JOINT FORCE QUARTERLY

JFQ

Unified Endeavor '95

Strategic Performance

Forces for Engagement

The American Revolution in Military Affairs

Logistics in Wargaming

D-Day Veracruz

Winter 96

A PROFESSIONAL MILITARY JOURNAL

JFQ

A Word from the Chairman

U.S. Air Force (Edward Littlejohn)

Crossing the Sava, December 31, 1995.

Recently I testified for the third time before both the House National Security Committee and the Senate Armed Services Committee on the posture and readiness of the Armed Forces, as well as on this year's defense budget. This annual event provides the Secretary of Defense and myself an opportunity to keep Congress informed, a necessary first step in the fulfillment of their constitutional responsibilities for the national defense. We also get their ideas and concerns firsthand, which is valuable for us in managing the force.

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The cover features amphibious assault vehicles in Kuwait (U.S. Marine Corps/Michael J. Anglin); the front cover insets (from top) show joint information bureau for Unified Endeavor (U.S. Air Force/Randy S. Mallard), German POWs taken at Anzio (U.S. Navy), crewman releasing cargo sling of CH–46 Sea Knight on board *USS Theodore Roosevelt* (U.S. Navy/Darin Osmun), F–16 Fighting Falcon during Joint Task Force 95–3 (U.S. Air Force/Mike Reinhardt), and American forces landing at Veracruz in 1847 (*Eyewitness to War*).

The front inside cover includes (clockwise) M1A1 Abrams tank on maneuvers in Kuwait (U.S. Air Force/Tracy Hall-Leahy), B–117 Stealth fighters (U.S. Air Force/Marvin Lynchard), 105mm howitzer for Roaring Lion (U.S. Air Force/Chris Putman), HC–130N/P Combat Shadow during Foal Eagle '93 (U.S. Air Force/Mike Reinhardt), Marine sniper training (Military Photography/Greg Stewart), and *USS Carl Vinson* (U.S. Navy/David C. Lloyd).

The table of contents photos are (from top) ranger preparing to jump with combat load (U.S. Army/Daniel Hart), B–1 bomber (U.S. Air Force/Brett Snow), and night operations on carrier deck (U.S. Navy).

The inside back cover captures F–15 Eagle during Cobra Gold '95 (Joint Combat Camera Center/Raymond T. Conway).

The back cover shows a Navy tanker in transit through the Panama Canal (U.S. Navy).

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Joint Force Quarterly

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The editors invite articles and other contributions on joint warfighting, interservice issues that support jointness, and topics of common interest to the Armed Forces (see page 132 for details). Please direct all editorial communications to:

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A WORD FROM THE CHAIRMAN

(*continued from page 1*)

While a number of articles in this issue of *JFQ* focus on the revolution in military affairs, which is a vitally important matter for the Armed Forces in the long term, we must also remember that the future force begins with today's budget. Accordingly, my presentation to Congress, which is summarized below, dwelt on the budget as well as recent operations.

With regard to operations we have marked two milestones lately. First, two months ago at Guantanamo Bay we held a closing ceremony for JTF–160, the organization that for the previous 20 months had superbly handled a delicate refugee crisis in the Caribbean. This task force plucked some 60,000 refugees from the ocean, built 15 huge camps to house, feed, and care for them, and provided safe and humane conditions until the refugees were either repatriated or admitted into the United States. Throughout the operation, JTF–160 handled these refugees with great compassion and understanding, attending to their needs with unequaled efficiency. The mission accomplished, the camps have been closed and the task force returned home.

The other milestone occurred on February 7 in Haiti when René Préval was inaugurated as president to succeed Jean-Bertrand Aristide, who stepped down. This was the first time in Haitian history that power passed from one freely elected leader to another. The forces which were sent to that troubled nation in September 1994 are now coming home, having accomplished their mission superbly, on time, and with utmost care for their own safety. The results speak for themselves. Out of the original 23,000, there are only 800 servicemen and women remaining in country today. By April 15, all remaining U.S. forces will be out of Haiti and we will shift to periodic exercises with engineering troops, much like those that we conduct with other countries in the region.

Last December we began to deploy, together with our NATO allies and other partners, to oversee the Bosnian peace accord. In the brief interval since then, our presence has proven to be pivotal, both in forging the coalition and in maintaining momentum toward peace. We have helped to administer the withdrawal of warring factions from zones of separation as well as to physically separate former combatants for subsequent withdrawal from the territories to be transferred. While there are still problems to overcome—such as pockets of banned foreign forces, the full exchange of prisoners of war, and the occasional intransigence by various factions—the overall operation is proceeding better than nearly all of the critics predicted.

F–16 refueling during Provide Comfort.

U.S. Air Force (Gudrun Cook)

In Bosnia, as in Haiti, we have seen the great benefit of thorough preparation, adherence to the mission that we set out to perform, and the maintenance of well trained, highly ready forces. Our commanders correctly identified the threats: mines, lone snipers, weather, and dangerous road conditions. By a combination of sound precautions and good training, they have so far minimized casualties. During three visits to the area since the operation began, I have seen nothing but superb leadership, high morale, and complete determination on the part of the roughly 20,000 men and women in Bosnia, and the several thousand more supporting them from adjacent countries. In our remaining months in Bosnia, we must ensure that our forces are as ready, alert, and resolute on the last day as they were on the first. That is the best guarantee to the success of the mission and the safety of the force.

in Bosnia, as in Haiti, we have seen the great benefit of well trained, highly ready forces

There are also some 23,000 members of the Armed Forces deployed in the Persian Gulf region, preserving peace, enforcing U.N. sanctions against Iraq, protecting the Kurds in northern Iraq, and deterring further aggression by Baghdad. At the same time we are continuing to improve our ability to respond to unexpected threats, working with regional allies to strengthen the readiness of our coalitions and enhancing our prepositioning programs. Since the Gulf War, we have made significant gains in our ability to respond rapidly to aggression in this vital region.

Meanwhile, the 36,000 men and women stationed in Korea have remained vigilant and are keenly aware of deteriorating conditions to their north where the potential for instability, fueled by severe food and energy shortages, continues to increase. Our forces and those of South Korea have not forgotten that they serve in the most dangerous corner of the world, one where we must continually improve our posture. Given force modernization, efforts at increasing interoperability with allied forces, and improvements in prepositioning programs over the past two years, we have made substantial strides in improving our deterrent and defensive posture in South Korea.

The operations I have described only involve a small part of our overall force. The balance has been actively engaged in other operations, in training and maintaining readiness to respond to wartime missions. But there is an important point to stress about operations over the last year and the ready state of our forces. We have conducted a series of successful military operations. There

***USS Kauffman* with Haitian ship in tow.**

U.S. Navy (Scott Gureck)

have been none of the problems that we experienced in the 1970s and early 1980s. Part of our success can be attributed to Goldwater-Nichols, legistation which improved command and control as well as the prospects of unified action in complex contingency operations. Above all, however, our success is a tribute to the courage, skill, and dedication of our people and their leaders.

Another factor in our successful operations has been the high readiness of our force which, in turn, is based on the support of Congress and the American public. On becoming Chairman two and a half years ago, I asked that Congress keep readiness our top priority and that we not allow it to erode or atrophy, as happened so often in past drawdowns. The benefits of that support for the readiness of our Armed Forces are clearly evident.

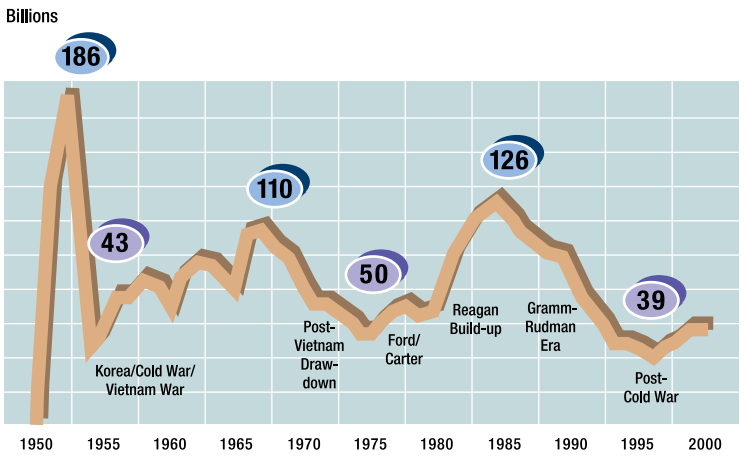
we must commit ourselves to a procurement goal of approximately $60 billion annually to remain ready

Next year will mark the end of the massive drawdown begun when the Cold War ended. We have been through the deepest cut since the end of the Vietnam War while not undermining the excellence of our people or equipment. For once we have got it right; we have broken the cycle of feast and famine in military budgeting. The result is a sustained, high quality force.

Proof of this is not hard to find. Judging by last year's enlistment data—which showed that over 96 percent of initial recruits were high school graduates—we are continuing to attract and retain the kind of men and women America needs in uniform. As far as equipment goes, a hidden benefit of the drawdown has been that it allowed us to discard the oldest equipment in our inventories and to redistribute the newest and most modern within our remaining force structure.

But we have paid a price. Preserving readiness and force structure has come at the expense of modernization and equipment replacement. We have recently undergone a procurement hiatus to the extent that our procurement account has actually shrunk to just below $40 billion, the lowest level since before the Korean War. For years this hiatus was acceptable, but it cannot be sustained indefinitely. We soon will no longer be able to rely upon what was built in the 1980s. We must commit ourselves, sooner rather than later, to a procurement goal of approximately $60 billion annually, if our force is to remain as ready tomorrow as it is today. I am becoming concerned that, if we do not commit ourselves to that target in the near term, we may never meet it.

