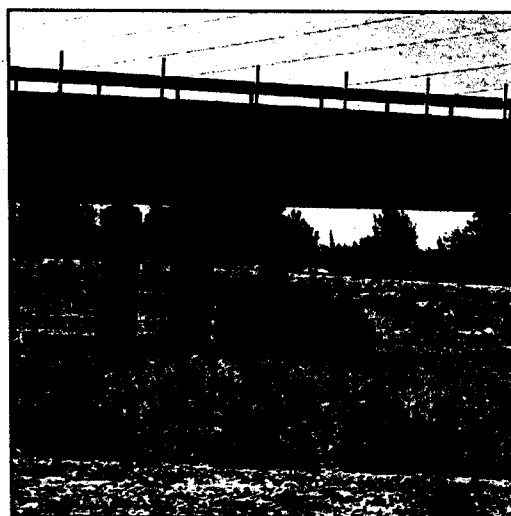
<sup>64</sup> MHI: Tape 050203p1sb COL Perkins, et al. int.; Tape 050303a1sb COL Allyn, et al. int.; Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050203a1io LTC Bayer, et al. int.

<sup>65</sup> See, e.g., MHI: Tape 042403a2sb MAJ Al Tamimi int.; Tape 042403a2sb Staff Colonel Alzadi int.; Tape 042403p1sb Staff LTC Alaragi int.

cover. And they were systematically unable to combine cover, concealment, and an adequate field of fire for their own weapons.

Figures 3-5 illustrate this problem with a series of photographs of representative Iraqi fighting positions from OIF. Figure 3 shows one of a formation of BMPs deployed under foliage concealment south of Baghdad. Large numbers of such positions were encountered by elements of the U.S. 3<sup>rd</sup> Infantry Division as it advanced north of the Karbala Gap. The combination of dense deciduous foliage and palm fronds here conceals the vehicle from overhead surveillance. Were the vehicle to be discovered, however, it is without any cover against fire, either from the ground or from overhead, and any advancing ground force would eventually discover such positions, as did the 3ID photographer who took the picture. Moreover, the same foliage that conceals the BMP from American observation also blinds its crew: the field of fire for the vehicle's weapons is extremely restricted. The position has some value as a hide location, but its lack of cover or offensive field of fire makes it nearly useless as a fighting position.

Figure 4 shows an Iraqi command vehicle found on the outskirts of Baghdad. Parked under a highway overpass, it enjoys some concealment from satellite photography or other observation from directly overhead. Observers not directly overhead, however, have a clear line of sight into the vehicle position, which offers no cover against fire from any direction other than straight down.



**Figure 4. Iraqi Command Vehicle, Baghdad Outskirts.**

Figure 5 shows a Republican Guard T-72 from the Objective MONTGOMERY battlefield west of Baghdad. The tank is parked behind a three-sided, horseshoe-shaped berm of loose sand pushed up by dozer blades. Such positions are extremely common throughout Iraq – literally thousands of them dot the landscape from Basra to Baghdad and beyond. Most are unoccupied; some contain wreckage or refuse presumably placed there to deceive sensors. Others, however, were used by Iraqi forces in combat, as here. Yet such positions offer no concealment – whether from overhead or from ground level: they are distinctive features of the landscape, and plainly visible both from the air and from great distances on the ground in all directions. Unlike the BMP position in Figure 3, they do offer a wide field of fire: the berm creates a hull defilade position with both optics and armament above the mask. They do not, however, offer much meaningful cover. Not only is the position completely exposed to overhead engagement by Coalition aircraft,

but a loose sand berm cannot stop 120 mm depleted uranium main gun rounds from M1 tanks on the ground. In fact, it barely slows them down. There are reports from M1 crews in the 1991 Gulf War who watched 120 mm rounds entering such berms, exiting the berm, entering the armored vehicles behind them, passing all the way through the target, and vanishing over the horizon.<sup>66</sup> All the berm really does against such opposition is to advertise the location of a potential Iraqi fighting position to Coalition observers - it offers little in the way of useable protection.



Figure 5. Iraqi T-72, Objective MONTGOMERY.

Perhaps the most serious Iraqi shortcoming was their systematic failure to exploit the military potential of urban terrain. Cities offer a natural source of cover and concealment, they canalize attacks, they facilitate barrier construction, they pose difficult problems of intermingling and collateral damage avoidance, and they make effective employment of standoff precision weapons much harder. The most plausible prewar scenario for heavy Coalition casualties was the prospect of prolonged urban battles in the streets of Baghdad, Tikrit, Najaf, Nasiriyah, Samawah, Basra, Mosul, and Kirkuk.

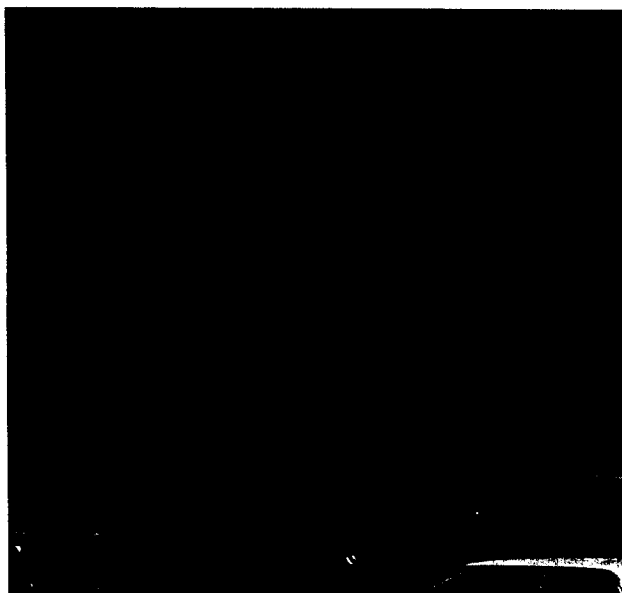
Yet the Republican Guard and Iraqi Regular Army systematically avoided major cities, deploying instead in rural areas and suburban outskirts. They appear to have been deliberately denied access to major city centers by the Iraqi high command.<sup>67</sup>

<sup>66</sup> See, e.g., Jesse Orlansky and Col Jack Thorpe, eds., *73 Easting: Lessons Learned from Desert Storm via Advanced Distributed Simulation Technology* (Alexandria, VA: Institute for Defense Analyses, 1992), IDA D-1110, p. I-54; *Operation Desert Shield/Desert Storm, Hearings Before the Committee on Armed Services, United States Senate* (Washington, DC: U.S. Government Printing Office, 1991), S. Hrg. 102-326, p. 115.

<sup>67</sup> MHI: Tape 042303p2sb Staff Brigadier Sajid int.; Tape 050403p1io LTC Sterling int.; Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050103p2sb MAJ Robert Walter int. Why did the Iraqis systematically deny their most favorable defensive terrain to their most capable units? Available evidence is insufficient to establish the reason with certainty, but Iraqi civil-military relations seem likely to have played a critical role. Saddam's palaces are located in Iraqi cities; his seat of government was in Iraq's largest city. Saddam was obsessed with the danger of coup d'etat at the hands of his own officer corps. Allowing large conventional military forces to deploy for long periods in city centers would pose a serious risk that rebellious officers in command of such large units could overwhelm Saddam's praetorian guards and paramilitary thugs and overturn the government. This presumably also affected Saddam's willingness to permit extensive live-fire marksmanship training: distributing live ammunition in large quantities to soldiers whose loyalty may be questionable could be dangerous for a regime like Saddam's. Iraq's radically conflictual civil-military relations thus posed a number of important barriers to Iraq's ability to conduct effective conventional military operations. For a somewhat more extensive discussion of the relationship between Iraqi military performance and Iraqi civil-military relations, see section VII, Conclusions, and associated references below.

