Trading the Saber for Stealth: Can Surveillance Technology Replace Traditional Aggressive Reconnaissance?

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Foreword

The Modular Force design will fundamentally change the way Army forces conduct reconnaissance on the future battlefield. Tactical reconnaissance organizations will replace their traditional combat capability with a surveillance capability. This raises fundamental questions about the nature of effective reconnaissance operations: Is close combat with the enemy an essential part of effective reconnaissance? Do combat formations still have to fight for information or do modern surveillance technologies change this paradigm?

This research paper seeks to answer this question through an examination of Soldier interviews collected by the Center for Army Lessons Learned following the opening months of Operation Iraqi Freedom. The study conclusively determines that the rapid tempo of modern warfare has rendered lightly armored scout units virtually ineffective in the heavy force. In addition, the fluid, unconventional nature of the enemy seriously hampers the effectiveness of aerial surveillance platforms. In OIF, most commanders had to fight for the information they needed by engaging in close ground combat with their most survivable weapons platforms.

Based on themes derived from the interviews and a review of reconnaissance experiences in North Africa in 1943, the National Training Center and Operation Desert Storm, the author proposes a theoretical framework for defining the effectiveness of differing types of reconnaissance in terms of operational tempo and battlefield density. This framework strongly suggests that Army reconnaissance units must maintain a robust combat capability if they will continue to support high-tempo offensive operations against an adaptive enemy.

The paper concludes with a series of recommendations for doctrinal and organizational changes based on the conclusions outlined above. Specifically, the author recommends that the Army abandon the notion that commanders will "see first and act first." Instead units must be prepared to fight under conditions of great uncertainty against an enemy that defies conventional templating techniques. Live and virtual simulations must adapt to support this reality. Finally, the author suggests that lightly armored scouts are inappropriate in the heavy force and should be replaced by more survivable platforms.

The Army must take this kind of look at every aspect of its operational capabilities if transformation to the Modular Force is to be both comprehensive and successful.

GORDON R. SULLIVAN
General, United States Army Retired
President

September 2005

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The whole art of war consists of getting at what lies on the other side of the hill, or in other words, what we do not know from what we do know.
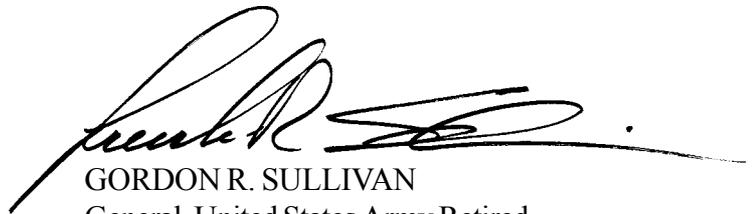
The Duke of Wellington[1]

Introduction

The Modular Force design will fundamentally change the way Army forces conduct reconnaissance on the future battlefield. Tactical reconnaissance organizations will replace their traditional combat capability with a surveillance capability. Under the Modular Force concept, dedicated tactical reconnaissance units are found at three levels of command—the battalion scout platoon, the armed reconnaissance squadron (ARS) and the battlefield surveillance brigade (BFSB). All three organizations are specifically designed and equipped to execute passive reconnaissance only—that is, they collect information by observation from a distance rather than by gaining direct contact. This significant change is founded on the idea that modern surveillance technology has enabled reconnaissance units to collect information through observation that once could only be gained by fighting. This raises a fundamental question about the nature of effective reconnaissance operations. Is close combat with the enemy an essential part of effective reconnaissance? Do combat formations still have to fight for information or do modern surveillance technologies change this paradigm?

Previous attempts to transform the military based on emerging technologies had to rely primarily on the forecasts of military theorists and the results of staged field tests and experiments rather than on real-world experience. In many cases, the tendency has been to place too much faith in the power of technology and too little in the persistence of friction on the real battlefield. Fortunately, the Army today has a great advantage that it lacked during previous periods of major reform—an abundance of contemporary battlefield experience. Since 11 September 2001 the U.S. Army has been engaged in conflicts all over the globe. These operations have provided an enormous amount of anecdotal information with which to thoroughly "field test" any new warfighting hypothesis. In military operations in both Iraq and Afghanistan, the Army has employed highly sophisticated surveillance technology and modern intelligence fusion techniques against a thinking and adaptive enemy. This enemy has ranged from traditional Cold War-style tank divisions to

amorphous terrorist networks. If this modern technology has reduced battlefield uncertainty for the tactical commander, the evidence for it should be overwhelming.

With this in mind, this paper will attempt to critically test the hypothesis emerging in the Modular Force design that the combat capability of traditional cavalry organizations can be replaced by a passive surveillance capability. This hypothesis is built on the assumption that modern surveillance technologies dramatically reduce uncertainty and render the combat forces in these organizations obsolete. The ample battlefield experience in the opening months of Operation Iraqi Freedom (OIF) provides an ideal real-world environment in which to field test this hypothesis.

Before looking at the contemporary experience of OIF, it is important to fully understand the history that shaped the current design of reconnaissance forces in today's military. Much has been written on the evolution of cavalry organizations and doctrine and need not be repeated here. Instead, this review will focus on three critical periods that shaped the design of present day reconnaissance forces—Operation Torch in North Africa, the National Training Center (NTC, at Fort Irwin, California) in the 1980s and '90s and Operation Desert Storm.

Operation Torch, North Africa

As the U.S. Army endured the major transformation from a horse- and foot-bound force to a mechanized one in the 1920s and 1930s, its cavalry formations developed a kind of identity crisis. For centuries, cavalry had been a collection of missions built around a platform—the horse. With that platform no longer viable, what would become of the collection of missions the horse had fulfilled? Emerging doctrine in the prewar period envisioned mechanized and motorized cavalry as primarily a reconnaissance force. Other traditional horse cavalry missions, such as delay, exploit and attack, were left to the other branches and the emerging armored corps. These mechanized reconnaissance forces were designed to acquire information primarily through stealth. Fighting for information was not considered a core cavalry task. In fact, tanks were eliminated from the prewar mechanized cavalry squadrons because they were considered too large, noisy and limited in their operating range.[2]

In 1933, the Army fielded the first fully mechanized cavalry organization—the First Cavalry Regiment.[3] This organization consisted primarily of lightly armored cars equipped with submachine guns and rifles. Like the emerging armed reconnaissance squadron of the Modular Force design, the armored car units of the First Cavalry Regiment were specifically designed not to fight. The publication of Field Manual 2-10, *Cavalry Field Manual,* Volume 2*, Mechanized Cavalry* (1941)[4] reinforced this view by emphasizing the importance of stealthy mounted and dismounted reconnaissance and the necessity of avoiding enemy contact.[5] It was upon this doctrinal basis that the first mechanized cavalry formations marched to war in early 1943 equipped with jeeps and armored cars.

The 81st Armored Reconnaissance Battalion and the 91st Cavalry Reconnaissance Squadron were among the first to see combat in Operation Torch in North Africa. While both organizations had been trained and equipped to conduct only passive reconnaissance missions, both repeatedly found themselves in intense direct fire fights with German forces. Stealthy infiltration became unfeasible in open terrain against a well-positioned enemy. Key terrain that provided effective observation had to be fought for or defended once seized. Additionally, commanders desperately needed a force capable of providing them the early warning that traditional cavalry units had performed in the previous century. As a result, both the 81st and 91st spent much more time fighting for information and conducting traditional security operations than either their training or equipment prepared them for.