Defense Procurement



All amounts are shown in fiscal year 1996 dollars.

That $60 billion will go a long way toward both protecting existing military structure and enhancing its capabilities. We must sustain our strategic lift improvements by passing, this year, the multi-year procurement for the C–17 transport aircraft. We must also make more progress in meeting our sealift objectives. Furthermore, we must not forget that prepositioning initiatives are an essential part of strategic lift solutions. Now that we are more and more an expeditionary force, strategic air and sealift, complemented by prepositioning initiatives, must be our number one warfighting priority.

Other priorities are also pressing. We need to continue with improvements in command, control, communications, and computers, and in intelligence, surveillance, and reconnaissance systems. We must maintain our emphasis on the readiness of the fifteen enhanced National Guard brigades. And we must continue to field the long-range, precision munitions and systems that give us such a decisive edge.

The challenge, of course, is to maintain readiness, support the current force structure, procure enhancements for our force, and to push ahead with recapitalization of the force, all within the current top line of the defense budget. Acquisition reform and base realignment and closure savings will move us in the right direction, but we must also move forward with privatization and outsourcing, take another look at further reducing our infrastructure, and continue to find savings in reduced redundancies and increased jointness.

Of course, the CINCs, service chiefs, and I must also continue to make hard choices and create new efficiencies in the way we fight. In the past two years, we have devised new joint processes to examine the most efficient and effective ways to improve joint warfighting, and to look for and reduce unnecessary redundancies and combat systems that have marginal benefits. With these processes in place, I am better able to offer the Secretary of Defense recommendations from a joint warfighter's perspective on programmatic and budgetary issues. Through the Joint Requirements Oversight Council (JROC) and its supporting processes, I have already offered specific recommendations to the Secretary of Defense in the past year, and I intend to continue to strengthen this process.

In all, we have the finest and the most ready military force in the world. That force has just engineered the most successful post-war drawdown in American history. We have protected our readiness, our ranks continue to be filled with men and women who are the envy of every other military in the world, and we have simultaneously accomplished a series of successful operations all over the globe. These achievements will continue if we bring our procurement up to $60 billion per year. Following this course will enable us to have the same ready force tomorrow that we are blessed with today.

JOHN M. SHALIKASHVILI
Chairman
of the Joint Chiefs of Staff

Letters . . .

OPERATIONS OTHER THAN WAR

To the Editor—Ann Story and Aryea Gottlieb argued in their recent article (*JFQ*, Autumn 1995) that doctrine for operations other than war is a hodgepodge of terms that lacks a unifying structure. They propose to reorganize doctrine by distinguishing between combat and noncombat operations. While their distinction is clear and simple, it is inadequate as a review of the military operational framework derived from it suggests.

Under combat operations, the authors list war, retaliatory actions, and operations to restore order. While these categories involve combat, the latter two are fundamentally different from war. Under both military force is subject to a host of political constraints that would not apply in war. The retaliatory strike that is cited, Eldorado Canyon, is a perfect example. Political considerations dictated even the weapons to employ. Similarly, when restoring order it is political considerations that determine every aspect of military operations, even tactics, because small unit actions can have a strategic impact as explicitly noted in Joint Pub 3-07. Such examples suggest why the distinction between combat and noncombat is inadequate to describe the different ways force can be used.

The same inadequacy is apparent in the noncombat part of the operational framework which includes shows of force. While we do not intend to use force in such cases, we must be prepared to use it, and the fact that force is considered implies that an enemy is at hand. This distinguishes these operations (and, one might add, insurgency and counterinsurgency support as well as some counterdrug operations) from other noncombat operations such as disaster relief.

While a distinction between combat and noncombat operations is important, it is inadequate because it does not focus on why military force is being used, which is the decisive question. The warfighting mission is to destroy the ability of an enemy to resist. Military objectives should take precedence over almost every political consideration because unless military objectives are achieved political goals will not be realized. The military also is used in situations where there is no struggle with an enemy but where the special capabilities of the Armed Forces can nevertheless be applied. What Story and Gottlieb have called *support and assistance operations* and *truce-keeping* are in this category. Finally, in cases that fall between warfighting and non-adversarial military operations, force or other appropriate means may be used. Here combat capabilities are rightly constrained by the requirements of other coercive means as well as a host of political considerations that affect the nature of the military operation.

Regardless of the terminology finally selected for categorizing operations other than war, it is insufficient to make a distinction based on the presence or absence of combat. Instead categories should be delineated by the purpose for which force is used, since purpose determines operational method and, by extension, doctrine. Three categories that should be distinguished are: operations where no adversary is present and thus force is not required, operations where limited force is used as part of a coercive process calculated to alter political relationships, and operations in war where force is used to achieve strategic military objectives by destroying enemy forces and taking terrain. Doctrine based on these distinctions will help to dispel the confusion that the authors rightly note permeates doctrine today.

—BG Thomas E. Swain, USA
Deputy Assistant Secretary of Defense for
Special Operations and Low-Intensity
Conflict (Policy and Missions)

To the Editor—As one of the authors of Joint Pub 3–07, *Joint Doctrine for Military Operations Other Than War*, I want to comment on the article, "Beyond the Range of Military Operations," by Ann Story and Aryea Gottlieb.

Even though the framework contained in Joint Pub 3–0, *Doctrine for Joint Operations*, and Joint Pub 3–07 may not be the best, Story and Gottlieb have failed to make a convincing argument for replacing it. The 3–0/3–07 framework is not that hard to understand. While *war* is described and not defined in the pubs, most of us have a good notion of what war is. MOOTW is comprised of those things that war is not. Moreover, Joint Pub 3–07 explains that MOOTW includes combat and noncombat situations. So the argument that MOOTW is principally noncombat is invalid.

The framework found in the article is flawed. Most attempts to categorize or group military operations risk oversimplifying them and frequently are wrong. No matter how Story and Gottlieb qualify their framework, it creates added confusion and misunderstanding. A model that rests on describing mission types as either combat or noncombat is patently wrong.

The categories offered by Story and Gottlieb serve no purpose. They do not meet the *why* or *so what* test. If one accepts this grouping as a way to more easily memorize mission types, the result is oversimplification. Seemingly simple operations are complex undertakings and should not be trivialized. Each situation is unique and must be understood as such. That is why both officers and NCOs are paid more—they must know what to do when a non-textbook challenge arises.

What is more, the grouping suggests that there are absolutes in military operations: combat, noncombat, and others which may be either. While some operations start as combat, others do not but can turn to combat, in which case we must be able to deal with them. The issue here is that the purpose of conducting an operation is not whether it involves combat, use of force, non-violence, or relief. The purpose of each operation is to achieve a specified endstate that supports a political objective.

The grouping advanced does not address mission types that may or may not be defined by combat. In fact, with a few exceptions, an argument can be made that there are mission types that simply do not fit neatly under any category. The article identifies two new types which are termed *operations to restore order* and *retaliatory actions* (vice strikes and raids) and places them on a level with war under the heading of *combat operations*. This categorization ignores the fact that missions such as peace enforcement and enforcing sanctions may involve only a threat of force. Also, strikes and raids may be preemptive, a type of operation for which the article offers no term of art.

Story and Gottlieb place missions that may involve combat under the rubric of *noncombat operations*. One example of this type of operation is the airlift of humanitarian aid to Bosnia, which was termed a humanitarian assistance mission. But the threat from the ground was so high that the aircraft were equipped with defensive systems. This is interesting since similar aircraft flew in two wars without such systems. So even humanitarian assistance may involve combat.

Many controversial aspects of Joint Pub 3–07 have been overcome in recent years, although some remain even after its approval in June 1995. Its most important achievement was to begin to clarify MOOTW. While not perfect, it must be kept intact long enough to examine its framework. But one point is certain: a framework for military operations cannot rely upon a combat/noncombat model. Distinguishing between combat and noncombat will be increasingly difficult in the future. Nonlethal technologies may offer more potent means, a development that will pose challenges for defining a military operations framework in the 21st century.

The Armed Forces are organized, trained, and equipped to conduct a range of operations in times of war or any time that the Nation calls. In this sense all operations are *military operations*.

—Maj Russell S. Hall, USAF
Army-Air Force Center for
Low Intensity Conflict

SOMALIA LESSONS

To the Editor—I was interested to read the article by COL Kenneth Allard entitled "Lessons Unlearned: Somalia and Joint Doctrine" in your last issue. However, I was surprised by his statement that "there were three de facto chains of command, namely, the United Nations, U.S. Central Command, and U.S. Special Operations Command." As commander in chief of U.S. Special Operations Command at the time of TF Ranger operations, I did not have real or de facto operational command of special operations forces (SOF) deployed to Somalia.

Under the Goldwater-Nichols Act, commanders in chief of theater unified commands have combatant command (COCOM) of all forces employed in their areas of operations. This principle of law and joint doctrine held true for operations in Somalia. GEN Joseph P. Hoar, CINCCENT, exercised COCOM of all forces in Somalia, to include those that made up TF Ranger. Specifically, the task force commander reported directly to GEN Hoar and not to me. He also fully coordinated and deconflicted all operations with the commander of U.S. Forces Somalia. It was through this latter relationship that TF Ranger called for the quick reaction force composed of U.S. and U.N. forces on October 3. Moreover, the commander of U.S. Forces Somalia had operational command of all other SOF assigned to his JTF, which included special forces, psychological operations, and civil affairs personnel.

Allard has also published a longer study on which this article is based—*Somalia Operations: Lessons Learned*. Interestingly, that work better defines the command relationships in Somalia by correctly pointing out that the commander of TF Ranger reported "directly back to USCENTCOM without going through either U.S. or U.N. channels."

While there are indeed many lessons learned from our Somalia experience, we must ensure that they—and any conclusions which we draw from them—are based on fact.