The great majority of the true urban combat in OIF was against lightly armed irregular paramilitaries, who fought mostly on the tactical offensive, sallying out into the open to charge Coalition armored vehicles. Not only did the paramilitaries lack the heavy weapons or armor protection of Iraq's large mechanized formations, they also forfeited the tactical potential of urban terrain by taking the offensive in exposed, unprepared frontal assaults.<sup>68</sup>

More conventional Special Republican Guard (SRG) units deployed some heavy weapons, especially in Baghdad, but these were a tiny fraction of the total available to the Iraqi military. And even the SRG failed systematically to make effective use of urban terrain for their employment. The SRG's prepared positions were almost entirely outdoors, typically in shallow foxholes dug along the roadside or in simple sandbag emplacements on building roofs or at intersections (a typical example from downtown Baghdad is illustrated in Figure 6). SRG tanks were often simply parked in the open at major intersections, with no effort at cover or concealment (see, for example, the T-72 in Figure 7). Practically no buildings received the interior preparations that would be normal for urban warfare in Western practice, such as interior barricades, wall reinforcement, loophole construction, or wire entanglements. Outdoor obstacles, barriers, or minefields were almost completely absent.<sup>69</sup>



**Figure 6. Iraqi Fighting Position, Downtown Baghdad.**

As with Iraqi marksmanship, their failings in urban tactics have roots in poor training.

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<sup>68</sup> MHI: Tape 050203p1sb LTC Schwartz, et al. int.; Tape 050303a1sb COL Allyn, et al. int.; Tape 050303p1sb, LTC Pease int.; Tape 050303p1io MAJ Walter, et al. int.; Tape 050303p2sb, LTC Ferrell, et al. int.; Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050103p2sb MAJ Robert Walter int.; Tape 050203p1sb COL Perkins, et al. int.; Tape 050803a1sb MAJ Maciejewski int.; Tape 050803a2sb MAJ Longman, et al. int.

<sup>69</sup> MHI: Tape 050203p1sb LTC Schwartz, et al. int.; Tape 050303a1sb COL Allyn, et al. int.; Tape 050303p1sb, LTC Pease int.; Tape 050303p1io MAJ Walter, et al. int.; Tape 050303p2sb, LTC Ferrell, et al. int.; Tape 042903p2sb LTC Kerl, et al. int.; Tape 043003a1io COL Toolan, et al. int.; Tape 043003p2io COL Johnson int.; Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050103p2sb MAJ Robert Walter int.; Tape 050203a2sb LTC Bayer int.; Tape 050203p1sb COL Perkins, et al. int.; Tape 050803a2sb MAJ Longman, et al. int.



The Republican Guard and Iraqi Regular Army received no training whatsoever in urban warfare in the years leading up to the war.<sup>70</sup> In fact, Guard and Army commanders found the entire concept of city fighting unthinkable. As one Iraqi colonel put it: "Why would anyone want to fight in a city?" His troops "couldn't defend themselves in cities."<sup>71</sup> Only the Special Republican Guard was given any systematic training in conventional urban warfare, and even this was poor quality. The paramilitaries who shouldered much of the burden of actual city fighting in 2003 received no sustained conventional military training of any kind.<sup>72</sup>

Some Iraqi difficulties stemmed from political, rather than strictly military sources. The unpopularity of the Ba'athist regime, for example, made human intelligence (HUMINT) available on the locations of nominally concealed urban positions such as paramilitary command centers or ammunition caches in civilian buildings. Many Iraqi civilians hated the Ba'athist regime, and were at least initially sympathetic to Coalition forces. Civilians with knowledge of hidden assets' whereabouts were thus potentially available to provide targeting information. Of course, a major function of the Ba'athist paramilitaries was to deter such cooperation by the threat of violence if collaboration was discovered; as a result, HUMINT cooperation often developed slowly. Once the Ba'athists' vulnerability became apparent, however, and as it became clearer that they would be unable to hold their positions for long given their staggering loss rates in near-suicidal attacks on Coalition forces, Iraqi civilians gradually came forward with targeting information. This targeting information proved instrumental in attacking paramilitary command and communication nodes within major cities. Without this HUMINT from sympathetic civilians disaffected from Saddam's regime, locating often-austere urban command posts for standoff attack would have been very difficult. The illegitimacy of Ba'athist governance thus made targeting intelligence available that would be largely out of reach for urban offensives against more popular regimes.<sup>73</sup>

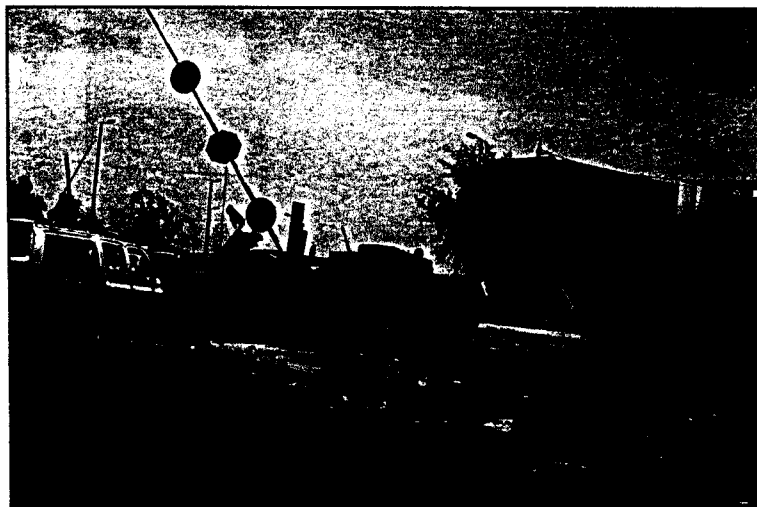


Figure 7.

<sup>70</sup> MHI: Tape 042303p2sb Staff Brigadier Sajid (Commandant, Iraqi Armor School) int.

<sup>71</sup> MHI: Tape 042403a2sb St. COL al Saadi int.

<sup>72</sup> MHI: Tape 042403a1sb LTC Hamid int.; Memorandum for the record, MAJ Colligan, et al. int., 26 April 2003, CFLCC HQ, Camp Doha Kuwait.

<sup>73</sup> MHI: Tape 050303a1sb COL Allyn, et al. int.; Tape 050203p1sb COL Perkins, et al. int.; Tape 050803a2sb MAJ Longman, et al. int.; Memorandum for the record, LTC C int., 12 May 2003, CFLCC HQ, Camp Doha Kuwait; MAJ Curtis int.