The greatest lesson of the North Africa campaign was that direct combat was virtually unavoidable if a reconnaissance force was to be effective at all. Time and again, field commanders were forced by the tactical situation to employ these lightly armored reconnaissance organizations in situations that required combat with heavy German forces. A second key lesson learned was that reconnaissance troops could not survive without armor support—in this case the M3 Stuart light tank. The 81st Armored Reconnaissance Battalion discovered this shortfall and quickly attached tank platoons to each of its cavalry troops. Compiling his observation of the North Africa campaign, Major General Charles Scott, commander of the Armor Replacement Center, commented in the *Cavalry Journal* in November 1942,

> In this day and age, long distance reconnaissance must be organized to fight in execution of its mission, to fight for time to send information in, and to fight for time for the main body to properly utilize the information sent in. . . . Reconnaissance capable of only observation is not worth the road space it takes.[6]

Following World War II, the Army compiled its key lessons learned from cavalry operations into General Board Report Study Number 49, "Mechanized Cavalry Units," published in 1945. This report reaffirmed the notion that effective reconnaissance almost always required fighting—except in those rare cases where the commander had the time to conduct an effective stealthy infiltration operation.[7]

The Goldsmith Studies

In 1987 and 1996, Martin Goldsmith of the RAND Corporation conducted two detailed studies of reconnaissance operations at the National Training Center on behalf of the U.S. Army. The studies had a profound influence on the evolution of reconnaissance doctrine, organization and equipment in the 1990s. The methodology for both studies was to examine the outcomes of simulated battles at the NTC and attempt to correlate those outcomes with the success or failure of the reconnaissance operation that preceded it. Information for the study came from the assessments of observer-controllers collected through a detailed questionnaire and from the comments of unit participants.

Despite the nine-year gap, both studies observed essentially the same trends in reconnaissance. The first study, entitled *Applying the National Training Center Experience: Tactical Reconnaissance,* established "a strong correlation between successful reconnaissance and successful offensive operations." In fact, this correlation was so strong that Goldsmith argued that "beginning an attack . . . without appropriate intelligence is apt to lead to failure."[8]

Goldsmith also concluded that stealth was an essential factor in effective reconnaissance.

The 1987 study noted that the opposing forces stationed at the NTC enjoyed considerable success in reconnaissance by employing wheeled scouts, essentially visually modified HMMWVs (high-mobility multipurpose wheeled vehicles), instead of the larger, tracked BMPs (*Bronevaya Maschina Piekhota*, the Soviet family of infantry fighting vehicles) based on an M113 (light armored tracked vehicle) chassis. Since these wheeled platforms consistently proved superior to the tracked platforms employed by BLUFOR (Blue Forces) scouts, the study suggested that the HWMMV may be a better reconnaissance platform. Shortly after this report, the Army made the decision to eliminate armored vehicles from battalion scout platoons and rely on a pure HWMMV configuration. This was due in large part to the recommendation of the RAND study.[9] This decision, although fully supported by the extensive empirical evidence gathered from observing force-on-force battles at the NTC, was in direct contrast to the lessons learned from the North Africa campaign where commanders found that effective scouting through stealth was a rare exception and that the best information had to be gained through combat.

Nine years later, in 1996, Martin Goldsmith again looked at the reconnaissance issue at the NTC in a subsequent study entitled *Battalion Reconnaissance Operations at the National Training Center*. This study confirmed that commanders still failed to develop adequate intelligence on the enemy about 75 percent of the time and that this failure was a major determining cause of overall mission failure. This conclusion was virtually identical to the data gathered a decade before. Since both Bradley fighting vehicle- and HMMWV-based scout formations were in the force at the time, Goldsmith compared them for survivability and effectiveness. Surprisingly, the study found no significant difference between the survivability of the Bradley cavalry fighting vehicle and the HMMWV as a scout platform. Goldsmith theorized that this was a balanced offset between the improved stealth of the HMMWV and the survivability of the Bradley.[10] Furthermore, all the data confirmed that brigade commanders suffered from the lack of a dedicated reconnaissance force and that battalion commanders too often failed to properly employ their scouts.[11] The findings and recommendations of this second study led to the addition of a reconnaissance block of instruction at the Battalion Pre-Command Course, the creation of the Scout Platoon Leader's Course at Fort Knox, Kentucky, and the eventual creation of the brigade reconnaissance troops in every heavy brigade.

Kuwait, 1991

Because Operation Desert Storm saw the first large-scale employment of U.S. heavy formations since the Korean War, it provided an excellent test case for many new warfighting concepts that emerged during the Cold War but were, fortunately, never fully tested in the long-awaited conflict with the Soviet Union. One of the most detailed examinations of the Army's performance in Operation Desert Storm is found in the six-volume report entitled *Operation Desert Storm Lessons Learned*. Often referred to as the "Tait Report" in honor of its major author, this extensive examination of the campaign highlights issues and makes recommendations on virtually every aspect of military operations. Volume four deals specifically with the issue of ground reconnaissance .

First, the Tait Report concluded that the divisional cavalry organizations at the time lacked the combat power to conduct their traditional roles of reconnaissance, security and economy of force. Because tanks were not organic to the squadrons, many commanders were forced to task organize tank companies from the maneuver brigades to provide the division's primary reconnaissance asset with the resources needed to fight for information and survive on the battlefield.[12]

Second, the Tait Report also highlighted the acute limitations of using HMMWV-mounted scouts in a reconnaissance role due to their limited survivability. While this concept had repeatedly proved successful on the laser battlefield of the National Training Center, the Tait Report concluded that unit commanders typically chose to pull their wheeled scouts from the front and place them on other less threatening missions rather than risk losing them.

The experience in Desert Storm reinforced the lesson of the North Africa campaign—that effective reconnaissance must often include fighting. Whereas commanders in the deserts of North Africa in 1943 had suffered heavy casualties employing light reconnaissance formations to fight for information, commanders in the deserts of Kuwait in 1991 simply chose not to use them.

Carl von Clausewitz argued that because human passions and the element of chance were so deeply entwined in the phenomenon of warfare, "real wars" would always look very different from "war on paper."[13] In other words, the real conditions of the battlefield will always be more complicated, confusing and bloody than our theoretical examination would lead us to initially conclude. If Clausewitz is correct, then we should expect to see a natural tension between the views of theorists who cite the capabilities of new, emerging weapon systems and the views of veterans who cite the persistence of the hard human realities of combat. The tension predicted by Clausewitz correctly characterizes the debate over reconnaissance roles and capabilities over the past 70 years. Since World War II, theorists have argued that passive surveillance by lightly armed or unarmed platforms can collect critical information through stealth. They have defended their positions by citing the capabilities of new weapon systems and the results from peacetime training exercises

and constructive simulations. The evidence collected from North Africa, Kuwait and now Iraq, however, paints a very different picture. After-action reviews from these conflicts consistently depict the situation as too fluid or too rapid to allow the proper employment of stealthy means of information collection.

A Break from the Past?

Many military theorists, particularly proponents of the emerging concept of Net-Centric Warfare, suggest that emerging information technologies have allowed the modern military to break from the lessons of the past and exploit opportunities that were incomprehensible only 10 years ago. A thorough examination of this topic then requires a detailed look at how commanders employed reconnaissance on the contemporary battlefield where the full suite of modern technology was available. For this reason, the opening months of Operation Iraqi Freedom serve as an ideal historical laboratory in which to test a new reconnaissance hypothesis. The improvements in surveillance technology between Operation Desert Storm and Operation Iraqi Freedom have been substantial. Units deployed to Iraq with tools unimaginable to their predecessors of a decade ago. Additionally, the rapid, decisive exploitation conducted by V Corps in Operation Iraqi Freedom is exactly the type of conflict the heavy brigade combat teams (BCTs) of the Modular Force are optimized to fight. If emerging surveillance technology will eventually allow us to break from the past, as so many have argued, the first indications of this break should appear in the experience of tactical units in the opening months of Operation Iraqi Freedom.

Operation Iraqi Freedom Reconnaissance Operations

The [Intelligence Battlefield Operating System] collapsed upon itself. Intelligence was not there. Every battle they fought was a movement to contact. Nobody had a decent [situation template] of what they were fighting. As a result of that he could not use the [HMMWV] scouts because he could not screen in front of a moving force.