—GEN Wayne A. Downing, USA
Commander in Chief, Special
Operations Command

OUR ROLES AND MISSIONS

To the Editor—The Armed Forces have reached a critical juncture in their evolution. Although our mission is to fight and win the Nation's wars, we are in danger of doctrinally and rhetorically writing ourselves out of a job. This was apparent in recent foot dragging and quibbling over roles and missions on a range of issues including counternarcotics, counterproliferation, peacekeeping, peacemaking, and nationbuilding. Instead of embracing an expanded view of roles and missions within the broad terms of national interests and security, we seem to be content to hide behind the shield of "mission creep" and a probability of fighting conventional conflicts together with coalition partners against some convenient bogeymen.

The traditional threats to what is broadly refered to as national security are not so much changing as our response to them is undergoing a transformation. On the Korean peninsula, a future conflict probably will be a come-as-you-are affair. Lacking concrete attack indicators, it is likely that we will fight and win with South Korean and American forces that are available rather than having the luxury of a long build-up period.

On the Arabian peninsula, a build-up in the face of a credible threat is more probable, but again the outcome will be a foregone conclusion provided we have the necessary political and moral will. However, analysts such as Lawrence Korb have even discounted the probability of fighting a two-front war under current conditions.

Against the background of vacuous—albeit well defined—threats comes the risk of further cuts in the defense budget. Since the political and economic fallout of eliminating high dollar (and industrially important) weapons systems is enormous, it is clear that cuts can and must occur in the force structure. The argument will be advanced, absent overseas missions (the Bosnia operation is scheduled to end later this year), that such a large force is unnecessary.

Quite frankly, the time has come for the military to justify its existence at current levels, lest we run the risk of enduring an extensive drawdown. While the *raison d'être* is obvious internally, it is important to note that military experience is lacking among most members of the executive and legislative branch and can be expected to decrease even further with the passage of time.

This reasoning may appear limited and selfish, but it is the bottom line. There is, however, another reason for an expanded role. In a period when there is a lot of talk about "challenges" and "taking action," there are not many organizations who are actually willing to do something. While our national security may not be at stake (at least presently), if the United States is going to take the lead in world affairs, someone will have to be tasked to walk the proverbial "point."

But doesn't this run risks? Are the lives of our soldiers worth it? This is a volunteer force. Although most servicemembers enlist for either educational benefits or job security, the chance to be involved in operations that can benefit oppressed, beleaguered, or impoverished people presents a real opportunity to *serve* in the finest sense of the word. Moreover, deployed forces have better safety records and lower mortality rates than non-deployed forces. Even in the Persian Gulf War, more soldiers died as a result of traffic accidents than in combat.

Greater military involvement does not mean running carelessly down a darkened alleyway. More interaction and liaison between the Armed Forces and other governmental agencies as well as nongovernmental organizations will ensure that military capabilities are presented to policymakers and that our senior officers have a voice in the decisionmaking process. As impartial participants members of the Armed Forces can help to define its roles and missions of the future.

Wider roles and missions for the military will require a shift in the focus of training. While there will be requirements for new assets and training resources, what it really required is greater mental agility. This will be facilitated by educated soldiers. They will have the knowledge to shift gears when assessing the situation and dealing with an opponent in a nonlethal situation.

The military faces a choice. We can stay the course and argue against doing anything but fighting the Nation's wars. But here we run the risk of further drawdowns and loss of public confidence. Furthermore, there is a danger of not preparing for operations that we may be directed to conduct and not being ready. The alternative is to be proactive—involved in the decisionmaking process, preparing for nontraditional missions, and undertaking them. The payoff for the Nation and the Armed Forces will be immense. We have a chance to make a difference and help to shape the world of the 21st century. We should not allow this opportunity to elude us.

—CPT Stewart W. Bentley, USA
Joint Military Intelligence College

put your pen to paper . . .

JFQ welcomes your letters and comments. Write or FAX your correspondence to (202) 685–4219/DSN 325–4219. Internet JFQ1@ndu.edu

BACK ON TERRA FIRMA?

To the Editor—After reading the letter from LT Hokanson in your last issue (*JFQ*, Autumn 95), I concluded that it would be difficult to refute his evidence and argument—that the Nation does not need an Air Force—since his case was incoherent. But his opinions, generalizations, and factoids pointed to a more basic problem that deserves a response.

I have faith in the statesmen and visionaries who established the three military departments, and I believe that the role of each service is vital to national security. Moreover, I am convinced that teamwork and trust among the services are essential to victory in war. General Dwight Eisenhower said, "We have got to be of one family, and it is more important today than it ever has been."

As I was growing up, my younger sister sometimes got more attention, knew things that I didn't know, and did things that I couldn't do. I suppose that when I see her now we could spend our time rehashing childhood jealousies. But we don't. We talk about the future and what we can do together. We've grown up.

—Maj W. Eric Herr, USAF
School of Advanced Airpower Studies

To the Editor—The trouble with the letter by LT Hokanson in the Autumn 1995 issue is that it reveals a history instructor at the Naval Academy who is a historical revisionist. He makes several historical errors and emotional arguments in proposing to eliminate the Air Force. Let me set the record straight.

First, General McPeak did not declare that the Air Force would be willing to give up major missions to the Army and naval air arm, except for long-range bombing. None of my colleagues here at the Air Force Doctrine Center remember any such comment from our former chief of staff. He did allow that the Air Force might cede close air support to the Army and the Army might yield air defense to the Air Force.

Hokanson wrongly claims that the Air Force was a creature of the Cold War. The idea for a separate air service was conceived long before the Cold War and resulted from the decisive role that airpower played during World War II. While the Cold War is over, airpower is still decisive in joint warfighting as validated by Desert Storm (which is not to say that airpower won the war as some argue—but it was the reason for a short, low-casualty ground campaign). The Air Force, not the Navy, is the principal projector of airpower. This does not mean that the naval air arm is an unimportant part of joint force air components. However, there is no way in which the Navy can supplant the Air Force in power projection strategy by appropriating long-range bombing.

Those are only a few points. The letter also makes several other errors highlighted below:

Submarines are the most viable leg of the outdated strategic triad; therefore the Navy should be in charge of all long-range strategic bombing. The redundant nature of the triad remains viable and necessary. The manned bomber is still a player, in part because of its flexibility. Once employed it is the only leg of the triad that is recallable. B–2s can penetrate air defenses and strike anywhere (naval weapons notwithstanding) within a day of execution. B–52s are old, but they are not outdated as Hokanson claims. While unable to penetrate modern air defenses on a long-range nuclear strike profile, they can launch standoff weapons with similar capabilities.

Since U.S. Strategic Command is headed by a naval officer it would be easy to turn it from a joint into a Navy command. Perhaps it would, but not too smart. It presupposes transforming the triad into a uniad. The Air Force could argue that when the next CINC is appointed (who will come from its ranks) it will be only a small step to turn this joint command over to the Air Force.

Tomahawk cruise missiles give the Navy a long-range strike capability—within a thousand miles of any coast—*and the Navy should thus get the long-range bombing role.* Tomahawks offer a valuable power projection capability in theater. But will the Navy have sufficient numbers to visit as many targets as manned systems bombed, with the same precision as during the Gulf War? Is Tomahawk flexible enough to change tasking at the last minute like a manned system? No, on both counts. What about targets more than a thousand miles inland? (Hokanson claims TLAM has a range of a thousand miles, yet I'm told it is more like 650–700 miles, including the distance from launch platforms to shore.) And long-range bombing? Will targets farther inland be hit by Navy B–1s, B–2s, or B–52s? Oops, I forgot, they are outdated. So much for targets beyond the littorals.

Lack of coordination in long-range strike war can be solved if the Air Force is phased out and the Navy is given all long-range bombing missions. Makes sense! The fewer the players, the easier the coordination. Fortunately, doctrine and procedures for JFACCs and their staffs provide coordination among the services and coalition partners. Actually, coordination simply becomes an intraservice rather than interservice problem in Hokanson's little world. Air war, regardless of the players, involves immense coordination within an air arm and with other components.

The Navy can fulfill much of the long-range and strategic bombing mission. Oops! That is true, but "much" won't do. Hokanson undercuts his argument against the use of joint airpower. This is why we have joint warfare. Each service has unique capabilities that complement the others, which is even more important as forces are pared down.

When the Air Force is scrapped, redundancy in transport, nuclear weapons, tactical air, long-range strike, et al. would be eliminated. Can carrier battlegroups produce the requisite fighter sorties to mount a Desert Storm-type campaign? Are there enough carriers? Does the Navy have transport aircraft to haul the people, weapons, and materiel? No. And what about space? Using a similar argument, couldn't we disband the Marine Corps? After all, the Army has performed more amphibious landings than the Marines. Even better, can't we justify eliminating the Navy since the Army has more ships? That would greatly reduce redundancy. Stationing Air Force P–3s armed with Harpoons at strategic points around the globe could maintain sea control. It would also save money because there would no longer be a need to maintain all those ships.

The Navy is built around the strength of airpower projection and, as the on-call air arm, would permit the elimination of the Air Force. Presidents may ask "where are the carriers?" but are they in the right place? Probably not. They are not as flexible as our Navy brethren would have us believe. In the right place, carriers are effective tools of national policy. Even if the Navy is built around airpower, it is not *air-minded.* Of course, the Navy relies upon seagoing capabilities for airpower projection. The Air Force—air-minded—lives and breathes strictly with the projection of air and spacepower in mind. We need a service focused on the projection of airpower.

Each service has unique capabilities. While some seem redundant, overlapping functions are actually complementary—the means to project power in theater or elsewhere vary. Never stoop to faulty historical or emotional arguments when debating roles and missions.