## Interactions between Iraqi Ineptitude, Coalition Technology, and Coalition Skill

The Iraqis' shortcomings left them extremely vulnerable to the Coalition's technological and training advantages. For example, the Regular Army, Republican Guard, and Special Republican Guard's inability to exploit complex terrain for cover and concealment left them exposed to the full weight of Coalition standoff precision strike. Coalition air forces were capable of delivering thousands of precision guided bombs and missiles a day, and could concentrate hundreds against a single point. Cruise and surface-to-surface missiles added still more precision firepower. Against such an armada, failure to secure cover and concealment can be lethal to hundreds of combatants in just minutes; the Iraqis' exposure enabled the Coalition to annihilate whole formations at safe distances, and persuaded many Iraqis to abandon weapons lest they suffer the same fate.<sup>74</sup>

But while precision weapons are tremendously lethal against exposed targets, they are much less so against opponents who exploit complex terrain for cover and concealment. In Afghanistan, for example, al Qaeda defenders successfully used the complex terrain of the Dar-ye Suf and Shah-i-Kot valleys to reduce their exposure to American surveillance and reduce their vulnerability to standoff precision engagement. At Bai Beche and Operation ANACONDA, al Qaeda fighters withstood long range bombing in sufficient numbers to compel sometimes bloody close quarters assaults by American and allied ground forces. Fewer than half the defenders of the Shah-i-Kot valley were found and killed by standoff precision engagement prior to the arrival of Western ground forces in close combat in Operation ANACONDA. In Kandahar province, al Qaeda defenders using local terrain for cover eluded preliminary air strikes and thwarted advances by friendly ground forces; al Qaeda counterattackers found sufficient cover to reach close quarters with American and allied forces before being driven back in hard fighting at point blank range.<sup>75</sup> In the 1999 Kosovo war, Serbian ground forces used wooded terrain and urban intermingling to thwart efforts by Western aircraft to find and destroy them with precision weapons.<sup>76</sup>

Standoff precision is valuable against any target, and any defender can expect to suffer against it. But it is far more effective against massed targets in the open than it is against covered, concealed targets in complex terrain. And whereas al Qaeda and the

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<sup>74</sup> Many Coalition units reported large quantities of abandoned but undamaged Iraqi equipment in their sectors as they advanced - in places as much as whole brigades of unoccupied Iraqi armored vehicles were counted as V Corps and I MEF passed through their positions: see, e.g., MHI: Tape 050203p1sb LTC Schwartz, et al. int.; Tape 043003a1io COL Toolan, et al. int.; Tape 062503a1sb LTC B int.; Tape 062503p1sb MAJ P. int.; Memorandum for the record, LTC Rodgers, LTC Marcoz int., 22 April 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050103p1sb LTC Gillette int.; Tape 050203a1io LTC Bayer, et al. int.; Tape 050203p1sb COL Perkins, et al. int.

<sup>75</sup> For detailed accounts, see Biddle, *Afghanistan and the Future of Warfare*, pp. 15-16, 26-43. Note that the indigenous Afghan Taliban (by contrast with the better-trained al Qaeda foreigners) were much less adept at exploiting cover and concealment, and suffered much more heavily under Western air attack: *ibid.*

<sup>76</sup> See, e.g., Ivo Daalder and Michael O'Hanlon, *Winning Ugly* (Washington, DC: Brookings, 2000), pp. 120-24; Stephen T. Hosmer, *Why Milosevic Decided to Settle When He Did* (Santa Monica, CA: RAND, 2001), pp. 77-90; Gen. Wesley Clark and Brig. Gen. John Corley, "Press Conference on the Kosovo Strike Assessment," NATO Headquarters Brussels, 16 September 1999; Barry R. Posen, "The War for Kosovo: Serbia's Political-Military Strategy," *International Security*, Vol. 24, No. 4 (Spring 2000), pp. 39-84; *idem*, "Command of the Commons: The Military Foundation of U.S. Hegemony," *International Security*, Vol. 28, No. 1 (Summer 2003), pp. 5-46.

Serbs largely denied us such easy targets, the Iraqi Regular Army, Republican Guard and Special Republican Guard did not.<sup>77</sup> The Iraqis' failures to reduce their exposure thus played into the strengths of the Coalition's technology, and enabled us to destroy Iraqi combat power from safe distances at a much higher rate than we could have done had they been better prepared.

Even so, some Iraqis survived standoff precision. Some hid in concealed but impractical locations, as did the BMP depicted in Figure 3. A few others managed to mount limited counterattacks, as did elements of the Hammurabi Division at Objective PEACH.<sup>78</sup> And some survived long enough to defend prepared positions against direct ground attack, as did the 17<sup>th</sup> Battalion of the Hammurabi's 17<sup>th</sup> Brigade at Objective MONTGOMERY.<sup>79</sup>

Here, too, however, the Iraqis' military shortcomings interacted with Coalition technological sophistication to produce extremely one-sided outcomes. The M1 tank's ability to fire on the move, hit targets on the first shot at ranges of multiple kilometers, and penetrate both sand berms and T72 frontal armor at the same distances made deathtraps out of the simple horseshoe revetments used by the Iraqis at Objective MONTGOMERY. Together with highly skilled U.S. crews, this technology allowed a single cavalry troop to devastate an entire battalion of dug-in defenders in less than 10 minutes of firing.

Had the Iraqis been better skilled, however, the same technological match up could have produced a much costlier outcome. The M1 is an extremely survivable tank, but no tank has equally resistant armor on all surfaces, and like all tanks, the M1's flank, roof, and floor armor is much thinner than its frontal arc. In Operation DESERT STORM, M1s were killed by T72 or BMP fire that struck them from the flank or rear; in OIF, even RPGs sometimes penetrated M1s when hit from the proper direction.<sup>80</sup> And six of Apache Troop's 13 armored vehicles were Bradley Fighting Vehicles without even the M1's level of flank armor protection. At Objective MONTGOMERY, the Iraqi position afforded flank shots by most Iraqi combatants against all of Apache Troop's tanks and Bradleys - at ranges of as little as 800-1000 meters.<sup>81</sup> A well-trained tank battalion would expect to hit with nearly every shot at such ranges; the 16 or more shots fired by the Iraqis at Objective MONTGOMERY could thus easily have wiped out Apache troop, for example, if fired by crews with skills anything like their American attackers'.

The most important source of close combat in OIF, however, was urban warfare. Paramilitaries in civilian clothes and intermingled with the population offered poor targets for air attack; many thus survived to engage Coalition ground forces at close quarters in Iraqi cities. Even without standoff precision engagement, however, other Coalition technologies still interacted with Iraqi ineptitude and Coalition skill to yield annihilation. In particular, the modern armor technology of the M1 and Challenger tanks offered extraordinary protection, and their fire suppression, blast localization, and crew escape systems often made it possible to survive even a large-caliber penetration of the armor envelope. The ability of Bradley Fighting Vehicles as well as Abrams tanks to shoot on the move with both accuracy and tremendous volumes of fire made them

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<sup>77</sup> And where they were able to conceal themselves from Coalition surveillance, they were typically unable to provide cover from fire or meaningful fields of fire for their own weapons (see above) - unlike al Qaeda in Afghanistan.

<sup>78</sup> MHI: Tape 050203a2sb LTC Bayer int.

<sup>79</sup> MHI: Tape 050303p2sb LTC Ferrell, et al. int.

<sup>80</sup> Scales, et al., *Certain Victory*, pp. 267-70; MAJ Jeffrey R. Voigt, et al., *V Corps Battle Damage Assessment (BDA) Out Brief*, U.S. Army Acquisition Corps, 28 April 2003.