Lieutenant Colonel Jeffrey R. Sanderson[14]

In the weeks following the fall of Baghdad, Army Chief of Staff General Eric K. Shinseki commissioned a team of researchers headed by Brigadier General Mark E. O'Neill to conduct a thorough review of the U.S. Army's performance in the opening phase of Operation Iraqi Freedom. The focus of this review was to immediately capture lessons learned from the fight that could quickly be disseminated out to the force. The Operation Iraqi Freedom Study Group (OIF-SG), composed of about 90 officers, Soldiers and civilians, deployed to the Iraqi theater of operations and collected data on the operation from 7 May to 15 June 2003. During this period the OIF-SG collected more than 119,000 documents, ranging from unit after-action reports to operations orders. In addition, they conducted 2,214 interviews with participants in the operation. These participants ranged

from private to lieutenant general and reflected every echelon of command from squad up to the Central Command staff. More than 300 of these interviews spoke directly to the issue of tactical reconnaissance operations. Almost every tactical commander from battalion to theater level commented on the challenges and successes of his reconnaissance operations. Six major themes emerged from these interviews and are detailed below. Collectively they demonstrate that light ground reconnaissance and aerial surveillance techniques have significant limitations on the real battlefield that rarely emerge in training situations. The lessons from OIF strongly suggest that effective reconnaissance will continue to require meeting the enemy on the ground and fighting for information. This is a task for which the Modular Force is dangerously unprepared.

Theme 1: Tempo drives reconnaissance. The most significant theme that emerges from virtually every interview dealt with the issue of tempo. The strategic situation demanded a rapid advance to Baghdad followed by a quick strike against the city and the regime. This was necessary to protect critical natural resources, preempt use of chemical or nuclear weapons, and keep the enemy off balance by advancing faster than he could react. Recognizing this reality, operational planners at Coalition Land Forces Component Command (CFLCC) planned the deepest, most rapid advance of a mechanized force in modern history. The focus of V Corps from the start of the campaign was to deliver the 3d Infantry Division as rapidly as possible to the Karbala Gap, where it would destroy Iraq's Medina Division and begin the encirclement of Baghdad. This focus generated an insatiable demand for tempo that far exceeded anything the Army had trained for in simulations or at the National Training Center.

The tempo stressed virtually every battlefield operating system to the breaking point. Since the tempo was built into the plan and driven by operational and strategic requirements, commanders at the tactical level were unable to slow it down. The CFLCC set the "cruise control" and everyone in the formation was obligated to keep up. The concept of "see first, understand first, act first and finish decisively" often quoted in Army transformation documents implies that a tactical commander has the flexibility to modulate his unit's tempo and maneuver his formation after he has a good understanding of the enemy. In fact, the exact opposite occurred. The operational tempo forced commanders to act immediately with little or no information and adjust the plan as the situation developed.

Theme 2: The movement to contact is the most common type of offense. The rapid tempo led Lieutenant General William S. Wallace, the V Corps commander, to conclude that his entire formation, from platoon to corps, was in a movement to contact from the time they crossed the berm in Kuwait until the fall of Baghdad. "Every fight . . . every fight . . . at platoon, company, battalion, and probably at brigade level . . . has been a movement to contact."[15]

This comment is echoed in interviews with three brigade commanders and Brigadier General Benjamin C. Freakley, assistant division commander of the 101st Airborne Division

(Air Assault).[16] Units rarely had any real sense of what enemy formations were immediately in front of them because they were simply unable to template the enemy at the level of detail required to plan a deliberate or even a hasty attack. In these cases where uncertainty abounds, Army doctrine stresses that the unit should conduct a detailed reconnaissance of the enemy on the objective and plan a deliberate operation to defeat that enemy. This is exactly what units are trained to do in brigade-level attacks at the National Training Center. Unfortunately, for the reasons mentioned above, no brigade commander could afford to slow down long enough to carry out this type of reconnaissance.

Theme 3: Adaptive enemies often do not fit doctrinal templates. Colonel David Perkins, commander of the 2d BCT, 3d Infantry Division, called it "iconology."[17] BG Freakley from the 101st mentioned the same idea, more pejoratively calling it "blobology."[18] They were both referring to the tendency of intelligence officers to draw a red icon on a map and assume that they had effectively templated the enemy.

In the context of U.S. tactical doctrine, a red icon implies that at the designated location, one can find a cohesive, uniquely equipped enemy formation of a particular size and composition that is executing a specific tactical task. Operation Iraqi Freedom revealed that this rather simplistic view of the enemy, reinforced through years of training against symmetrical adversaries like the combat training centers' opposing forces, is fraught with fallacy.

In Operation Iraqi Freedom, S2s (staff intelligence officers) quickly discovered that the size and the quality of equipment of a particular enemy unit told them little about the severity of resistance they might encounter. Time and again, large conventional formations would crumble in the face of American assault while small bands of Iraqi irregulars offered intensely fierce resistance. In this context, an icon was essentially meaningless because it told a commander little about what type of enemy contact he could expect or what the enemy's intention was. Despite the considerable effort and resources devoted to reconnaissance, the enemy simply would not fit any easy template. Lieutenant Colonel Natalie Lee, G2 (intelligence officer) for 4th Infantry Division, summed up the frustration of many in the intelligence community when she declared in her interview that "there are no red icons!"[19] Since the size and composition of the enemy said little about his capability or his intent, commanders found that the type of detailed information that often flowed down from satellite imagery, unmanned aerial vehicle (UAV) surveillance or passive reconnaissance efforts was essentially meaningless. To understand the enemy's intent, they needed human intelligence (HUMINT).

Theme 4: Commanders require human intelligence more than imagery. Many key leaders commented on the importance of human intelligence. The special operations forces teams who worked in support of both the 3d Infantry and 101st Airborne divisions were absolutely vital in this capacity. Often the most useful information came from captured Iraqi prisoners or from Iraqi citizens. Colonel William Grimsley, commander of the 1st

Brigade Combat Team, 3d Infantry Division described the difficulty he and his S2 were having in templating the Medina and Adnan divisions until they captured a large contingent of enemy prisoners of war from those units. What they discovered was that both divisions had spread out their forces from Baghdad to An Najaf rather then deploying them in any strict doctrinal manner.[20] The reasons behind this bizarre defensive strategy did not become apparent until soldiers were captured and interrogated. No amount of satellite imagery or UAV feed could have provided the critical insights offered by a handful of captured soldiers. Because the enemy was not adhering to any doctrine, it was virtually impossible to assess his intent and predict his future actions based on where his forces were arrayed. This type of predictive intelligence could be obtained only by meeting the enemy face to face.

Theme 5: Most useful intelligence is bottom-up. Because of the "iconology" fallacy and the consistent failure of surveillance assets to predict enemy action, many interviewees, including many of the battalion commanders, believed that the vast majority of useful intelligence came from within their own formation. COL Perkins commented, "We got our intel from the lead tank."[21] Lieutenant Colonel Terry Ferrell, commander of the division cavalry squadron for the 3d Infantry Division, commented that higher-level G2s provided little intelligence to the squadron. The vast majority of intelligence he used was generated by his own formation. In fact, LTC Ferrell grew increasingly frustrated with the inaccurate reports generated by both the Joint Surveillance and Target Attack Radar System (JSTARS) and the corps UAV and felt the division would have been better served if they had shut off the feed from these sources because of the number of false reports. "JSTARS had my squadron chasing camels on two different occasions."[22] This sentiment is echoed over and over again by other battalion commanders.

Major General James Marks, the CFLCC intelligence officer, observed what he called a "break in the system" somewhere between the battalion and division levels. Information moved relatively easily between CFLCC, V Corps and the divisions because of the large bandwidth capabilities of these headquarters. However, at the brigade and battalion level this information "bottle-necked" down to only what could be transmitted over a voice radio net. MG Marks summed up this sentiment with the comment, "At the battalion level, it is a bump in the night."[23]

The largest conventional tank battle of the war occurred on the morning of 3 April 2003 when elements of three Iraqi brigades consisting of no fewer than 100 armored vehicles and up to 10,000 soldiers converged on 3d Battalion, 69th Armor, as they guarded a critical bridge crossing the Euphrates River at Objective Peach. This type of large conventional force is the ideal formation that the extensive surveillance network operating in Iraq should have been able to detect. Lieutenant Colonel Earnest "Rock" Marcone, commander of 3-69 Armor, claims that "the Iraqi Republican Guard did nothing special to conceal their intentions or their movements. They attacked en masse using

tactics that are more recognizable with the Soviet army of World War II."[24] LTC Marcone reported that, despite the large conventional force moving against him, "we got nothing until they slammed into us."[25] In fact, the battalion did not receive a single piece of intelligence from their higher headquarters to indicate that such a large attack was imminent. The commander had terrible situational awareness that night in spite of the large array of airborne reconnaissance platforms that were supposedly watching his front. With almost no early warning, 3-69 Armor was able to successfully fight off the attack due to the unit's quality training and superior armor protection and to the disjointed nature of the Iraqi attack.