—Lt Col Wade McRoberts, USAF
Air Force Doctrine Center

U.S. Navy (Kenneth J. Riley)

U.S. Atlantic Command and Unified Endeavor '95

By JOHN J. SHEEHAN

Though volumes have been written on the lessons of the Persian Gulf War, many analysts overlook what is perhaps the most important point: an enemy should not give the United States and its coalition partners six months to prepare for battle. It is unlikely that an enemy will afford us as much time in the future to get command and control structures and logistics systems in place before an attack. It is more likely that the commander of a joint task force (JTF) and his forces will have to arrive in-theater ready to fight as a joint team. How can we assure that the forces which forward supported CINCs receive can fight jointly? What is the most effective and efficient way to train JTF staffs? How can we best leverage technology in joint training? U.S. Atlantic Command (ACOM) is working on the answers to these and other important questions.

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The current environment has forced us to find other ways of preparing for and responding to crises around the world. Training JTFs and their component staffs to operate as coherent units prior to deployment overseas is our goal. ACOM has been improving the capabilities of CONUS-based forces since its establishment in 1993. In the area of field training exercises, feasible service exercises have been modified to encompass joint mission essential tasks. We believe that joint warfighting capabilities can be enhanced the most by focusing on JTF commanders, components, and staffs. These command post exercises will incorporate the strides made in computer assisted exercises as well as modeling and simulation.

Unified Endeavor (UE) exercises use an existing three-star service component commander and his staff and train them to form and operate a JTF. From January to April 1995, the Army's III Corps was the core element for one of these exercises, Unified Endeavor '95.

Background

Unified Endeavor '95 represented the first ACOM developmental, simulations-based JTF staff training exercise. It was divided into an academic training phase, an operation order (OPORD) development phase, and a plan execution phase. Each phase focused on a period when JTF operations are the most critical to mission success and spread out to allow the commander and his staff to train to task in a manageable yet realistic fashion, given the busy world of operations tempo and commitments.

The scenario was set in Southwest Asia and envisioned a notional JTF–780 made up of an Army reinforced heavy division, an Air Force reinforced composite wing, a Marine expeditionary force forward (MEF), a carrier battlegroup and an amphibious ready group, and special operations forces. The opposing force (OPFOR) fielded seven combined arms divisions. The exercise was a distributed training and technical success as well as a proof of principle for the joint training plan (JTP)-driven JTF training initiative.

Phased Training

The objectives of each phase of UE '95 were aimed at a particular audience. Unlike some exercises, it had a goal of reducing cost in time, personnel, and operations and maintenance funds. Fundamentally, it sought to add value to training the JTF staff and supporting component staff members. Without a major deployment of forces to drive the actions of the staff, the exercise offered a degree of focus, control, and flexibility unattainable in large scale field training exercises.

UE '95 offered focus, control, and flexibility unattainable in large scale field exercises

Phase I—Academic Training. Seminars led by key members of the ACOM staff were held for the core element of each designated JTF and component staff, plus selected augmentees. This training focused on the roles of JTF commanders and their staffs, staff procedures, joint planning, joint doctrine, and joint tactics, techniques, and procedures (JTTPs) with the commander acting as principal trainer. He set the objectives and provided guidance to the chief of the JTF training team (JTT), ACOM J-72, before the exercise. Then JTT designed and executed training with constant feedback from the JTF commander. A senior observer (a former CINCSOC) served as mentor to the JTF commander and staff which enhanced the experience of the exercise.

The first phase took place over five days in the battle simulation center at Fort Hood, which was the JTF home station. The seminars were conducted at the executive and action officer levels. Phase IA was three days and taught commanders and principal staff members the fundamentals of joint operations. It ended with the opportunity to obtain the commander's guidance on operational concepts. Phase IB was a day-long seminar immediately preceding phase II and was designed to refocus principal staff planners on the exercise scenario and commander's intent for the campaign. This phase dealt with JTF formation and joint planning procedures. Phase IC was also one day of seminars prior to phase III. It was designed to refocus the entire staff on the exercise and centered on functional tasks and preparing staff sections and personnel for their responsibilities. ACOM developed seminar outlines (lesson plans) for each seminar.

Phase II—OPORD Development Exercise. This phase, which lasted a week, emphasized JTF staff planning procedures and the application of joint doctrine and JTTPs to the commander's concept of operations. Participants included the supported theater staff (U.S. Central Command) as well as the supporting CINC (ACOM), Joint Intelligence Center, JTF commander and staff, and component staffs. The Chairman was the principal trainer, with the ACOM staff and JTF training team helping to meet the objectives. The senior observer mentored the Chairman and staff.

In this phase, the JTF planning staff, including component liaison teams and augmentees, assembled at the JTF home station to build staff procedures and working relationships. In the near future, at the option of the JTF commander, this phase may be hosted at the ACOM Joint Training, Analysis, and Simulation Center (JTASC) in Suffolk, Virginia, to afford a self-contained exercise environment free of daily obligations at home stations. Component planning staffs will normally remain at their home stations to reduce cost and retain realism. During UE '95, the 8th Air Force commander deployed his JFACC planning staff to Fort Hood. Based on the operational situation, the Navy component commander remained at his home station as did the commander of II Marine Expeditionary Force. This second phase helped in team building and in developing and validating procedures. After the introduction in phase IB, the JTF staff was presented with a crisis situation based on a real world scenario. They then developed an OPORD, complete with supporting component orders as well as a time phased force deployment data list (TPFDL). The JTF commander's course of action development and wargaming efforts were supported by various modeling and simulation capabilities. The completed OPORD was reviewed by key members of all staffs and groomed for execution during the next phase.

U.S. Air Force (Lee E. Rogers)

Joint Information Bureau, UE '95.

U.S. Air Force (Russ Pollanen)

Fort Hood—site of Unified Endeavor '95.

Phase III—OPORD Execution Exercise. This week-long phase, which was held as soon as feasible after phase II, also included both the supported and the supporting CINC staffs, Joint Intelligence Center, JTF commander and his staff, and components. The entire headquarters staff assembled at Fort Hood, an excellent site with the infrastructure to support a robust but realistic JTF headquarters environment. This phase focused on execution procedures, decisionmaking, and applying joint doctrine and JTTPs to operations. The JTF commander, ACOM staff, JTF training team, and senior observer played the same roles as in phases I and II. Following IC, JTF–780 executed the plan developed in phase II in a simulations-driven wargame against a "thinking" and reactive OPFOR. This phase used a sophisticated confederation of service simulation models to exercise a broad range of joint warfighting skills and fully tax the training audience.

distributed simulation architecture allowed commanders to take part from home stations

Exercise Design and Support

With developmental help from the Joint Warfighting Center, the aggregate level simulation protocol (ALSP) confederation of models replaced deployed warfighting personnel and equipment as the driver for staff training in the UE '95 phase III OPORD execution exercise. The distributed simulation architecture allowed the JTF commander as well as most of his component commanders to take part from their home stations to replicate the separation of an actual contingency and realize savings by minimizing deployments. The ALSP confederation was used because it accommodates two-echelon training audiences, offers a comprehensive intelligence package, reduces simulation cost and risk by employing existing service models, and adds value for component participants by making JTF training meaningful for service and joint communities.

JTF Training Division (J-72) at ACOM, which has overall responsibility for the conduct of training, gathers data on real world operations to provide an after action review and discern lessons learned for the commands involved. J-72 recently concluded such a mission supporting the JTF in

Confederation Models Used in Unified Endeavor '95

Model	Warfare Area
Corps Battle Simulation (CBS)	Ground
Air Warfare Simulation (AWSIM)	Air
Research, Evaluation, and Systems Analysis (RESA)	Naval Air, Surface, and Subsurface
Tactical Simulation Model (TACSIM)	Intelligence
Electronic Warfare Simulation (JECEWSI)	Joint Electronic Combat/Electronic Warfare

Operation Uphold Democracy in Haiti. It also manages joint doctrine issues for ACOM, develops and promulgates ACOM JTTPs, develops JTF standard operating procedures, and assists in the design and evaluation of CONUS joint exercises and training. To this end, teams, groups, and documents were developed and successfully employed during UE '95. They included:

Training Teams. All three J-72 teams consist of operational-level, joint warfighting subject matter experts from each service. JTF training teams (JTTs) develop, execute, and maintain the phase I academic training program. They also lead the design, planning, and execution of phases II and III. During execution, teams are augmented as needed by functional (intelligence, logistics, public affairs, et al.) subject matter experts from the ACOM staff and supporting agencies. JTTs work closely with the designated JTF commander to tailor the basic training program to meet the JTF commander's training objectives and operational requirements.

Observers/Trainers. In phases II and III of UE exercises, JTT assumes the role of the joint observer/trainer (O/T) group which consists of both JTT and operational analysts. As observers, O/Ts provide feedback to the JTF commander and his staff on actions during the exercise. This is accomplished mainly through after-action reviews (at JTF command/principal staff level and action officer/NCO level) and the JTF commander's exercise report. As trainers, O/Ts lead most of the academic training seminars and provide on-the-spot training throughout the exercise. Emphasis is placed on helping JTF members get over their initial growing pains in JTF operations and thereby learn more throughout the drill.

Control Group. The mission of the joint exercise control group (JECG) is to establish and maintain a realistic operational backdrop through simulation, role-playing, and scripts to foster and guide the training audience in meeting training objectives. Under J-72, the JECG staff is formed around a nucleus from various ACOM directorates who have first-hand knowledge of the exercise plan. Other members are drawn from those ACOM components and supporting agencies with the subject matter expertise needed to meet role-player and controller requirements. The First Brigade, 87th Division (Exercises), of the Army Reserve served as the UE '95 interactive OPFOR, a professionally staffed, task-organized unit which can represent the actual capabilities, structure, and doctrine of real world threat forces.