<sup>81</sup> MHI: Tape 050303p2sb LTC Ferrell, et al. int.; Memorandum for the Record, Objective MONTGOMERY Battlefield Inspection, 4 May 2003.

extremely lethal even to hostile armored vehicles, much less paramilitary foot soldiers. For the latter to launch themselves in frontal assaults at such well-protected, highly lethal targets with nothing more than civilian pickup trucks and RPGs was clearly suicidal. Even where the paramilitaries fought on the tactical defense, as in their resistance to 3ID's "Thunder Runs" in Baghdad, the combination of the paramilitaries' shortcomings and the Americans' lethality meant that tremendous numbers of Iraqis would be mowed down: without adequate cover or concealment once firing had given them away, Iraqi paramilitaries were dangerously exposed. And whereas the Iraqis' fire often missed, Coalition return fire was both voluminous and deadly accurate - exposed paramilitaries thus rarely survived to fire again.

Yet here, too, better trained Iraqis could have produced a very different outcome even with exactly the same equipment on both sides. The light weapons wielded by Iraqi irregulars *can* penetrate M1 and Challenger tanks - in fact, at least nine M1s were disabled by RPG fire in OIF.<sup>82</sup> If the hundreds of RPGs fired at 3ID in the two "Thunder Runs" alone had been fired accurately, the penetration rate could have been dramatically higher. And if the shooters had been firing from covered, concealed positions, they could reasonably have expected to survive their first shot at a much higher rate, enabling them to shoot again and thus increasing the hit rate even further.

Most important, though, a skilled urban defender could not have been broken by an all-mounted assault of the sort waged in Baghdad and Basra. The Iraqis of 2003 were exposed and could thus often be slaughtered in the open even within the city center without the attacker dismounting from its armored vehicles. By contrast, a defender who exploited the natural potential of urban terrain by remaining in cover to fire from within buildings, who prepared those buildings for maximum cover and concealment, who used barriers and obstacles to canalize attacks into prepared ambushes, and who used covered retreat routes to slip away for subsequent engagements a couple of blocks away, would have been a much tougher target. Historically, it has been impossible to destroy such urban defenders without supporting armored advances with dismounted infantry who can enter building interiors to clear rooms, kill concealed defenders, and hold the building interiors to prevent their reoccupation by defenders. Mounted vehicle crews simply cannot find properly-concealed defenders in building interiors. And unless such defenders are cleared before the armored vehicles advance, the vehicles' weaker roof, rear, and flank armor risks easy penetration from bypassed but unseen defenders. Working together, skilled dismounted infantry and supporting armor can clear urban terrain, but they cannot do so cheaply if the defender makes the most of that terrain: even with skilled attackers, and even with armored support, dismounted building clearance against skilled defenders has typically been very costly. Recent exercises by the U.S. Marine Corps have suggested that against skilled urban defenders, even well-trained attackers might expect little better than a 1:1 loss exchange ratio (LER),<sup>83</sup> a 1:1 LER against multiple thousands of Iraqi urban defenders would have produced thousands of friendly casualties and a much costlier outcome for OIF, even given the technological advantages of the Abrams and the Challenger.

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<sup>82</sup> MAJ Jeffrey R. Voigt, et al., *V Corps Battle Damage Assessment (BDA) Out Brief*, U.S. Army Acquisition Corps, 28 April 2003.

<sup>83</sup> Greg Jaffe, "Urban Warfare," *Deseret News*, September 1, 2002, pp. AA02ff.; Scott Peterson, "Iraq Prepares for Urban Warfare," *Christian Science Monitor*, October 4, 2002, pp. 1ff.

## Counterfactual: What if the Iraqis Had Been Better Skilled?

More broadly, the analysis above implies a counterfactual claim for the operation as a whole: if an interaction between skill and technology was key, then the same technology against a more skilled enemy should have produced a very different outcome. That is, if the Iraqis had possessed U.S. skills but Iraqi equipment, U.S. losses should have increased to levels where the war would not today be seen as "low cost," even with the same U.S. technology. It is impossible to prove a counterfactual, but is this reasonably plausible, given what we now know about the conduct of the war?<sup>84</sup>

Two issues are of primary significance for this question: what if the Iraqis had exploited urban terrain to its natural potential, and what if the Iraqis had combined this with a more systematic counter-LOC campaign? As for the first, the Iraqis we actually fought forfeited most of the advantages of urban terrain; by contrast, a skilled urban defense could have negated many of our most important technological advantages. Most important, it would have produced many fewer exposed targets for standoff precision engagement, and it would have compelled a much heavier use of dismounted infantry to clear properly-defended buildings, as noted above. The inherent risks of dismounted warfare against skilled defenders in properly prepared urban positions would surely have induced much heavier Coalition casualties. And if the Iraqis had been willing to deploy most of their military in urban areas, the defenders of those cities would have had much greater access to heavy weapons - especially, large caliber anti-tank systems. Instead of RPGs and small arms, the columns entering Baghdad, Basra, Nasiriyah, Najaf, and Samawah would have faced 125 mm antitank guns and wire-guided missiles. Skilled use of plentiful crew-served antitank weapons in urban terrain would surely have produced a much higher rate of hits and penetrations of the thinner-skinned flank, rear, and roof armor surfaces of Coalition M1s, Challengers, Bradleys and Warriors. Taken together, a skilled defense of Iraq's cities using the preponderance of Iraq's conventional military

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<sup>84</sup> *Counterfactual analyses* (sometimes called "thought experiments," or *gedankenexperiments*) hypothesize a change in a historical event, then deduce plausible consequences of this change. All claims that something caused something else imply specific counterfactuals: if one says that x caused y, this implies that if x had not happened, then y would not have happened; this if-then statement is a counterfactual. If the counterfactual implication is plausible, this supports the causal claim; if the counterfactual is implausible, this casts doubt on it. Careful examination of a claim's counterfactual implications can thus be a useful way to shed light on the claim's validity. In fact, counterfactual reasoning is at the heart of causal inference in social science: see, e.g., Philip Tetlock and Aaron Belkin, eds., *Counterfactual Thought Experiments in World Politics* (Princeton: Princeton University Press, 1996); James Fearon, "Counterfactuals and Hypothesis Testing in Political Science," *World Politics*, Vol. 43 (1991), pp. 169-195; King, Keohane, and Verba, *Designing Social Inquiry*, pp. 76-91. The counterfactual examined here is the most policy-relevant of several theoretically important counterfactual implications for military cause and effect in OIF. In addition to the "skilled Iraqis" counterfactual presented below, the causal claim presented here also implies, for example, that reducing U.S. skills to Iraqi levels would produce a dramatic difference in outcome (even with the same technology imbalance); that reducing technological sophistication to, say, 1970s levels should increase U.S. losses to levels comparable to those of pre-1991 Mideast wars with major skill imbalances; and that raising Iraqi technological sophistication to parity with the U.S. would make less difference for outcomes than stipulating equal skill levels on the two sides (since the Iraqis would be unable to use this technology to anything like its theoretical potential, whereas our skill enables us to exploit much more of our technology's capacity). Some of these additional counterfactuals have been addressed: the U.S. Army's Center for Army Analysis, for example, is addressing the effects of putative skill and technology variations in Iraq via simulation analysis (forthcoming). The effects of reduced U.S. skill and technology (as well as the increased-Iraqi-skill case considered below) were assessed systematically via a series of Janus analyses on the 73 Easting database from the 1991 Gulf War in Biddle, "Victory Misunderstood," pp. 139-79 at 165-73. The latter yielded results consistent with the causal claim presented above. But only the "increased Iraqi skill" case is considered in detail here.

would probably have induced a much harder, much slower, much bloodier battle than the open-terrain rural action that the Iraqi Regular Army and Republican Guard actually fought.