While bandwidth limitations certainly plagued the process of intelligence dissemination, the problem was deeper than a simple limitation of technology. Battalion commanders complained that the information from higher headquarters was the wrong kind of data because it was too often of the "iconology" variety rather than the down-to-earth human information that the special operations forces or their own scouts and combat units could generate. Human information told them the enemy's intent in ways that satellite imagery never could.

Theme 6: Lightly armored scouts cannot support high-tempo operations. The three brigade combat teams of the 3d Infantry Division were each equipped with brigade reconnaissance troops consisting of 10 HMMWV-mounted scouts equipped with the long-range advanced scout surveillance system (LRASS) and a combination of Mark-19 grenade launchers and .50-caliber machine guns. Operation Iraqi Freedom was the first test of the new brigade reconnaissance assets in combat since their creation following the 1996 Goldsmith reconnaissance study. Likewise, each battalion task force included a similarly equipped scout platoon of six HMMWVs.

Perhaps the greatest success of this new design was the LRASS optical system. Numerous interviews spoke of the incredible capability of the new sight to acquire and classify enemy targets at extreme distances. The greatest praise came from Colonel Daniel Allyn, commander of the 3d Brigade Combat Team, 3d Infantry Division, who related an incident near Karbala where his brigade reconnaissance troop was able to acquire precise 10-digit grids of enemy vehicles and dismounts with their LRASS at a range of 3,600 meters and then pass that information directly to his artillery battalion for a first-round hit.[26]

Despite the successes of the LRASS optical system, the vulnerability of the lightly armored scouts proved to be a significant limitation. Shortly after crossing into Iraq, most of the brigade reconnaissance troops transitioned from their traditional role of forward reconnaissance to conducting route security or convoy escort for the unit trains. The same thing happened with the task force scout platoons. In a few cases, units attempted to equip their scouts with M113s from their maintenance sections to afford them some measure of survivability. In the majority of cases, commanders simply stopped using their reconnaissance troops for reconnaissance.

Lieutenant Colonel Jeffrey Sanderson, commander of 2d Battalion, 69th Armor, could not employ his HMMWV scouts because he saw that they were incapable of screening in front of a moving force.[27] Lieutenant Colonel Scott Rutter, commander of 2d Battalion, 7th Infantry, chose to keep his scouts only two to three kilometers from his lead forces to provide them some degree of protection.[28] Lieutenant Colonel Stephen Twitty, commander of 3d Battalion, 15th Infantry, used his scout platoon as convoy escort and employed M2 Bradley infantry fighting vehicles from his line companies to conduct reconnaissance for the battalion. He strongly recommended, based on his inability to employ the HMMWVs correctly, that scout platoons in the future should be equipped with M3 Bradley cavalry fighting vehicles rather than HMMWVs.[29] COL Perkins pulled his brigade reconnaissance troop from the reconnaissance mission when the rocket-propelled grenade (RPG) threat became too intense.[30]

The only unit in 3d Infantry Division that had scouts operating in armored vehicles was the division cavalry squadron, 3d Squadron, 7th Cavalry. However, during a tough fight against incessant RPG attacks, LTC Ferrell found the situation too dangerous to reconnoiter even with the medium armor on his M3 cavalry fighting vehicles. To solve this dilemma, he placed his tanks forward of the M3s and then ordered his scouts to ride on the tanks in place of the tank loaders.[31]

Light scout units were created in the 1990s based largely on the NTC experience and the findings of the 1987 and 1996 Goldsmith studies. Because the tempo and the terrain of the NTC afford commanders the opportunity to employ stealth effectively to infiltrate through enemy security areas, passive reconnaissance by lightly armored vehicles has proven successful in this environment. Unfortunately, the long time periods so essential to effective infiltration were not available in Operation Iraqi Freedom, and the light scout became incapable of operating beyond immediate supporting distance of heavy forces. Because of the superb range and effectiveness of the LRASS optics, some scout units were able to compensate for this limitation by seeing further. In restrictive terrain, the extended range of the LRASS was less useful and the need to stay close to the line companies became more acute. As a result, light scouts were rarely effective in restrictive terrain.

When scout platoons were employed in traditional reconnaissance roles, they frequently made direct fire contact with the enemy and had to call upon heavy forces to help them. For example, the scout platoon for 3-69 Armor was conducting a route reconnaissance in the vicinity of Objective Peach on 3 April when it was ambushed by unconventional forces equipped with submachine guns and RPGs. The platoon would likely have been overrun if a section of tanks and Bradleys from 3-7 Cavalry that was also in the area had not come to its rescue.[32]

Captain Scott Woodward, commander of the brigade reconnaissance troop for 2d Brigade Combat Team, 3d Infantry Division, observed that every time his unit conducted

a screen, it had to be supported with firepower from more survivable platforms.[33] This, along with many similar anecdotes, reinforced the idea that light scouts needed to operate within the protective supporting range of heavy armor forces. This situation is reminiscent of the mechanized cavalry squadrons that emerged in the 1930s equipped with armored cars and jeeps. The experience of North Africa proved that effective reconnaissance almost always involved fighting and that light scouts had to have some degree of survivability or the support of heavy forces to remain effective.

Building a Reconnaissance Model

The emerging themes from OIF support several broad conclusions about the nature of reconnaissance operations on the modern battlefield:

1. The operational tempo of the battlefield is the primary determining variable on a commander's decision to employ passive reconnaissance or to fight for information. In Operation Iraqi Freedom, as in Operation Desert Storm before it, the tempo was sufficiently fast to preclude the effective use of passive reconnaissance in the majority of cases. The high tempo forced lightly armored scouts to move rapidly to stay ahead of the main body. The required speed dramatically reduced the ability to employ stealthy infiltration techniques while scouting.

2. Without the benefit of stealth, lightly armored scout teams were at great risk. For this reason, commanders were unlikely to employ lightly armored scouts if they believed they would be operating within the maximum effective range of enemy direct-fire assets. Commanders chose not to use their scouts rather than run the risk of losing them on a real battlefield.

3. Because peacetime training exercises typically operate at much lower tempo and casualties are much more acceptable, stealthy reconnaissance is both feasible and effective. For this reason, Army studies that base their conclusions on the results of training exercises will invariably argue that lightly armored scouts are a practical and essential method of reconnaissance.

4. Intelligent and adaptive enemies will not allow themselves to become victims of American precision weaponry. For every advance made in precision strike capability, the enemy will find new ways to blend into the surrounding environment to avoid detection. As this process makes it more difficult to distinguish the enemy from its environment, the idea of conducting reconnaissance through passive surveillance becomes more difficult as well.