Academic Training. To date a total of 52 warfighting and peace operations seminars have been developed. After evaluations of UE '95 are completed, the seminar outlines and graphics will be made available to all users of the Joint Electronic Library (JEL).

Commands Involved in Unified Endeavor '95

Joint Communications Support Element for UE '95.

U.S. Air Force (Randy S. Mallard)

Command	Training Role	Training Location
U.S. Atlantic Command	CINC	Norfolk, Virginia
III Corps	CJTF	Fort Hood, Texas
CCDG 12	NAVFOR	Portsmouth, Virginia
II Marine Expeditionary Force	MARFOR	Camp Lejeune, North Carolina
III Corps (–)	RFOR	Fort Hood, Texas
8th Air Force	AFFOR/JFACC	Barksdale, Louisiana/Fort Hood, Texas
SOCACOM	JSOTF	Fort Hood, Texas
1st PSYOP Battalion	JPOTF	Fort Hood, Texas
1st Brigade, 87th Division	OPFOR	Birmingham, Alabama

Training Plan. The JTF headquarters mission training plan (MTP) is developed from the universal joint task list (UJTL) which identifies tasks that a JTF headquarters may have to perform from formation of the JTF headquarters to redeployment. The plan was used in UE '95 and the feedback was positive. After coordination with the services and CINCs, ACOM will provide it to the Joint Warfighting Center for inclusion in the joint publications system.

Operating Procedures. ACOM has drafted JTF headquarters standing operating procedures (SOP) for joint operations. Although designed for the ACOM AOR, there was a deliberate effort to make it similar to other SOPs such as EUCOM ED 55–11. The draft was tested in UE '95 and, like the MTP, feedback was incorporated into the SOP to improve it prior to release.

Future Events

JTASC is a state-of-the-art simulation and training center which supports the ACOM joint training mission. It will contain the computer and communication capacity for advanced distributed simulation, distance learning, and video teleconferencing with ACOM components as well as for on-site computer exercises and training. JTASC will provide a JTF commander and his staff with the means to conduct all phases of JTF training in one location using actual C^{4}I facilities in exercise spaces. During a visit to JTASC, the Vice Chairman, Admiral William Owens, noted that "For the first time, the JTASC will allow the commander and all the people who support the joint task force to come together . . . though they were virtually participating together in war." By FY97, JTASC will routinely host two JTF staff training cycles per year, conduct JTF mission rehearsals to support crisis action preparation, and provide simulation support for Tier 2 field training exercises.

UE '95 involved just over 4,000 personnel, half of whom received JTF staff training

The Marine Corps, and specifically II MEF, was the centerpiece of UE '96-1 in late 1995. For UE '96-1, the MEF will provide the commander and the core of the JTF staff for a EUCOM-based scenario, while the 347th Wing from Moody Air Force Base will stand up as the Air Force component to JTF. The details of UE '96–1 are currently under development but promise an even more challenging training period for all concerned. 8th Air Force will participate as the JTF core unit for UE '96–2 in the summer of 1996, just as have III Corps and II MEF.

Value Added

While UE '95 could have been mounted more effectively and efficiently, it cost 95 percent less than Agile Provider (AP) '94 and involved just over 4,000 personnel, half of whom received JTF staff training applicable throughout the world. These officers and service members are just the first in a cadre capable of forming the backbone of any JTF. On the other hand, AP '94 required nearly 45,000 personnel to accomplish many of the same goals with little cohesive JTF staff training. Because of the nature of JTF missions, the ACOM JTF training program is designed to offer comprehensive education across a range of warfighting requirements. This is especially important due to the many and varied regional CINCs who ACOM supports.

The computer model let us specifically focus on several doctrinal issues, including the roles of the joint force fires coordinator (JFFC), Joint Targeting Coordination Board (JTCB), and Joint Munitions Board (JMB). For the first time we incorporated realistic battle damage assessment and the implications of logistics limitations in real time and with good fidelity. Our computer modelling capability will improve significantly when JTASC's full capacity is on-line. Eventually, the facility will offer CONUS-based and possibly even forward deployed forces the full range of exercise and operational rehearsal support for any contingency.

Finally, all the participants agreed that working together as a JTF staff against a "thinking" OPFOR and under realistic conditions was the exercise's greatest benefit. Members of all services learned from each other and confirmed the truth that the American way of war today really is team warfare. As forces shrink and commitments increase, we must take full advantage of joint training to be more effective. As joint force integrator/trainer, ACOM will continue to leverage technology as well as develop new solutions to training problems.

Unified Endeavor '95 demonstrated the challenges as well as benefits of team warfighting. It pushed the envelope of joint operations in ways that confirmed the value of doctrine and tested concepts to improve how we will fight in the future. It focused on the actions of JTF and service component staff members without deploying sizeable numbers of supporting forces. UE '95 was a major step in refining joint training and exercises and making them more effective and efficient. Only team warfare can guarantee the Nation's preeminent military position. JFQ

commentary

JOINT OPERATIONS: The Marine Perspective

By THOMAS C. LINN

No other nation can match our ability to combine forces on the battlefield and fight jointly.

—John M. Shalikashvili

Orchestrating land, sea, and air operations in joint warfare is demanding and contentious at times. Nobody knows this better than the Marines—a joint land-sea-air team. Many contemporary issues regarding the relationship of military arms have been hotly debated within the Marine Corps, in some cases for over half a century. The lessons learned remain relevant today.

Who's in Charge?

Technology in this century provided the tools for joint operations. As Rudolph Winnacker observed, "During the 19th century . . . Army and Navy missions seldom overlapped and . . . such problems as arose in the field had to be resolved in the field. . . ." But after World War I, technological advances, particularly in aviation, expanded service capabilities. Forces in one medium could influence events in another. It was seldom clear whether one service should claim a monopoly in technology. Rancorous debates erupted over which military arm dominated. Today, technology is expanding capabilities faster, and many of the same debates are recurring.

The necessity for unity was recognized in 1935 by the Joint Board, forerunner to the Joint Chiefs of Staff. It published *Joint Action of the Army and Navy* (JAAN) which mandated that one commander would be responsible for joining forces from the services into a joint task force (JTF). Command would be given to an officer from the service with paramount interest in the mission who would assign missions and objectives to component commanders and exercise coordinating control in a given operation. But this joint command would not infringe on the administrative and disciplinary authority of subordinate component commanders. JAAN recognized the separation of joint and service duties and stated that the JTF commander would not interfere with a subordinate commander's conduct of the mission.

The *Marine Tentative Landing Operations Manual* paralleled JAAN. Issued in 1934, it was the foundation of amphibious doctrine—the oldest interservice doctrine. After studying Gallipoli, its authors recognized that such operations could readily founder on jurisdictional authority. Land, sea, and air involvement would inevitably lead to a question of "who's in charge." This situation would be further aggravated by interservice rivalry. Accordingly, it vested command of these arms in one individual—the naval attack force commander—largely because overseas expeditions were seen as extensions of naval campaigns. However, this approach turned out to be an oversimplified solution. The Navy commander did not always have the expertise or interest in operations ashore to perform this role. Still, it was a start in joint operations.

Achieving unity of command is an evolutionary process. Initially, dual-hatted commanders orchestrated military arms. It worked, though not always well. On Guadalcanal, all forces ashore came under the commander of 1st Marine Division, Major General Alexander Vandegrift. Not only did he control 1st Division's subordinate units, but another Marine and two Army divisions, and a collection of aviation units. This entailed integrating air and

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ground operations ashore as well as linking them with those at sea, a major challenge for one commander.

An overarching command structure was developed for operations after Guadalcanal. The Marine amphibious corps presided over ground, air, and logistics units and connected the fleet to operations ashore. The structure was used again by the 1st Marine Brigade (Provisional) early in the Korean War.

achieving unity of command is an evolutionary process

Despite its success, marines argued over the effectiveness of this arrangement. Many believed a division headquarters could do the job. However, air-ground operations became more complex with the advent of the helicopter and also increased lethality of fixed wing aviation. In 1983, the Marine Corps formed permanent command elements for Marine air-ground task forces consisting of ground combat, air combat, and combat service support elements. This recognized that the optimum coordination of military arms is not done on an ad hoc or additional duty basis.

The leading lesson for those who advocate dual-hatting JTF commanders is that joint and service duties are too demanding to be assumed by one headquarters. They must be separated to prevent operational and logistics bottlenecks. JTF command must bridge the strategic and tactical levels. Moreover, orchestrating military arms requires the complete attention of one conductor, an overarching command. In this regard consider the incorporation of sophisticated systems such as JSTARS, AWACS, and AEGIS into operations. In humanitarian assistance military actions must be integrated with the actions of government and nongovernment organizations. Ironically, these lessons were relearned the hard way in Somalia when the Marine expeditionary force commander was assigned as JTF commander. This made the division commander the overall Marine forces commander: Guadalcanal revisited. As a result, the commandant directed on July 1, 1995 the establishment of a deployable JTF headquarters, to be collocated with II MEF at Camp Lejeune.

How Do We Fight?

The coming of amphibious operations was a milestone for joint warfare. It was the first time in history that all three military arms converged on a common point—the shoreline. They readily interacted and mutually supported each other on the tactical level. Naval gunfire and air assisted ground forces in getting to the beach. Once ashore, ground forces secured land bases for aircraft which supported land, sea, and air operations. As Richard Franks wrote of Guadalcanal, "No other campaign in World War II saw such sustained violence in all three dimensions—sea, land, and air." This was largely possible because of technology. It expanded the capabilities of each military arm. While the resulting overlaps cause contention, they are vital to joint operations. They enable the operation's emphasis to transition from one medium to another.