At the theater level, this could well have produced a very different set of possibilities for counter-LOC warfare by irregulars. If Iraqi conventional forces had shouldered the bulk of the urban combat, this would have freed Iraqi paramilitaries for use against Coalition LOCs. And if those paramilitaries had undertaken a systematic interdiction campaign with skilled partisan tactics, they could have posed much more serious problems for the Coalition offensive than the unskilled thugs of 2003 were able to mount. A large-scale, costly urban battle would have been very demanding of Coalition logistical throughput and Coalition combat forces to maintain a numerical edge in close combat. Wide-scale, systematic Iraqi interdiction of a 500-kilometer LOC with skilled partisans would have slowed logistical throughput significantly even with a major redirection of combat forces into convoy escort, and that redirection of combat forces would have mattered much more for the conduct of offensive operations at the point of the spear if the spearhead had been fighting competent, heavily armed opponents in complex terrain. For the unskilled Iraqis of 2003, LOC interdiction could at most have slowed the offensive at the margin. But for a skilled defender able to combine adept partisan warfare with a stiff defense of multiple major urban areas, LOC interdiction could have been much more effective. It is not implausible to suppose that Coalition casualty rates in such a war could have exceeded 2003's by an order of magnitude or more.

But would we have fought such a war? Faced with skilled, well-prepared urban defenses, would we have agreed to fight on Iraqi terms by wading into city centers with dismount-led combined arms teams, or would we instead have besieged them? Could we not have surrounded the cities while allowing a combination of precision air strikes and lightning raids to pressure Iraqis into surrender by destroying key nodes?

This is surely what we would have tried had we confronted such opposition. In fact, the British actually adopted similar methods at Basra, investing the city rather than invading it and waiting for precision strikes to induce some sort of systemic collapse in the city's defenses.<sup>85</sup> The results are illuminating. No such systemic collapse occurred. There were reports of an abortive uprising in one part of the city, but it is unclear how significant this was and it clearly failed to overturn Ba'athist control of the city or unhinge its military defenses. After holding out through a two-week siege, Basra was taken only by direct assault: a British "Thunder Run" of multiple armored columns drove straight into the city center and destroyed its garrison, much as the U.S. 3<sup>rd</sup> Infantry Division did in Baghdad without Basra's preliminary siege phase. Perhaps the siege somehow undermined the morale of the city's defenders, but it is more likely that their limited military skills left them unable to defend it effectively at any point, with or without a siege.

Moreover, it is far from clear that we had sufficient forces in the theater to invest multiple Iraqi cities, simultaneously, in the face of aggressive partisan action against Coalition LOCs. In the 2003 campaign, we deliberately bypassed or destroyed Iraqi resistance in urban areas in order to preserve the maneuver strength needed to continue the advance. We lacked the forces to conduct open-ended sieges of all the key cities along the way to Baghdad; and without the bridges many of those cities controlled, our

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<sup>85</sup> MHI: Tape 050803a1sb MAJ Maciejewski int.; Tape 050803a2sb CPT Ryan int.; Tape 050803a2sb MAJ Longman, et al. int.

ability to sustain a siege of other cities deeper in the country would have been reduced accordingly. With large forces tied down in LOC security, we would inevitably have been forced to leave many Iraqi cities – and possibly Baghdad itself – in Ba’athist control without even a loose cordon of Coalition forces outside. And the countryside would have remained almost wholly in Ba’athist hands.

This in turn would have reduced the ability of either standoff precision or airmobile raids to destroy key nodes in the city centers. Much of the intelligence used to direct standoff attacks on such targets in 2003 was derived from human sources, typically sympathetic civilians who became willing to approach our special forces once they became convinced that the Ba’athists would not survive. With Coalition forces bogged down and with the Ba’athists remaining in apparently long-term control of large sections of the countryside and important urban centers, it would have been harder to persuade vulnerable civilians to come forward. It is far from clear that we could have developed enough information under such circumstances to have mounted an effective “key node” targeting campaign.

The result could well have been an extended stalemate, with Coalition forces pinned down in static sieges across Iraq, beset by partisan warfare against overstrained, overstretched LOCs, and facing a steady loss of lives to guerilla actions against patrols and garrisons even without an assault on a city center. Barring decapitation of the Iraqi regime via a lucky shot against Saddam and his key lieutenants, this could have produced a very long war. In the face of a lengthening, apparently open-ended stalemate with a constant loss of American life, the political pressures to do something to end the deadlock would eventually have become very difficult to resist. And this would eventually have produced calls to force the issue with a direct assault against the key urban objectives on the ground.

Given this, it is hard to rule out the possibility of an eventual requirement for a direct ground assault on defended cities – even if we tried to avoid it via siege first. And a ground assault on a well-defended city would clearly be a very costly undertaking.

Overall, it is thus at least plausible to suppose that a skilled Iraqi defense could have induced casualties high enough to alter today’s perception of a low-cost campaign to topple Saddam. And this, in turn, is consistent with the implications of the skill-technology synergy thesis advanced above.

## VI. Analysis: Jointness

An important dimension of skill in modern warfare is jointness, or the ability to integrate operations across Service boundaries. Combined arms, or the integration of different weapon types on the battlefield, has long been considered a key component of military skill; as warfare becomes more complex, the scale of integration needed to get the most out of modern technology has grown, placing an increasing premium on the ability to coordinate capabilities that reside in different Services.

Joint integration is extremely challenging. Few militaries do it very well, and the Iraqis failed utterly in this regard: the Iraqi air force played no meaningful role in the conflict, and the various Iraqi land services (the Regular Army, Republican Guard, Special Republican Guard, and the respective paramilitary organizations) operated independently of one another, with no evidence of meaningful cooperation. The Iraqi military failed even to



integrate basic ground force branches such as infantry and artillery; the higher order integration required for joint warfare was far beyond their reach.<sup>86</sup>

By contrast, Coalition (and especially American) forces in OIF proved very adept at joint warfare. Improving joint integration has been a major focus of American defense policy since at least the Goldwater-Nichols Act of 1986, and American military operations since the first Gulf War in 1991 have displayed increasing proficiency in joint warfare. In 2003, Service interactions were broad, deep, and profound, ranging from tight integration of close air support (CAS) with ground maneuver to the use of Army logistical assets to support Marine combat units inland, the use of Naval aircraft to support Army Special Forces, the use of Air Force tankers to refuel Navy aircraft, the use of joint-Service teams to plan and conduct operations, or even the increasingly joint mindset of senior and field grade officers who have now spent significant portions of their careers working and training with peers in their sister Services. This scale of joint integration clearly increased Coalition combat power, and improved the viability of a ground force that many have argued was undersized. In fact, all participants questioned on the point were emphatic on the utility of joint integration and the tightness of the integration actually achieved in OIF.<sup>87</sup>

Coalition jointness was thus an important contributor to the skill differential between Coalition and Iraqi forces that plays such a central role in the skill-technology synergy thesis described above. Improved joint integration was an important accomplishment in 2003, and justifiably plays a large role in many of the war's after-action reviews and lessons learned analyses. Closer joint integration was clearly a good thing in OIF; we need to maintain it, we need to increase it, and we should not go to war without it. It may well prove critical to success in future conflicts, and is worth cultivating carefully.