These emergent themes and conclusions suggest a general theoretical framework for better understanding the effectiveness of different types of reconnaissance on the battlefield. The research indicates that the choice of which reconnaissance method is most effective depends primarily on two major variables—operational tempo and battlefield density.
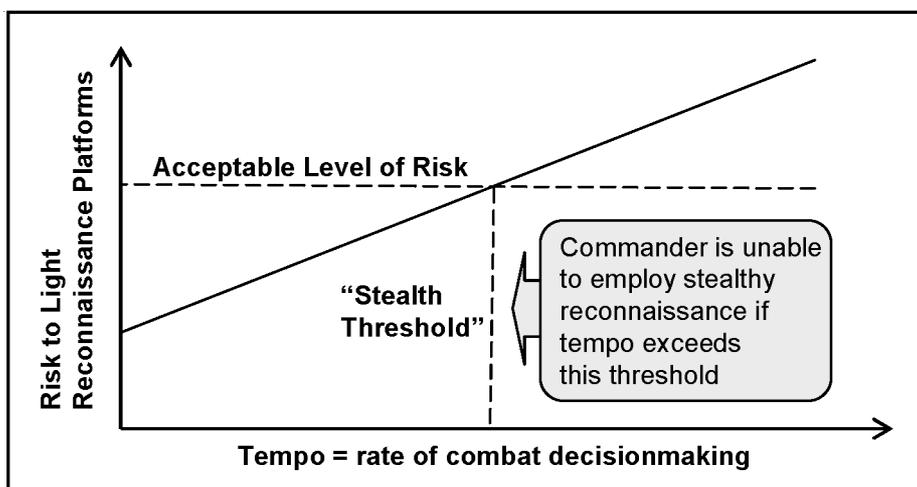
Operational Tempo

Field Manual 3-0, *Operations,* defines tempo as "the rate of military action."[34] A more specific definition of this might be "the rate at which a commander must solve tactical problems." The solving of each separate and distinct tactical problem requires the commander to gather information about the enemy, the terrain and his own force. Under ideal circumstances, the commander would then need to mount a new reconnaissance effort for each successive tactical problem. It follows then, that the commander's appetite for reconnaissance information is directly proportional to the tempo of operations. Not only is the volume of required information increased by a rising tempo, but the rate at which reconnaissance assets must acquire, assess and transmit that information to the main body increases as well. For these reasons, the operational tempo is an enormously important variable in determining the most effective method and means for conducting reconnaissance.

The more restricted definition offered above allows for an easy comparison of the tempo of operations in various conflicts—real, simulated or constructive. For example, during the typical "high-intensity" rotation at the NTC, battalion and brigade commanders are required to solve a new tactical problem approximately every 48 hours. During the offensive maneuver portion of Operation Iraqi Freedom, commanders found themselves dealing with new and complex tactical problems on the order of every eight to 12 hours. This is a four- to six-fold increase in tempo over anything encountered in even the most elaborate training facilities.

In the training environment, a battalion or brigade scout may take three to five hours of darkness to infiltrate forward of the brigade and establish a position overwatching some critical point on the battlefield. If this time were reduced by a factor of six, the scout would have to complete his infiltration in less than 30 minutes. The Goldsmith study in 1996 demonstrated that when light scouts at the NTC tried to infiltrate too quickly, they were almost always destroyed. Clearly, under these circumstances, trying to advance by stealth substantially increases the risk.

As figure 1 graphically demonstrates, if the risk of compromise increases with increasing tempo, the commander will eventually arrive at a dilemma. He must choose one of three options: (1) reduce his tempo of operations, (2) raise his acceptable level of risk and accept higher casualties among his light reconnaissance assets, or (3) find another way to conduct reconnaissance.

The first option is not feasible. Despite the Army adage to "see first" and then "act decisively," tactical commanders are bound by strategic and operational imperatives and rarely have the flexibility to reduce their tempo of their own accord. The second option, to raise the risk level, was the approach tried in Operation Torch in North Africa when light reconnaissance units suffered enormous casualties at the hands of dug-in German panzers. Since Operation Desert Storm, most American commanders have chosen the third option. Faced with an unacceptably high risk level, commanders have elected to not

Figure 1. The relationship between tempo and risk to light reconnaissance

use their scouts rather than risk losing them. The result is that tactical maneuver formations now have a "stealth threshold," a speed limit beyond which their light reconnaissance cannot operate. If the tempo of operations exceeds this threshold, the deliberate attack so common in training exercises becomes impossible and units are forced to conduct a continuous movement to contact leading with their most survivable combat systems.

Some will argue that emerging UAV and satellite technology will change this paradigm because an aerial surveillance platform does not suffer under the same "speed limit" as a ground reconnaissance vehicle. The experience in Operation Iraqi Freedom has demonstrated, however, that operational tempo is only half of the problem.
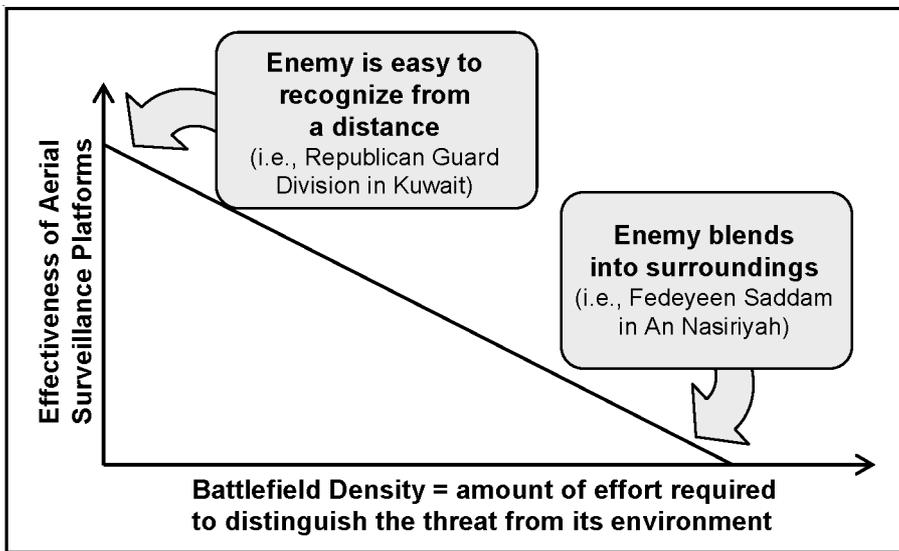
Battlefield Density

The second factor that appears to play a major role in the effectiveness of reconnaissance operations can best be described as "battlefield density." Put succinctly, battlefield density is a measure of the amount of energy a reconnaissance force must apply to distinguish a threat from its surrounding environment. This variable is really the combined effect of two battlefield conditions, one based on the terrain and the other on the enemy.

The classification of terrain as "dense" or "complex" is a familiar idea that enjoys common usage in military doctrine and contemporary writing. We recognize cities or jungles as "dense" terrain and the plains of Europe or the deserts of the Middle East as "open." This is really just a measure of the average range of visibility at any particular point on the ground. In dense terrain such as a city or a jungle, where visibility can be less than 100 meters, a reconnaissance asset must expend inordinate resources to identify the threat. Conversely, in the open deserts of Southern Iraq or California, where intervisibility often exceeds 20 kilometers, identification ranges are often limited only by the technical capabilities of the reconnaissance platform.

Terrain, however, is only a part of the overall density equation. The composition and capability of the enemy force also play significant roles in this calculation. In situations where the enemy force is equipped with standard military vehicles, wears distinctive uniforms and operates according to a coherent doctrine, less energy is required to determine his location and disposition than in a situation where the enemy wears civilian clothes, fights from commercial vehicles and operates in decentralized roving bands.
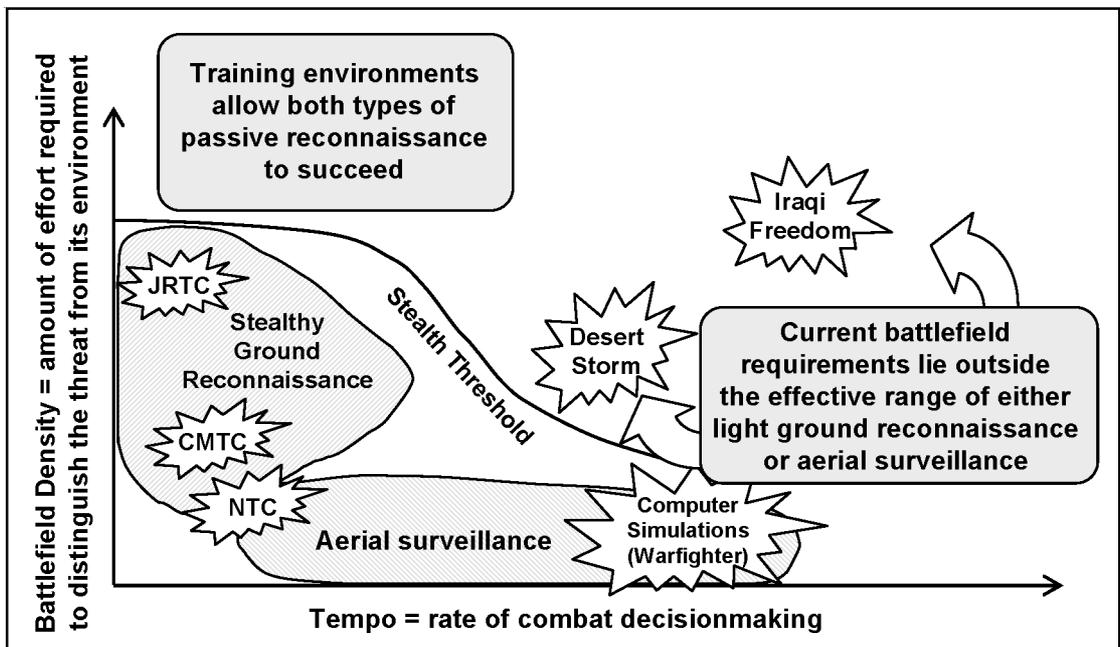
These two factors—the density of the terrain and the distinctness of the enemy force—combine on every battlefield to affect the nature and conduct of military operations. Known collectively in this model as "battlefield density," they have enormous influence on the effectiveness of reconnaissance operations. Figure 2 graphically depicts the declining effectiveness of aerial surveillance as battlefield density increases.