By contrast, consider deep strike proposals that would prevent overlaps and interaction: land forces would fight up to the fire support coordination line, naval forces would stay at sea, and air forces would control everything beyond. This is segregation, not joint operations.

The blueprint for this integration was amphibious doctrine. Initially, the *Tentative Landing Operations Manual* laid out how the military arms would be organized and employed. Moreover, it recognized one constant in joint operations: not only does each operation vary, but each may vary from phase to phase. Mission therefore determines task organization, which also must be flexible to accommodate operational changes indicative of amphibious warfare. Initially, these operations were more naval in character while moving to objective areas. The emphasis shifted as they came ashore. The manual saw the need for task forces comprised of at least two components, a naval support group and a landing force. Within the Marine Corps the fleet marine force was established in 1933 and made up of ground, air, and logistics units from which task organized landing forces were provided to the fleet.

Combining arms at the tactical level is never easy. Components within the amphibious task force were organized functionally. But integrating these functions requires practice and established procedures, especially between ground and air arms, as marines learned on Guadalcanal. Close air support was impeded largely by inadequate command and control. The

Bouganville, 1943.

Naval Historical Center

ground side lacked control measures that were eventually resolved on Bougainville. The air side lacked overall direction—or a joint force air component commander. The air component was a loose collection of squadrons from each service until a marine, Brigadier General Roy Geiger, assumed responsibility for the "Cactus Air Force" September 3, 1942. Yet optimum air-ground operations did not really happen until Marine Air Group 12 supported 1st Cavalry Division's famed dash for Manila in 1945.

Combining arms also means overcoming conceptual differences. Marines have often found themselves in a tug of war over air—sometimes with the Navy but more often with the Air Force. Essentially, the Marines believe that air plays a critical role at the tactical level (and other levels) and should thus be part of a tactical team which enables them to more readily integrate air with other functions. Air and ground marines plan and even execute shoulder-to-shoulder, all playing by the same rules. They also rely upon well-established integration systems, the fire support coordination center system and the air command and control system. At Pusan this teamwork was epitomized by the 1st Provisional Marine Brigade. Often with a 15-minute response time, Marine air strikes devastated North Korean defenses and mobile formations near the critical Naktong River line.

Mogadishu, 1992.

Joint Combat Camera Center

The other side of this tug of war believed that the air function should be centralized on the operational level. Throughout much of World War II, the Navy dominated Marine aviation units. But the more the Navy and Marines operated together, the more control of this function shifted to the landing force, as it did on Okinawa. But between 1951 and 1953 in the Korean War, Marine aviation was centralized under Fifth Air Force. Response times for air support requests took as long as 80 minutes. Only a third of air support sorties were dedicated to ground forces. So bad was this centralized control that the Army X Corps commander, Major General Edward Almond, repeatedly complained and the 1st Marine Division commander, Major General Gerald Thomas, refused air support unless it was provided by the Marines.

joint attempts to replicate tactical organizations could be disastrous

The lesson for JTFs is that organizing by functions is easy while integrating functions is hard. It requires more than doctrine. It takes practice and time-tested procedures, especially on the tactical level—the foundation for higher level operations. The services have already created tactical organizations for this purpose. Their integrity should be preserved when incorporated into JTFs, each of which, after all, is a system of systems—an operational level organization. Joint attempts to replicate tactical organizations such as initial adaptive joint force packaging deployments could be disastrous.

On the operational level, JTFs have shown that they can organize functionally, which was arguably the case on Okinawa. The commander of X Army was overall landing force commander (or joint force land component commander) with the marines of III Amphibious Corps reporting to him. This worked because tactical aviation was integral to the organization, and tactical measures for its integration remained in place. But in Korea, functional organization did not work and this tactical integrity was denied.

Operations will vary, which makes joint organization situation-dependent. General Dwight Eisenhower used a functional organization in North Africa after January 1943 which consisted of Allied Naval Forces, Allied Air Forces, and Allied Ground Forces. In Europe, he discarded strict trilateral organization for functional or area organizations: army groups (south, center, and north); tactical air forces (1st, 2d, and 9th); naval, airborne, and logistics components; and two strategic air components. Finally, functional organization requires experienced participants. Sometimes for the sake of expediency it is easier to organize JTFs by service component.

Joint operations are never easy. However, we have learned many lessons. Interestingly enough, very few rules apply. First and foremost, one person must be in charge and this should be a primary duty. Second, tactical organizations are inviolate; they must serve as building blocks. Third, the one constant is that each operation is different, and so is its organization. Flexibility, not rigidity, is a virtue. If we ignore these lessons, we make joint operations much harder. **JFQ**

Joint Force Quarterly

ESSAY CONTEST ON THE

Revolution in Military Affairs

To encourage innovative thinking on how the Armed Forces can remain at the forefront in the conduct of war, *JFQ* is pleased to announce the second annual "Essay Contest on the Revolution in Military Affairs" sponsored by the National Defense University Foundation, Inc.

The contest solicits innovative concepts for operational doctrine and organizations by which the Armed Forces can exploit existing and emerging technologies. Again this year, those essays that most rigorously address one or more of the following questions will be considered for a cash award:

▼ The essence of an RMA is found in the magnitude of change compared with preexisting warfighting capabilities. How might emerging technologies—and the integration of such technologies—result in a *revolution* in conducting warfare in the coming decades? What will be the key measures of that change?

▼ Exploiting new and emerging technologies is dependent on the development of innovative operational concepts and organizational structures. What specific doctrinal concepts and organizations will be required to fully realize the revolutionary potential of critical military technologies?

▼ How might an adversary use emerging technologies in innovative ways to gain significant military leverage against U.S. systems and doctrine?

Contest Prizes

Winners will be awarded prizes of $2,000, $1,000, and $500 for the three best essays. In addition, a special prize of $500 will be awarded for the best essay submitted by an officer candidate or a commissioned officer in the rank of major/lieutenant commander or below (or of equivalent grades). A selection of academic and scholarly books dealing with various aspects of military affairs and innovation will also be presented to each winner. JFQ

Contest Rules

1. Entrants may be military personnel or civilians (from the public or the private sector) and of any nationality. Essays written by individual authors or groups of authors are eligible.

2. Entries must be original and not previously published (nor under consideration for publication elsewhere). Essays that originate from work carried out at intermediate and senior colleges (staff and war colleges), service schools, civilian universities, and other educational institutions are eligible.

3. Entries must not exceed 5,000 words in length and must be submitted typewritten, double-spaced, and in triplicate. They should include a wordcount at the end. Documentation may follow any standard academic form of citation, but endnotes rather than footnotes are preferred.

4. Entries must be submitted with (a) a letter clearly indicating that the essay is a contest entry together with the author's name, social security account number (or passport number in the case of non-U.S. entrants), mailing address, telephone number, and FAX number (if available); (b) a cover sheet containing the contestant's full name and essay title; (c) a summary of the essay which is no more than 200 words; and (d) a brief biographical sketch of the author. *Neither the names of authors nor any personal references* should appear in the text (including running heads).

5. Entries must be mailed to the following address (facsimile copies will not be accepted): RMA Essay Contest, *Joint Force Quarterly*, ATTN: NDU–NSS–JFQ, Washington, D.C. 20319–6000.

6. Entries must be postmarked no later than August 31, 1996 to be considered in the contest.

7. *JFQ* will hold first rights to the publication of all entries. The prize-winning as well as other essays entered may be published in the journal.

8. Winners' names will appear in *JFQ* and prizes will be presented at an appropriate ceremony in Washington, D.C.

The Impact of NATIONALISM ON JOINT FORCE PLANNING

By GEORGE W. PRICE

Nationalism has emerged as a powerful force in the post-Cold War world. Far from the *end of history* as presaged by Francis Fukuyama, there has been a return to history in gory detail. In much of Africa and Asia the contest between the two superpowers was a convenient mechanism for garnering economic aid and security assistance at a discount, but it was largely irrelevant in the context of regional politics. For example, in the Middle East, Arab/Israeli differences continued to fester independently of the superpowers, which became patrons of the opposing sides.

Perhaps the most dynamic changes have taken place in areas once dominated by the Soviet Union. Germany has been reunited, the Baltic states have reappeared, and numerous new nations, most without any independent existence in the modern era, have been established. In Yugoslavia, a bloody war has carved states out of a multiethnic nation. Similar changes are occurring around the world. Palestinians are negotiating with Israel for an autonomous state. U.N. forces protect Kurds in northern Iraq. In Africa, tribal differences threaten to reshape the political landscape from Liberia to Somalia. Even in Western Europe, traditional Flemish/Walloon friction has been revived in Belgium while Basque separatists continue to harass the Spanish government.

the end of the Cold War restored a multipolar world increasingly driven by nationalist rivalries

Thus nationalism has reemerged as a critical factor in restructuring the international political scene in the post-Cold War era. Understanding the dynamics of nationalism will remain critical to regional security affairs and joint force planning.

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Planning Implications

Tension results from the struggle between two important contending forces in international politics, a political structure that equates the sovereign state with the highest form of organizational entity, and the desire of ethnic groups to establish and protect their national identities. Because the world has 183 sovereign states there is very little territory for new ones. Consequently, as ethnic groups seek to create national identities they compete with existing states, which is a major cause of international instability. During the Cold War this dynamic was not appreciated, largely because of the bipolar nature of international relations. Lesser powers cooperated in varying degrees with the United States or the Soviet Union. But the reality was more complex. Rather than remaining bipolar, with the expectation that a unipolar international system would later emerge, the end of the Cold War restored a multipolar world increasingly driven by contentious nationalist rivalries.