By the same token, though, magnitudes still matter. As with speed, precision, and situation awareness, jointness was very helpful in 2003. But how helpful? In an unconstrained world, all virtues are worth having; in a world of financial and other constraints, virtues often trade off against one another.

In particular, it has long been argued that the American military maintains expensive and duplicative capabilities in different Services, and that better joint integration would make it possible to reduce these redundancies and save both money and end strength in the process. The Army and Marines have tube artillery to support engaged ground forces; Air Force, Navy, and Marine aircraft flying CAS can strike the same targets. The Army and Marines have large fleets of helicopters designed for CAS-like missions; the Air Force, Navy and Marines own fixed-wing aircraft that could perform similar roles. The Army has long range surface-to-surface missiles for deep strike; the Air Force has aircraft that can strike the same targets. The Army and Marines both plan to wage expeditionary warfare in theaters without a large preexisting base structure, and the Marines increasingly plan to operate well inland with diminished dependence on over-the-shore or port-dependent lines of communication. Of course, none of these similarities are completely redundant – in each case different Services offer something unique and potentially important. But there are nevertheless important areas of overlap, and since at

<sup>86</sup> See, e.g., MHI: Tape 050303a1sb COL Allyn, et al. int.; Tape 042903p1sb COL Brown, et al. int.; Tape 062503p1sb MAJ P int.; Tape 050103p1sb LTC Gillette int.; Tape 050203a1io LTC Bayer, et al. int.; Tape 050203p1sb COL Perkins, et al. int.; Tape 050803a2sb MAJ Longman, et al. int.

<sup>87</sup> See, e.g., MHI: Tape 050303a1sb COL Allyn, et al. int.; Tape 050103p1sb LTC Gillette int.; Tape 042703a3sb COL Workman, et al. int.; Tape 042903p2sb LTC Kerl, et al. int.; Tape 062403p1sb LTC K int.; Tape 050203p1sb COL Perkins, et al. int.; Tape 050903p3sb MG Stratman int.; Memorandum for the record, LTC C. int., 12 May 2003, CFLCC HQ, Camp Doha Kuwait.



least the mid-1990s there has been ongoing interest in realizing economies by reducing the overlap and relying on joint integration instead.<sup>88</sup> Was the jointness displayed in 2003 powerful enough to warrant such a restructuring?

The evidence does not permit a definitive answer. In part this is because of the multidimensional nature of "jointness" and the encompassing way in which the term is often used in the policy debate. Since Goldwater-Nichols, the U.S. military has promoted jointness in many ways, large and small, that cut across much of what the military does, how it trains and educates itself, and how it selects officers for promotion. How, then, can one identify for analysis some discrete variable called "jointness" and establish its role when the concept is so unbounded and expansive? For assessing speed, precision, and situation awareness, the scale of urban close combat is an analytically critical bellwether – any explanation of radically low losses that cannot accommodate large-scale but low cost close combat in urban terrain is insufficient. And it is difficult to see how speed, precision, and situation awareness – for all their virtues – can account for this. By contrast, jointness is so encompassing a property that it could in principle be seen to account for almost anything, including success in urban close combat. The "Thunder Runs" in Baghdad, for example, involved heavy direct-fire ground combat, but they were also supported by fixed-wing CAS called in by officers traveling with the moving columns on the ground.<sup>89</sup> CAS was called in support of urban combat elsewhere in the theater, too, using both rotary- and fixed-wing platforms from multiple Services.<sup>90</sup> Close cooperation between conventional forces and SOF played a role in developing HUMINT for targeting otherwise concealed urban command centers and critical facilities.<sup>91</sup> These contributions were clearly helpful, and played some role in the low cost of OIF's urban close combat. But *how* important a role? Were they helpful but not decisive, helpful and necessary for success, necessary but insufficient in themselves, or necessary *and* sufficient?

These logical distinctions are important for establishing the relative importance of jointness for the low cost of Saddam's ouster – and its implications for transformation proposals that may include reductions in Service redundancies to pay for faster modernization – but they cannot be sorted out without a more specific articulation of the claim for jointness' role.<sup>92</sup> Without a more delimited claim for the role jointness played in

<sup>88</sup> See, e.g., *Directions for Defense: Report of the Commission on Roles and Missions of the Armed Forces* (Washington, DC: USGPO, May 1995); Sam Nunn, "The Defense Department Must Thoroughly Overhaul the Services' Roles and Missions," *Vital Speeches* 20 (August 1, 1992), pp. 717-24. On this issue's role in today's debate, see Robert Burns, "Rumsfeld Doesn't Want Military Expansion," *Washingtonpost.com*, January 13, 2004.

<sup>89</sup> MHI: Tape 050203p1sb COL Perkins, et al. int.

<sup>90</sup> See, e.g., MHI: Tape 042903p2sb LTC Kerl, et al. int.; Tape 050303a1sb COL Allyn, et al. int.; Tape 043003a1io COL Toolan, et al. int.; Tape 050203a1io LTC Bayer, et al.

<sup>91</sup> MHI: Memorandum for the Record, LTC C interview, 12 May 2003, CFLCC HQ, Camp Doha Kuwait.

<sup>92</sup> Methodologically, to assess the relative contribution of multiple causes requires an asserted causal mechanism that articulates the way in which the cause is held to produce the effect; this causal mechanism permits process tracing wherein the steps in the mechanism are checked for consistency with the evidence; the more concrete the mechanism the more rigorously the thesis can be assessed. See, e.g., King, Keohane and Verba, *Designing Social Inquiry*, pp. 85-87, 219-223, 225-28. The encompassing nature but incomplete specification of the jointness argument, however, makes rigorous process tracing very difficult.

<sup>93</sup> To date, the most clearly articulated case for jointness' role in 2003 turns on the improvement in jointness since 1991, and especially, the use of a common battlespace in 2003. In *DESERT STORM*, it is argued, the Services occupied separate, largely non-overlapping battlespaces within which they fought largely independently of one another. In *IRAQI FREEDOM*, by contrast, all fought within the same battlespace: operations were integrated, not deconflicted. As CENTCOM Commander GEN Tommy Franks put it: "We saw for the first time the integration of forces rather than the deconfliction of forces, a very substantial point. In my experience, which spans some 38 years in uniform, I have seen -- I have seen the operations of services and nations deconflicted. This is the first joint and combined operation I've witnessed during my time in the service . . . . We saw jointness, we saw precision fires, command and control technologies,

urban close combat, available evidence cannot provide a definitive test.<sup>93</sup>

In large part, however, the difficulty lies in the nature of the Iraqi opposition in 2003. As with technology, the effects of skill depend on the enemy. And the Iraqi enemy in OIF was extremely permissive. We can ensure that our forces will be as joint – or more so – in future conflicts. But we cannot necessarily ensure that future opponents will be as inept as the Iraqis. And this suggests caution in assessing jointness' ability to produce similar outcomes elsewhere: jointness' contribution, like everything else's, was powerfully influenced by the nature of the Iraqi opponent.