Figure 2. The relationship between battlefield density and the effectiveness of aerial surveillance platforms

A Complete Model

An adequate reconnaissance model should combine the critical variables of tempo and density. Placing both variables on the same chart in figure 3 allows for a comprehensive description of the reconnaissance problem. In situations where the operational tempo is low, stealthy ground reconnaissance can prove effective, even when the enemy is difficult to find. Given a week to prepare, a proficient dismounted scout team could infiltrate and establish a good template of enemy positions in even the most dense of terrain. Likewise, in situations where the operational tempo is high but the density is low, aerial surveillance is effective. For example, a UAV would be a great asset to an armor formation advancing rapidly across open desert in search of an enemy tank division. The problem arises when

**Figure 3. The combined effects of operational tempo
and battlefield density on reconnaissance operations**

both variables, density and tempo, reach the high end of the spectrum. In that case, the tempo prevents the use of light reconnaissance and density precludes effective use of aerial surveillance. Unfortunately, this has been the prevailing condition of the last two major military conflicts.

As precision-guided munitions force more of our enemies to seek a virtual sanctuary from our observation, we can expect battlefield density to continue to increase. As our ability to rapidly sustain maneuver formations over long distances increases, we should also expect a demand for ever greater tempo. This is the environment in which we have fought and will continue to fight wars of the future. Unfortunately, the live and constructive training environments in which we train and test our forces are very different. This explains the radical difference between the recommendations of a study based on training results like the Goldsmith studies and one based on combat reports like the Tait Report.

Reconnaissance Experience at the Combat Training Centers

The operational environment of the combat training centers falls at the low end of the tempo spectrum. Tactical commanders at the NTC generally have 48 hours to reconstitute their force, conduct abbreviated planning, develop information through reconnaissance and execute their tactical plan. Because of the extended time for planning and reconnaissance, scouts are able to conduct deliberate infiltration operations utilizing stealth and moving at rates often less than five kilometers per hour.

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Additionally, the battlefield density at the NTC is comparatively low. Intervisibility ranges typically exceed 10 kilometers, and the terrain is devoid of vegetation or man-made objects that would otherwise clutter the battlefield. The enemy also fights as a typical nation-state modern military with distinct uniforms and vehicles and a coherent doctrine that make it readily distinguishable from a distance. In our model the environment of the National Training Center lies at the low end of both the density and tempo spectrums. The environments at the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana, and the Combined Maneuver Training Center (CMTC) at Hohenfels, Germany, are only slightly different.

Computer Simulations

Most force developers recognize the limitations of the NTC and agree that developing a force based exclusively on experience from the combat training centers is fraught with danger. As a result, much of the data to support new concepts of reconnaissance is derived from a combination of training center trends and the results of computer simulations. The 10 different Army battle labs scattered throughout the force routinely conduct these types of simulation exercises to test new warfighting concepts. The advantage of a computer simulation is that it allows testing of concepts at the sustained, high-tempo rate that would be difficult to simulate in a real environment. Often these experiments, such as Millennium Challenge in 2002, found great value in the power of aerial surveillance platforms like the UAV. Because they operate above the battlefield, UAVs can continue to stay ahead of fast moving armor formations where ground scouts would be quickly bypassed.

The fallacy in many of these computer simulations goes back to the concept COL Perkins referred to as iconology—the assumption that the threat is a cohesive collection of identifiable weapon platforms employed in a doctrinal manner. In the world of iconology, gaining visual observation of the enemy tells the observer a great deal about his capability and his intent. UAVs and other aerial surveillance platforms excel in this world. In my own personal experience during a Warfighter exercise with the 2d Infantry Division, I discovered that flying a scout helicopter over a large swath of mountainous Korean terrain yielded an immense amount of data about the enemy in that terrain, because the aerial scout could "see" all the icons. My personal knowledge of the terrain, however, suggested that this area was all but impenetrable to aerial surveillance. Because of the way computer simulations are built, the enemy is relatively easy to detect once an observer establishes a direct line of sight. Battlefield density in the virtual world of the computer simulation is, therefore, relatively low. This explains why many advocates of modern surveillance technologies are so optimistic about their capabilities. Computer models have taught that as long as a UAV or a satellite is looking at the terrain, the enemy icons will be visible and the enemy intent will be clearly understood. The theory that commanders will one day be able to "develop the situation out of contact" is founded on these simulations.

Operation Desert Storm

Lieutenant General John J. Yeosock, commander of Third Army in Operation Desert Storm, noted that the reconnaissance line advanced about five kilometers an hour in the march across Kuwait.[35] While this may seem slow, it added up to a daily advance of almost 100 kilometers, far exceeding any previous operation in history. For this reason, most units found it difficult to continue to infiltrate their scouts forward of the advancing armor formations. This was particularly true in areas where the density of the terrain prevented the scouts from easily locating the enemy at the extreme range of their optical systems. Based on the findings of the Tait Report, it appears that reconnaissance forces in Desert Storm operated right along the edge of a "stealth threshold" where passive reconnaissance forces could effectively operate only in areas where the enemy was reasonably easy to distinguish from his environment. If those conditions did not exist, commanders pulled their scouts and fought for intelligence using heavy maneuver forces.

Operation Iraqi Freedom

The sustained rate of advance in Iraq in 2003 ranged from 25 to 30 kilometers per hour. A five-fold increase over Operation Desert Storm, this reflected the significantly higher tempo of the operation. Additionally, the battlefield density throughout Operation Iraqi Freedom was dramatically different. In Kuwait in 1991, U.S. forces encountered uniquely equipped conventional forces of the Iraqi Army in the generally open terrain of southern Iraq. In these conditions, it was relatively easy to distinguish a threat from its environment. In Operation Iraq Freedom, most of these conventional forces crumbled quickly and a new unconventional threat emerged: enemy combatants dressed in civilian clothes and abandoned their military vehicles for "technicals"—civilian trucks and cars armed with explosives or heavy weapons. Because these technicals were virtually indistinguishable from the vehicles of the civilian population, they were almost impossible to detect through observation alone. In Operation Desert Storm, many engagements between Iraqi and American forces took place at ranges beyond two kilometers. In Operation Iraqi Freedom, technical vehicles frequently approached within 100 meters of American forces before it became apparent that they posed a threat. Battlefield density in this operation also increased exponentially.

The increase in tempo coupled with the higher battlefield density pushed most fights in Operation Iraqi Freedom far beyond the "stealth threshold" established in figure 3. Passive reconnaissance was practically useless for two reasons: The tempo was too high to allow for effective infiltration forward of the main body, and the threat force was rarely detectable by visual observation alone.