This trend is seen in the collapse of empire and reemergence of national components from within. The Soviet Union fragmented into fifteen

nations. Yugoslavia broke into three with a fourth still evolving. This duality between self-determination and sovereignty has become a fundamental source of instability in international politics. It forces international actors to balance aspirations of national groups against the reality of an existing structure of recognized sovereign states. Joint planners who look at regional crises must wrestle on the horns of this dilemma.

National Struggles

The world is replete with examples of the quest for national status run amok. Oppression of minority rights is often the first restriction on emerging ethnic national groups. This includes outlawing native language, discouraging trade, and even relocating minority groups. Numerous cases of repression of minority rights exist in Africa and Asia as competing ethnic national groups seek power. In Burundi, majority Hutus are locked in sporadic conflict with minority Tutsis. The assassination of President Doe of Liberia pitted his ethnic Krahn group in a civil war against the rebel Charles Taylor whose supporters are primarily ethnic Gio and Mano. In Bhutan thousands of ethnic Nepalese have suffered under government oppression. In Indonesia long-term repression in East Timor has resulted in the death of nearly a third of a population of 600,000.

The second manifestation is the creation of refugee populations. The Arab-Israeli dispute is one example. Jewish refugees from World War II, in the spirit of Zionism, fueled the creation of the state of Israel in 1948. The end to their Diaspora, however, began one for Palestinians, who were driven from their homes and ultimately resettled in U.N.-sponsored camps. Recently, the horrors in Yugoslavia have generated a million refugees, not only Moslems, but also Croatians and Serbs, as each group seeks the safety of its fellow nationals.

Terrorism is used as a tool by national groups which are frequently disaffected minorities. Not only Zionist and Palestinian organizations engage in terrorism; such action is employed around the world to garner publicity for national movements. The Provisional Irish Republican Army, for example, has no consistent program to drive the British out of Northern Ireland, but the bombing campaigns in both Ulster and Britain have demonstrated the virulence that moves nationalist groups to indiscriminate acts of violence.

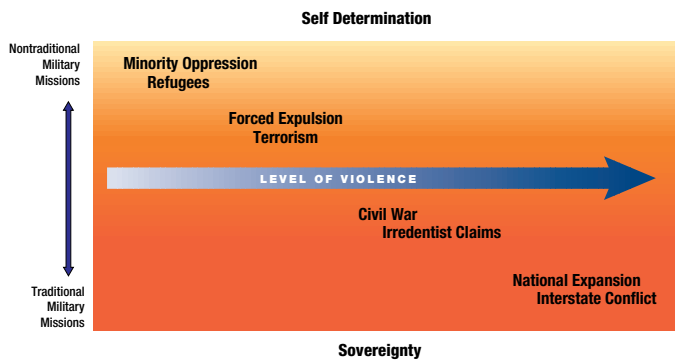
Forced expulsion (repatriation) is another tool used by majority national groups to eliminate or adjust population boundaries. Stalin used this to control national minorities in the Soviet Union. Volga Germans were relocated thousands of miles from their homes to ensure that they would not create a fifth column in support of the Nazis during World War II. Russians were moved into the Baltic states and Balts were moved out to the eastern Soviet Union. Stalin used similar relocations to blur national identities. Following independence in India and Pakistan hundreds of thousands of people moved from one nation to the other to avoid becoming minorities in the new national entities that replaced the rule of the British raj. Such actions have tremendous individual costs as well as economic and social consequences, and they are not necessarily successful as is evidenced by the continued friction between India and Pakistan.

Highly organized ethnic nationalist groups may resort to civil war to establish their claims. In the late sixties an effort by the Ibo minority of Nigeria failed to establish Biafra as a new state. The current constitutional crisis in Nigeria suggests that renewed ethnic conflict could occur in the most populous nation in Africa. Bosnia is the best contemporary example of a civil war between rival national groups, Bosnian Moslems and Bosnian Serbs. Because of the intense ethnic hatreds, an agreement eluded diplomats for years during which time human suffering grew steadily worse.

Irredentist claims serve as a means for outside nations to support conationals who live as minorities in other states. The war between the Soviet successor states of Armenia and Azerbaijan illustrate this problem. The Armenian enclave of Nagorno-Karabakh inside Azerbaijan has become a source of conflict. Because Azerbaijan does not share a border with Armenia, either supporting or annexing this territory has been impossible. Instead, using Soviet arms, each side has sought to break the will of the other through military action. The result has been an effective destruction of the territory with no resolution by the groups involved. The Armenians are seeking access through a narrow corridor to create a territorial linkage which has not been achieved by force or diplomacy.

The Soviet breakup offers similar opportunities for irredentist claims, the most important of them involving Russians left in newly established states. Significant Russian minorities remain in the new Baltic states whose policies regarding minority rights are not encouraging. Estonia, for example, has enacted measures that have an adverse impact on the remaining Russian population. These especially pertain to use of the Estonian language and rights to employment, schooling, and public services. Formerly the majority in the Soviet Union, the Russians resent such changes; yet they continue to view the land where they have lived for generations as their home. This may lead to pressure for Russia to intervene in support of its conationals, who have become a minority.

Division between Issues



Similar problems exist in Eastern Europe. Hungarian minorities in the Transylvania region of Romania have been a source of friction since the Treaty of Trianon after World War I awarded this primarily Hungarian region to Romania. Hungarian minorities in the Vojvodina portion of Serbia represent another possible irredentist claim for Budapest. Thus far the Hungarians have not been caught up in the ethnic conflict between the Serbs and Croats, who are their neighbors. But if conflict resumes and Vojvodina is involved, Budapest may act to protect the Hungarian minority.

Often expansionist conflicts are justified as efforts to regain territory to which nations have historic claims. Iraq's invasion of Kuwait was rationalized on such grounds. The Iraqis appealed to British colonial maps that dated to World War I. A resurgence of Russian nationalism may lead to the use of force to reclaim territories lost after the collapse of the Soviet Union. Claims against weak states like Tadjikistan or Georgia might succeed absent a response from the international community. Military action to regain Ukraine may be more difficult, given the size and resources of that new nation and its solid national identity. Macedonia is another state that could disappear as a result of Serb, Greek, or Bulgarian claims to portions of its territory.

much instability can be explained in terms of ethnic nationalism

Finally, interstate conflict can be driven by national rivalries. The Indo-Pakistani conflicts of the Cold War and the Chad-Libya border dispute are examples. Serbia and Croatia have settled into an uneasy truce resulting from exhaustion and the diversion of the war in Bosnia. The conflict could reemerge as both parties reassess their relative positions. In the Middle East, rivalry between Israel and its neighbors is another case of interstate conflict driven in part by ethnic nationalism.

Much of the instability that arose in the post-Cold War world can be explained in terms of ethnic nationalism and competing groups which are asserting their power and authority. Coming to terms with these dynamics will challenge joint force planners into the next century.

Responding to Nationalism

Joint force planning recently has been entangled in nationally derived conflicts. Operations Desert Shield/Desert Storm responded in part to national expansion. The U.N. Protection Force (UNPROFOR) went to the Balkans in 1992 to check a conflict between Serbs and Croats, and the NATO Implementation Force (IFOR) now has been deployed in Bosnia under the Dayton accords. The accompanying figure lists traditional missions and nontraditional missions on a vertical axis. The former refer to warfighting and related operations while the latter refer to areas of humanitarian assistance, civic action, and low intensity conflict that were peripheral concerns to planners during the Cold War. The broad red band indicates the divide between self-determination and sovereignty that creates a conceptual firebreak. It suggests that ethnic national conflict can be categorized into (1) early efforts at self-determination, (2) a murky level of direct challenges to sovereign states by ethnic national groups, and (3) conflict arising among sovereign states over ethnic national issues.

The interaction below the band in the figure occurs between sovereign nations. This type of conflict is easily understood since the alternatives are relatively clear cut. Whether to intervene and which state to support remain difficult decisions. It means siding with one national element or another. In the Gulf War, the United States and most other nations supported Kuwait over Iraq. This type of conflict tends to have straightforward post-conflict objectives. The main objective in the Gulf was restoration of Kuwaiti sovereignty.

Such conflicts will not present serious planning problems in the future. The current major regional contingencies (MRCs) on which the United States has decided to focus are of this type. The first sees Iran or Iraq seeking to establish itself as regional hegemon in Southwest Asia. These actions fit the category of wars of national expansion and interstate conflict described above. The second focuses on the Korean peninsula. Here, two sovereign states are competing to represent the national will of the Korean people. Other possible conflicts of this type, such as a war between Russia and Ukraine, pose significant resource implications for joint planners but do not represent serious conceptual challenges in terms of traditional planning.

Combat Camera Imagery (Theodore J. Koniarea)

DOD

Similarly, actions above the band are relatively well understood. U.S. Special Operations Command has hundreds of individuals involved in humanitarian assistance operations worldwide. They provide low level, nonintrusive support to improve the professional skills of foreign military organizations. Similar objectives are achieved by the international military education and training (IMET) program. The Coast Guard conducted operations in the Caribbean to deal with refugees from Haiti and Cuba. During the Cold War the Armed Forces helped thousands of Hungarians who fled after the 1956 uprising. The U.N. High Commissioner for Refugees also has provided international experience in dealing with these problems, primarily in Israel and Palestine as well as in India and Pakistan. Although they pose challenges to execute, such operations do not represent a major departure. Thus, the military must be equipped to plan and execute operations involving ethnic conflict at the extremes of the self-determination/sovereignty axis.