In 2003, for example, the Iraqis found it difficult to integrate mobile air defenses with shifting urban ground operations, and were unable to ensure adequate concealment for either. Against the exposed targets that resulted, and in the relatively permissive air space that afforded, tightly integrated urban CAS was highly effective, contributing to a very low friendly loss rate on the ground.<sup>94</sup> Would CAS be as successful against better concealed or better defended targets elsewhere? Perhaps. But it cannot be established from the evidence of 2003. A virtue of organic mortars and howitzers is that they can provide very responsive fires to local commanders, even in economy-of-force sectors. In 2003, CAS was extremely responsive in critical engagements, but of course could not be available everywhere all the time. The economy-of-force action on the Green Line was never very hard-pressed in 2003, posing few serious resource allocation crises for non-

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equipment readiness, the state of training of our troops, and coalition support as very clear, above the line winners in Operation Iraqi Freedom." Operation Iraqi Freedom, Hearing Before the House Armed Services Committee, July 10, 2003. Similarly, Secretary of Defense Donald Rumsfeld has argued: "For my part, I'd say some key lessons so far include . . . the importance of jointness, and the ability of U.S. forces to fight, not as individual, deconflicted services, but as a truly joint force – maximizing the power and lethality they bring to bear." Donald Rumsfeld, Testimony Before the Senate Armed Services Committee, July 9, 2003. For very similar articulations, see Paul Wolfowitz, Testimony on U.S. Military Presence in Iraq: Implications for Global Defense Posture, delivered to the House Armed Services Committee, June 18, 2003; ADM Edmund Giambastiani, Testimony Before the House Armed Services Committee, October 2, 2003; also, e.g., Gen. Peter Pace, Comments to the Defense Writers Group, September 24, 2003; Andrew Krepinevich, *Operation Iraqi Freedom: A First-Blush Assessment* (Washington, DC: Center for Strategic and Budgetary Assessments, 2003), pp. 20ff.; Thomas Donnelly, "Lessons of a Three-Week War," *The Weekly Standard*, April 28, 2003. The difference between separate and shared battlespace could certainly confer important military advantages; moreover, this is an observable difference that can in principle be tested: one can compare experience from 1991 with that from 2003 and see whether the difference in Coalition behavior correlates with the implied difference in outcomes. Yet the comparison hardly demonstrates the causal necessity of shared battlespace for low cost victory in Iraq. On the contrary, the Coalition loss rate was lower in 1991, when battlespaces were separate, than in 2003, when they were shared: in 1991, the Coalition loss rate was less than 1 in 3,000, as opposed to the roughly 1 in 2,300 of OIF: Lawrence Freedman and Efraim Karsh, *The Gulf Conflict, 1990-1991: Diplomacy and War in the New World Order* (Princeton: Princeton University Press, 1993), p. 409. Of course, DESERT STORM and OIF are very different cases – this is not a perfectly controlled comparison. But it is far from clear that 1991's low losses in the absence of 2003's jointness can be attributed to scenario differences. After all, American attackers in 1991 repeatedly overran prepared, actively resisting Republican Guard defenders at local force ratios of parity or worse in frontal assaults with negligible losses: see, e.g., Robert H. Scales, Jr., et al., *Certain Victory: The United States Army in the Gulf War* (Washington, DC: Office of the Chief of Staff, U.S. Army, 1993), pp. 261-5, 267-70, 282-4, 292-300. If this was possible, then it is at least plausible that 2003's more-extensive war aims, for example, could have been attained at very low cost in 1991 as well, even without 2003's superior jointness. And this in turn would imply that 2003's jointness (or this aspect of it), though helpful, might not have been logically necessary for the low cost of Saddam's ouster. Either way, the burden of proof in asserting a causal claim (for jointness' 2003 role, in this case) lies normally with those asserting the claim. That burden has not yet been met in analyses of jointness' contribution to OIF.

<sup>94</sup> Even in OIF, however, enemy air defenses were able to pose important challenges. The low-tech defense against the 11<sup>th</sup> Attack Helicopter Regiment's raid on March 23, for example, damaged every aircraft in the raid. And the CAS effort in support of 2 BCT's second "Thunder Run" on April 7 cost the Air Force an A10 shot down while flying low enough to offer effective support. See MHI: Tape 050103p1sb LTC Gillette int.; Tape 050203p1sb COL Perkins, et al. int.

<sup>95</sup> On CAS responsiveness in support of the Coalition main effort, see, e.g., MHI: Tape 050303a1sb COL Allyn, et al. int.; Tape 050103p1sb LTC Gillette int.; Tape 050203a1io LTC Bayer, et al. On CAS responsiveness on the Green Line, see Tape 062403p1sb LTC K int.; Tape 062503p1sb MAJ P int.

organic assets like CAS.<sup>95</sup> Would heavier reliance on non-organic aerial fire support be sufficient to avert heavier losses away from the point of attack against a more resourceful enemy in some future conflict? It might. But the experience of 2003 offers little conclusive evidence. SOF support proved very helpful to conventional forces in OIF, but maximum SOF effectiveness normally requires time – both to plan SOF missions and to develop rapport between SOF operators and sympathetic civilians willing to offer targeting guidance on hidden urban assets.<sup>96</sup> Against the Iraqis, these time constraints were not decisive. Would conventional-SOF integration be as fruitful in a future conflict where short timelines meant greater risks? Perhaps. But the 2003 experience cannot establish this.

Either way, joint integration was clearly very helpful in 2003. And none of this constitutes a hard proof that some form of “jointness” was not logically necessary for low-cost victory in 2003. The evidence on this point is inconclusive, not disconfirmatory. Jointness was clearly an important contributor to the skill differential that the skill-technology thesis sees as so important for the low cost of toppling Saddam. It is clearly in America’s interest to promote the closest possible integration of military operations across Services, and whatever its role in 2003 it could quite possibly tip the balance in future wars elsewhere. None of this, however, constitutes a demonstration that jointness’ power is sufficient to enable a significant restructuring to reduce apparent redundancies in Service capabilities. A transformation agenda in which closer joint integration enables efficiencies in force structure or economies in apparently overlapping modernization programs may or may not be wise, but OIF does not offer conclusive support either way. And either way, the importance of the interaction between our strengths – including our skill in joint operations – and the Iraqis’ weaknesses counsels great caution in extrapolating outcomes obtained in 2003 to other environments where enemy skills may be significantly better.

## VII. Conclusions and Implications

The radically low cost of Saddam’s ouster thus cannot be explained by reference to Coalition strengths alone. Speed, precision, and situation awareness surely contributed to this outcome – and some combination of these may be sufficient to account for Saddam’s inability to prevent Coalition capture of Baghdad *per se*. But they did not prevent Iraq from waging enough close combat, at point blank range under nominally favorable conditions, to have caused much higher Coalition casualties if Iraq’s fighters had been tactically proficient. And they did not prevent Iraq from carrying out Saddam’s threat of scorched earth or WMD use, either of which was more a result of Iraqi choices than Coalition capabilities. To explain this outcome thus requires the idiosyncrasies of Ba’athist Iraq, and an interaction effect between Coalition strengths and Iraqi weaknesses – and in particular, a synergy between advanced Coalition technology and a major skill imbalance.

This is not to say that speed was a bad idea, or that either precision or situation awareness are undesirable. Moreover, to say that with hindsight it seems unlikely that the Iraqis would have torched their oil fields or used WMD with more time is not to say

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<sup>96</sup> MHI: Memorandum for the Record, LTC C interview, 12 May 2003, CFLCC HQ, Camp Doha Kuwait; Tape 050303a1sb COL Allyn, et al. int.; Tape 050203a1io LTC Bayer, et al.; Tape 050203p1sb COL Perkins, et al. int.

this could have been known at the time. A rapid advance made sense given the credible possibility that Saddam might carry out such threats. And both precision and situation awareness were important contributors to the aggregate technological sophistication we needed to exploit the Iraqis' mistakes.