Conclusions

The framework above leads to several conclusions about the current direction of Army doctrine and force development. Most important, Operation Iraqi Freedom

conclusively establishes that effective reconnaissance often requires engaging an enemy in close combat. This is particularly true in rapid, offensive operations against an adaptive and elusive opponent. This is consistent with similar lessons learned at great cost during World War II and Operation Desert Storm. Furthermore, the interviews examined clearly reveal that modern surveillance technology, present in great abundance during Operation Iraqi Freedom, has not fundamentally altered this condition. For the Army to benefit from the lessons learned in this conflict, it must reexamine its basic assumptions about the power of surveillance technology and information dominance. Specific doctrinal and organizational changes that should result from this reexamination are outlined below.

Act Now, See, Understand, Adjust and Finish Decisively

Current Army doctrine frequently makes reference to a concept called the "quality of firsts." Under this concept, future tactical formations exploit a dramatically superior battlefield situational awareness that will allow them to, "see first, understand first, decide first, and finish decisively."[36] This phrase, mentioned no fewer than 13 times in the *Army Transformation Roadmap 2003*, is a foundational principle in the transformation effort.

The experience of commanders in OIF demonstrates that this is a flawed and misleading concept. American military might is based largely on the ability to maintain an operational tempo that vastly exceeds that of an adversary. Operational commanders will not forfeit this enormous advantage to allow tactical units to fully develop the enemy situation. On the contrary, they will insist that tactical commanders attack as rapidly as their logistics will allow. The call to "see first, understand first, act first, finish decisively" implies that a tactical commander has the luxury of seeing and understanding before acting. Operation Iraqi Freedom has demonstrated that this not correct. Tactical commanders must be prepared to "act now, see, understand, adjust, and finish decisively." This new mindset requires a fundamental readjustment of the way the Army fights.

Imagine, for example, Major General Buford C. Blount's dilemma on 31 March 2003 as, with his 3d Infantry Division poised on the outskirts of Baghdad, he contemplated the first major offensive into this heavily defended urban terrain. The extensive aerial reconnaissance of the city indicated an elaborate defense but offered little useful information upon which he could base a deliberate attack. If this had been a tactical scenario at the National Training Center or a simulation-based Warfighter Exercise, the observer-controllers would have strongly advised him to take the time necessary to carefully infiltrate reconnaissance assets into the city and fully develop the situation. Unfortunately, this tactically sound advice was operationally unfeasible. MG Blount saw that the Ba'ath regime was off-balance and that an immediate blow had the potential to quickly end the war. He had to maintain the tempo to exploit this opportunity. In this context, there was simply no time to see before acting. After recounting the dilemma, the book *On Point* explains the commanding general's decision:

Uncertainty abounded as to what available information and events said about the Iraq defenses in and around Baghdad. Yet instead of slowing his division's tempo to better assess and understand the enemy situation, Major General Blount pushed forward relentlessly. As the division advanced through the Karbala Gap to Objectives SAINTS and LIONS, he accelerated the attack in order to exploit success.[37]

Certainly, if either MG Blount or his brigade commanders had taken counsel of the Army adage to "see first, act first and finish decisively," he would have forfeited the division's tempo at great cost to his formation.

Army doctrine should stress that tempo is a crucial asymmetric advantage of U.S. forces. Tactical commanders must be prepared to operate at a tempo that frequently prevents the development of intelligence necessary to conduct a deliberate attack. For this reason, both Field Manual 3-0, *Operations,* and Field Manual 3-90*, Tactics,*[38] must explicitly state that movement to contact is the most common type of offensive operation. Brigade- and battalion-level deliberate attacks against known, templated enemy positions may still occur, but they will be extremely rare and will take place only at the initial outset of a campaign. Training scenarios at the combat training centers and mission-essential task list development should reflect this reality. Tactical scenarios should force commanders to act with little or no information about the enemy to their front. They must train to develop critical combat information on the move, understand that information, adjust their plan accordingly and defeat the enemy through dislocation.

Constructive simulations like Warfighter must also change to reflect the real problems of battlefield density. Large portions of the enemy will often remain practically invisible to even the most aggressive surveillance effort, particularly in heavily urban areas. Commanders must be prepared to attack into uncertainty and then react as the picture becomes clearer. Failing to advance in the face of this uncertainty poses a great risk to U.S. military advantage.

The Failure of Iconology

Future enemies have certainly learned from the experiences of the Iraqi military in the last two wars. If a BMP is easily destroyed at two kilometers but a pickup truck with an RPG can infiltrate to within 100 meters of a U.S. tank company, it makes little sense to continue to build battalions of BMPs. We can expect that future conventional enemies will attempt to blend in with the local population by employing forces in civilian clothing and mounted in commercial vehicles. As American UAVs proliferate on the future battlefield, the importance of "blending in" will grow. Adversaries will seek ways to deceive surveillance systems by avoiding detection or by becoming indistinguishable from the increasingly cluttered environment in which they operate. Because American military might is so effective at destroying the "red icon," the enemy will go to great lengths to avoid becoming one.

Battlefield density will increase, and finding the enemy through observation alone will become increasingly difficult.

Reconnaissance—A Combat Operation

Lightly armored scouts survive on the battlefield by trading armor for stealth. Stealth requires time—one luxury tactical commanders can expect to do without in the future. Future conflicts will almost certainly occur above the threshold that allows for stealthy reconnaissance. Additionally, the evolving nature of the threat will make that passive reconnaissance less and less useful. If the enemy looks just like the population he is hiding among, then observing him from a distance reveals little information of use to a maneuver commander.

Effective reconnaissance in the future will almost certainly require fighting. Ultimately, someone must go forward into the unknown and make contact with the enemy. If that element possesses the combat power to survive that contact and the flexibility to react, tactical commanders can sustain the tempo advantage, understand the enemy based on his actions and react faster than the threat. This will be the key to victory on the future battlefield. To engage in combat beyond the supporting range of friendly forces, reconnaissance forces must have access to the full suite of combined arms critical to tactical success.

Recommendations for Change

If fighting will be an integral part of future reconnaissance operations, scout formations at the battalion and brigade level are woefully unprepared for it. The Army should remove the remaining HMMWVs from the battalion scout platoons and from the reconnaissance troops of the armed reconnaissance squadron. While the recent decision to equip the ARS and battalion scout platoons of the heavy force with M1114 up-armored HMMWVs is a step in the right direction, this does not go far enough. With more than 2,000 pounds of extra weight, the M1114 represents the upper limit of armor protection that will fit on the HMMWV chassis. In spite of this, the vehicle is still vulnerable to destruction or disablement from 14.5mm or RPG fires. It is likely that commanders on future battlefields will not be able to employ their up-armored HMMWVs in traditional reconnaissance roles because of the severity of the enemy threat. Since the HMMWV carries the highly-prized LRASS system, future brigade and battalion reconnaissance units will have to fight without it. This will be an enormous setback that can easily be avoided today.

We have seen the futility of placing lightly armored scouts in heavy units in the last two wars. We should not wait to learn this lesson a third time. These platforms should be replaced with Bradley variants or another platform that is survivable against both the RPG and the recoilless rifle.

The LRASS has consistently proven its worth in combat and should be an integral part of future reconnaissance units. The Armor Center should look at ways to mount this system on the M3 in lieu of the missile launcher. Several technical limitations exist in fitting the LRASS onto the Bradley chassis, but these can be overcome with the proper investment of energy and expertise.

History teaches that, in real combat, a reconnaissance unit must possess heavy armor to operate beyond the supporting range of the force for which it is conducting reconnaissance. Equipped with only HMMWVs and M3s, the armed reconnaissance squadron of the Modular Force lacks this capability and is, therefore, closely tethered to the brigade combat team it supports. This will likely be a serious limitation, just as the lack of armor in the 81st Armored Reconnaissance Squadron hampered its reconnaissance capability in North Africa in 1943. With this in mind, the Army should equip each of the ground troops in the heavy armed reconnaissance squadrons with an M1 Abrams tank platoon. This will provide the squadron with sufficient armor protection to operate beyond the supporting range of its main body.

The Army has a historical tendency to accept force design changes that appear feasible so long as they meet a preestablished budgetary and fiscal constraint. Rather than selecting the best possible force, it tends to select any option that meets minimum acceptability criteria but achieves fiscal goals. In the 1980s and 1990s, the Goldsmith studies at the NTC made a compelling case for the feasibility of lightly armed reconnaissance platoons. Because this recommendation yielded significant savings in maintenance and procurement costs, it generated an irresistible momentum that quickly overwhelmed competing historical arguments about the failure of reconnaissance jeeps in World War II. Despite the overwhelming evidence from Operation Iraqi Freedom, the Army is in danger of making the same mistake again. A general shortage of tanks and Bradleys would be the worst possible reason to deny reconnaissance formations the equipment they need to accomplish their mission and survive on the battlefield. The reconnaissance system is simply too important to serve as the "billpayer" for other military initiatives.

Two centuries ago Clausewitz described the tension between the theoretical possibilities suggested by the limits and capabilities of weapons (war on paper) and the hard realities of real warfare. This tension continues today. The way in which the U.S. Army of the future handles the uncertainty and the fog of war lies at the heart and soul of the transformation effort. Surveillance technologies and the sophisticated information-processing capabilities of modern computer networks offer great promise to dramatically revolutionize the way tactical commanders leverage information on the battlefield. As with all technological innovations, there is a danger of learning the wrong lessons. Simplistic assumptions about the ability of units to slow and accelerate the tempo of their operation based on their need for reconnaissance has contributed to the flawed idea that future commanders will see first and then act. Operation Iraqi Freedom has revealed the danger

of this assumption. Despite having access to the most robust constellation of surveillance platforms ever assembled, battalion and brigade commanders uniformly agreed that they rarely knew what was in front of them. Rather than waiting to see and understand the enemy, they attacked anyway. Failing to do so would forfeit the greatest asymmetric advantage of U.S. forces. Some may argue that future improvements in technology will fix this problem; this prediction, however, is suspect. No commander interviewed said he would have been able to transition from a movement to contact to a deliberate attack if he had only had another satellite image. On the contrary, commanders were often inundated with this type of information and found it irrelevant. The enemy simply would not fit any template. His capability and intent were not discernible through observation from a distance. To understand the enemy, units had to go out and meet him on the ground. Effective reconnaissance that allowed a commander to visualize the enemy was almost always a combat operation. In Operation Iraqi Freedom, the Army relearned the lessons of World War II and Operation Desert Storm: gathering truly useful battlefield information requires fighting.

Endnotes

[1] Elizabeth P. Longford, *Wellington: The Years of the Sword* (New York: Harper and Row, 1969), p. 295.

[2] Louis A. DiMarco, "The U.S. Army's Mechanized Cavalry Doctrine in WWII," Master's Thesis (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College, 1995), p. 5.

[3] Mary Lee Stubbs and Stanley R. Conner, *Army Lineage Series: Armor-Cavalry Part I: Regular Army and Army Reserve* (Washington, D.C.: U.S. Army Center of Military History, 1984), p. 56.

[4] U.S. Department of the Army, Field Manual 2-10, *Cavalry Field Manual,* Vol. 2*, Mechanized Cavalry* (Washington, D.C.: U.S. Government Printing Office, 1941).

[5] DiMarco, "The U.S. Army's Mechanized Cavalry Doctrine in WWII," p. 22.

[6] *Ibid*, p. 58.

[7] *Ibid*.

[8] Martin Goldsmith and James Hodges, *Applying the National Training Center Experience: Tactical Reconnaissance* (Santa Monica, Calif.: RAND Corporation, 1987), p. 67.

[9] *Ibid.*

[10] Martin Goldsmith, *Battalion Reconnaissance Operations at the National Training Center* (Santa Monica, Calif.: RAND Corporation, 1996), p. 13.

[11] *Ibid., p. 16.*

[12] U.S. Department of the Army, *Operation Desert Storm Lessons Learned* (Tait Report), Vol. 3, *Operational*. (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College, 1992).

[13] Carl von Clausewitz, *On War,* Translated by Peter Paret and Michael Howard, (Princeton: Princeton University Press. 1984), p. 119.

[14] Summary Transcript of OIF-SG Interview with LTC Jeffrey R. Sanderson, Commander, 2-69 AR, 3d Infantry Division.

[15] Summary Transcription of Operation Iraqi Freedom Study Group (OIF-SG) Interview with LTG William S. Wallace, Commanding General, V Corps. OIF-SG interviews are available online in the U.S. Army Center for Army Lessons Learned (CALL) restricted archives.

[16] See OIF-SG interviews with COL William T. Wolf, Commander, 11th Attack Helicopter Regiment; COL David Perkins, Commander, 2d Brigade Combat Team, 3d Infantry Division; COL Ben Hodges, Commander, 1st Brigade Combat Team, 101st Airborne Division (Air Assault), and BG Benjamin C. Freakley, ADC-O, 101st Airborne.

[17] Perkins Interview.

[18] Freakly Interview.

[19] Summary Transcription of OIF-SG Interview with LTC Natalie Lee, G2, 4th Infantry Division.

[20] Verbatim Transcript of OIF-SG Interview with COL William Grimsley, Commander, 1st Brigade Combat Team, 3d Infantry Division.

[21] Summary Transcription of OIF-SG Interviews with COL Dave Teeples, Commander, 3d Armored Cavalry Regiment; COL David Perkins, Commander, 2d Brigade Combat Team, 3d Infantry Division; and COL Arnold Bray, Commander, 2d Brigade Combat Team, 82d Airborne Division.

[22] Summary Transcription of OIF-SG Interview with LTC Terry Ferrell, Commander, 3d Squadron, 7th Cavalry, 3d Infantry Division.

[23] Summary Transcription of OIF-SG Interview with MG James Marks, C2, Coalition Land Forces Component Command (CFLCC).

[24] David Talbot, "We Got Nothing Until they Slammed into Us," *Technology Review*, November 2004, p. 38.

[25] *Ibid.*

[26] Summary Transcript of OIF-SG Interview with COL Daniel Allyn, Commander, 3d Brigade Combat Team, 3d Infantry Division.

[27] Sanderson Interview.

[28] Summary Transcript of OIF-SG Interview with LTC Scott Rutter, Commander, 2d Battalion, 7th Infantry, 3d Infantry Division.

[29] Summary Transcript of OIF-SG Interview with LTC Stephen Twitty, Commander, 3d Battalion, 15th Infantry, 3d Infantry Division.

[30] Perkins Interview.

[31] Ferrell Interview.

[32] Summary Transcript of OIF-SG Interview with SPC Cassius Wilson, Cavalry Scout, Brigade Reconnaissance Troop, 2d Brigade Combat Team, 3d Infantry Division.

[33] Summary Transcription of OIF-SG Interview with CPT Scott Woodward, Commander, Brigade Reconnaissance Troop, 2d Brigade Combat Team, 3d Infantry Division.

[34] U.S. Department of the Army, Field Manual 3-0, *Operations* (Washington, D.C.: U.S. Government Printing Office, 14 June 2001).

[35] Richard Swain, *Lucky War: Third Army in Desert Storm* (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College Press, 1993).

[36] U.S. Department of the Army, *Army Transformation Roadmap* (Washington, D.C.: Government Printing Office, 2003), p. 1-7.

[37] Gregory Fontenot, E. J. Degen and David Tohn, *On Point: The U.S. Army in Iraq* (Fort Leavenworth, Kans.: U.S. Army Center for Army Lessons Learned, 2004), p. 283.

[38] U.S. Department of the Army, Field Manual 3-90, *Tactics* (Washington, D.C.: U.S. Government Printing Office, 4 July 2001).

Works Not Cited

Herbert R. McMaster, Colonel, *Crack in the Foundation: Defense Transformation and the Underlying Assumption of Dominant Knowledge in Future Warfare* (Carlisle Barracks, Pa.: USAWC Strategy Research Project, U.S. Army War College, 2003).

John D. Rosenberger, Colonel (Retired), *Breaking the Saber: The Subtle Demise of Cavalry in the Future Force* (Arlington, Va.: Association of the United States Army, June 2004).