Many factors thus contributed to success. And the analysis above should not be taken as a critique of prewar planners, who operated with far less than the 20:20 hindsight available to postwar analysts.

But to say that many factors were important is not to establish that a subset were important enough to restructure the military around them. In particular, it would be a serious mistake to overestimate the contribution of technology or speed and to underestimate the importance of the skill differential and the Iraqis' role in this. Getting the relative importance of these factors wrong can lead to at least two serious dangers.

First, it could lead to a mistaken assumption that precision and situation awareness can produce OIF-like results against other opponents with better skills than the Iraqis'. Even with skilled forces of our own, this is a risky proposition. In 2003, our technology could operate at maximum effectiveness against exposed, ill-prepared opponents. Enemies who do a better job of exploiting the natural complexity of the earth's surface for cover and concealment could pose much tougher targets – as we have already seen in the performance of al Qaeda fighters in Afghanistan, and Serbian forces in Kosovo.<sup>97</sup> Our technology's performance is strongly affected by the nature of its targets, and our targets were extremely permissive in OIF. If we overlook this, we could thus exaggerate our technology's potential against better skilled enemies elsewhere.

Second, misunderstanding causation in OIF could lead to a mistaken assumption that speed can substitute for mass, and that standoff precision can substitute for close combat capability. If speed were sufficient for the OIF outcome (either alone or in conjunction with precision and networked information), and if speed and mass are antithetical, then reducing mass to enable greater speed would make sense. But if speed was *not* sufficient, and if a major skill differential was necessary for speed to produce 2003's results, then to trade speed for mass in U.S. force structure could be a dangerous bargain. Against enemies like Iraq, small, fast-moving ground forces with massive standoff firepower and excellent situation awareness may well succeed again – in fact, against such foes this could well be the optimum solution. But if future warfare pits us against better-skilled opponents, and if a skill differential played the role identified above in OIF, then a small but agile U.S. ground force could find itself unable to cope with concealed, covered enemies in numbers too great to overcome without mass of our own.

And this in turn suggests that the common use of OIF as evidence to fuel transformation proposals is often mistaken. The ineptitude of Saddam's military played an important role in the low cost of major combat operations in OIF. If we cannot guarantee such inept enemies in the future, then we must be cautious in drawing implications from this conflict for force planning – whether one thinks those implications suggest restructuring for counterinsurgency, or shifting toward standoff precision.

The relative importance of the various contributors to OIF's outcome thus matters centrally for policy – to overemphasize technology's role could lead to dangerously unsound defense planning choices. But in addition to these policy implications, the analysis above also poses some important implications for further research.

In particular, it highlights the need for a better understanding of potential opponents'

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<sup>97</sup> For detailed treatments, see the references cited in notes 75 and 76 above.

military skills - and especially, the need to predict these accurately before the fact. Campaign planners need to know, in advance, whether they will confront al Qaeda-like skills or Republican-Guard-like skills in hostile forces. Given the importance of enemy skill for U.S. standoff lethality, this difference can imply great differences in the size and nature of the friendly forces needed for any given contingency. Routine worst-case planning was never a good idea, but it is especially unsustainable given today's possibility of multiple campaigns in multiple theaters and the ensuing demands on American forces. We cannot afford to treat every potential enemy as ten-foot-tall supermen. Yet neither can we afford to underestimate an enemy and send a force too small or too lean for the job. The only proper way to make such calls is to base them on a foundation of serious scholarship on the causes and distribution of national military skill. Yet the literature on this issue is radically underdeveloped.

We must do better. And we can. OIF itself, for example, provides some suggestive possibilities for important determinants of military skill. In particular, Iraqi civil-military relations appear to have systematically undermined their ability to learn from their experience or field the kind of military that could have challenged our ability to prevail with standoff precision or mounted ground combat. Throughout his rule, Saddam Hussein faced a constant threat of violent overthrow by his own officer corps. Having come to office via coup d'état and having lived through at least eight and possibly dozens of attempts on his life in his two decades as Iraqi head of state, Saddam had to assume that at any given time his own officers could well have been plotting his assassination. Modern coup-threatened autocrats employ a variety of techniques to defend themselves against such threats, ranging from frequent rotation of commanders and purges of the officer corps to suppression of horizontal communications within the military; divided lines of command; exploitation of ethnic divisions in officer selection or unit organization; surveillance of military personnel; promotion based on political loyalty rather than military ability; or execution of suspected dissident officers.<sup>98</sup> In the process, regimes can make conspiracy by the military extremely difficult. At the same time, however, such techniques reduce systematically the military's effectiveness against foreign armies.<sup>99</sup> The Iraqis' failure to train their forces in urban warfare or provide adequate marksmanship practice are particularly suggestive here. Saddam's palaces are mainly in urban areas - his residences functioned partly as homes but largely as political symbols to impress the public with his wealth and power. Hence almost every major city in Iraq houses a palace, and much of Saddam's time was spent in urban areas. A military with ready access to the ammunition needed for live-fire training and with the skills for competent city fighting could thus pose a particular risk to Saddam; conversely, a military whose rank and file felt uncomfortable fighting in cities and whose members rarely had access to live ammunition could more readily be controlled by Saddam's praetorian guards, Ba'athist irregulars, and secret intelligence services. With personal survival as Saddam's

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<sup>98</sup> See, e.g., Samuel Huntington, *The Soldier and the State: The Theory and Politics of Civil-Military Relations* (Cambridge, MA: Harvard University Press, 1957), p.82; Amos Perlmutter and Valerie Plave Bennett, eds., *The Political Influence of the Military* (New Haven: Yale University Press, 1980), pp.205-208; Eliot Cohen, "Distant Battles: Modern War in the Third World," *International Security*, Vol.10, No.4 (Spring 1986), pp.143-171 at 168.

<sup>99</sup> For more detailed discussions, see Stephen Biddle and Robert Zirkle, "Technology, Civil-Military Relations, and Warfare in the Developing World," *Journal of Strategic Studies*, Vol. 19, No. 2 (June 1996), pp.171-212; Risa Brooks, *Political-Military Relations and the Stability of Arab Regimes* (London: IISS, 1998), Adelphi Paper No. 324. Cf. Kenneth Pollack, *The Influence of Arab Culture on Arab Military Effectiveness* (PhD dissertation, MIT, 1996); idem, *Arabs at War: Military Effectiveness, 1948-1991* (Lincoln: University of Nebraska Press, 2002).

first priority, this policy made sense for him – as it would for other autocrats in coup-threatened regimes – but it creates predictable barriers to the military skill development needed to fight American forces with any hope of success.

Of course, this is far from a sufficient theory of the determinants of skill in foreign militaries. But it does suggest an identifiable, predictable feature of a state's political organization that could assist in the identification of likely skill levels in some important states. And it suggests that the subject matter may be intellectually tractable: it should be possible to develop a plausible set of such variables that could offer meaningful purchase on states' skill potential, and to test such variables' influence against real cases in a rigorous way. Given the centrality of skill for the OIF outcome and its likely importance for the role of technology in future warfare, such an analysis is a critical national research requirement and warrants highest priority for the defense analytical community.