Joint force planners have the greatest difficulty dealing with ethnic nationalism in the murky area where efforts to achieve self-determination run into direct conflict with established sovereign states. This is because of the fundamental dichotomy between nation and state in the international political system. It is in this arena that forced expulsions, terrorism, and civil wars occur. While international norms recognize the right of self-determination, it is only when these efforts succeed and the ethnic national group

achieves sovereign statehood that the international community can deal with a new nation. It is precisely this unease that exists in Provide Comfort in northern Iraq, which has protected the Kurds from the Iraqis and enabled them to return home. However, it has not supported Kurdish efforts to establish a sovereign state that would reach across the borders of Iran and Turkey. In addition, planners have responded to refugee flows resulting from oppression of minorities, including the exodus after the victory by the Tutsi minority in the Rwandan civil war where foreign troops had to deal with more than a million Hutu refugees.

Projecting Neutrality

The bombing of the Marine barracks in Beirut showed the difficulties which foreign troops face when they are identified as taking sides in ethnic nationalist conflicts. Lebanese Moslems saw American forces as supporting the Christian dominated Lebanese forces. Clausewitz declared that a commander must understand the type of war he is engaged in and *not* make it something it is not, advice which is critical in ethnic conflict. Decisionmakers can agree to deploy forces in a neutral fashion but in practice this is achieved rarely if at all. International forces may try to achieve that goal, but those with whom they deal may not allow them to play a neutral role. General Aideed did not view U.N. forces as impartial in the struggle among rival Somali warlords, and Bosnian Serbs did not see UNPROFOR as neutral during the siege of Sarajevo. When a decision is made to use military means in ethnic national conflicts, planners should insist that any mission statement clearly reflect whether forces should support the sovereign state or protect efforts by a minority to achieve self-determination. Plans designed only to reduce violence or suffering are doomed to fail.

it is virtually impossible for forces to be both effective and neutral

The initial success of Restore Hope in Somalia and Desert Storm in Iraq demonstrate that the Armed Forces can undertake such ventures successfully. It is virtually impossible for forces placed in such situations to be both effective and neutral. If the decision is made to employ military forces in terrorist, civil war, or irredentist types of conflicts, the forces should go in with a clear mission statement. Choosing sovereignty or self-determination compels decisionmakers to have a clear objective when employing military forces.

To cope with post-Cold War challenges, joint force planners must understand the dynamics that are transforming the international order. A new qualitative assessment is necessary to plan for the future. The resurgence of ethnic nationalism helps explain changes in the international political system. In the wake of the collapse of the Soviet empire and turmoil generated in Asia and Africa by the residual arbitrary impact of colonialism, the basic organizational structure will be that of the ethnic nation. Moreover, this ethnic nationalism will seek to establish itself through sovereignty. To the extent that this process is not peaceful—and it normally is not—the United States and other nations seeking to encourage peaceful change will be challenged to intervene. This will necessitate some type of military operation, often in combination with diplomatic and economic actions.

Depending on the level of conflict, a decision to respond can be relatively straightforward. If sovereign states use force, the international system has established mechanisms with which to respond. But when situations fall into the area generally regarded as the internal affairs of nation-states, planning becomes more complex. But even there, military forces offer various options such as education and training, humanitarian assistance, blockades to support economic sanctions, and antiterrorist capabilities to redress crises which result from the excesses of nationalists. This is not to suggest that outside intervention is required in all disputes. Far from it. That would greatly exceed available defense and economic resources, not to mention the political will, of any major power.

Understanding ethnic nationalism allows for prioritization within a common framework and demonstrates that not everything has changed. Many operational capabilities of the Armed Forces are well suited to the challenges of ethnic nationalism along the sovereignty/self-determination axis, from humanitarian relief on one hand to conflict between sovereign states on the other. It is in the gray area where ethnic national groups threaten existing states that both planning and operational difficulties occur. Civil wars, terrorist acts, mass expulsions, and irredentist claims are complex problems in which competing ethnic national groups represent diametrically opposed viewpoints. U.S. forces cannot operate effectively on a tightrope between the two. Planners must incorporate mission statements supporting one objective or the other, not necessarily exclusively, but in terms of operational objectives that can be achieved by the military. Anything short of that places such forces, either national or international, in an untenable position. **JFQ**

New Forces for Engagement Policy

By WILLIAM W. MENDEL

The premise of U.S. strategy is that we must counter an array of challenges to our interests: the proliferation of weapons of mass destruction (WMD), regional conflicts, militant nationalism, deterioration of political and economic reform in the former Soviet Union (FSU), and transnational (gray area) phenomena such as terrorism, warlordism, refugees, narcotrafficking, environmental crises, and famine. Our national security strategy emphasizes transnational threats to nation-states by non-state actors as well as non-governmental processes and organizations which are viewed by many analysts as far more probable than general war involving WMD.

Additional challenges are weapons proliferation (including black market transfers of nuclear material or WMD by rogue states, terrorists, or criminals), conflict over resources, environmental issues, spread of serious diseases, transnational links of drugtrafficking and other criminal activity with terrorism and insurgency, illicit electronic capital movement, illegal immigration, and areas in megacities and the countryside where government control has eroded. Unconstrained by borders and international protocols, such dangers threaten nation-states used to state and alliance systems. But our doctrine and force structure are based on concepts of overwhelming force to achieve decisive victory against states—hardly a formula for coping with these new threats.

global engagement is a core belief in our national security strategy

Collective Decisionmaking

The linkage of the active engagement vision and the extended range of security threats is a shift of emphasis in defending the Nation. In January 1993, for instance, the Bush administration stated in the *National Security Strategy of the United States*:

Foremost, the United States must ensure its security as a free and independent nation, and the protection of its fundamental values, institutions, and people. This is a sovereign responsibility which we will not abdicate to any other nation or collective organization.

By contrast, the Clinton administration's national security strategy provides different guidance:

The U.S. government is responsible for protecting the lives and personal safety of Americans, maintaining our political freedom and independence as a nation, and providing for the well-being and prosperity of our nation. No matter how powerful we are as a nation, we cannot secure these basic goals unilaterally. . . . Therefore, the only responsible U.S. strategy is one that seeks to ensure U.S. influence over and participation in collective decisionmaking in a wide and growing range of circumstances.

Thus global engagement is a core belief in our national security strategy. It portends the criticality of effective military interaction in multiagency and multinational operations. Events will show how closely the administration follows these policy guidelines. Certainly there has been disillusionment with the United Nations since the Somalia debacle. On the other hand, American leadership sought U.N. rather than congressional support to enter Haiti by force.

Peacetime Military Roles

How will the military instrument be used to support national security strategy? The goals of sustaining security interests and promoting democracy abroad suggest a wide range of military roles. These goals and related military objectives will be achieved mostly by overseas presence and operations other than war (OOTW). The Nation will maintain the forces to win two nearly simultaneous major regional contingencies (MRC) in concert with regional allies. It will engage in

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Amphibious assault, Agile Provider '94.

U.S. Navy (Robert N. Scoggin)

Searching for weapons in Haiti.

Combat Camera Imagery (Val Gempis)

arms control, nonproliferation, and counterproliferation. It will retain strategic nuclear forces sufficient for deterrence. Engagement around the world will involve overseas presence, disaster relief, fighting terrorism and drug trafficking, conducting peace operations, and providing nation assistance to counter insurgency, lawlessness, and subversion.

To promote democracy abroad, the United States will assist countries that affect its security interests, such as those with large economies, critical geostrategic locations, nuclear forces, and the potential for refugee flows. Russia and the states of Central and Eastern Europe are examples, as are the democracies of the Asia-Pacific region. Given these roles, are the Armed Forces structured to support the national security strategy? This is an important consideration since, before a national security policy was formulated, the Pentagon had determined a force structure for the next century. The process used to define that force, however, was not carried out in a vacuum.

During the summer of 1993—one year before the administration issued a national security strategy—then Secretary of Defense Les Aspin conducted the *Bottom-Up Review* (BUR) to define force structure, modernization programs, industrial base concerns, and the infrastructure to counter new dangers.

How well does the BUR recommendation match the President's national security strategy? Can it counter such diverse perils as WMD, regional war, deterioration in the former Soviet Union, and transnational (gray area) phenomena?

Strategic Forces for New Threats

Deterrence, nonproliferation (prevention with political and economic instruments backed by force), and counterproliferation (efforts to combat proliferation) are WMD concerns. The Nation is reducing its nuclear arsenal under the START treaties, but the process will take a decade, assuming it stays on track. Given the uncertainty

in Russia, Kazakhstan, and Ukraine, and the potential for unfriendly nuclear states in other regions, programmed strategic force seems necessary and capable of its deterrence and warfighting missions—at least in the traditional sense. However the utility of strategic forces for deterrence has been diminishing as suggested by the advocates of a revolution in military affairs (RMA) which stresses dramatic effects of new military and civilian technologies. The consequences of RMA, such as information and intelligence dominance, nonlethal weapons, and precision standoff strike systems, may offer more for deterrence and countering proliferation than strategic forces and, in turn, may lead to the marginalization of nuclear weapons.

It is not clear how strategic nuclear forces will affect WMD use by rogue states with little to lose or terrorists and international criminal groups. It has also been suggested that proliferation is all but inevitable and the task is to hedge against increased risks and exploit available opportunities. Another challenge is counterproliferation, which is aimed at controls on fissile material, increased support for inspection teams under the International Atomic Energy Agency, intelligence to locate and destroy nuclear weapons programs, and forces to operate against a WMD-armed enemy.

U.S. forces are more likely to be involved in operations short of declared or intense war

U.S. strategic forces are not capable on their own of countering proliferation and the kinds of gray area threats seen today. This requires new concepts for using technology, intelligence, and units specially trained to operate in a cooperative multiagency and international environment. One place to look for new capabilities may be in the conventional force structure advanced in BUR.

The force structure recommended in the *Bottom-Up Review* for funding in the future year defense program (forces extant in 1999) was designed by the current administration to sustain two nearly simultaneous major regional contingencies, peace operations, overseas presence operations, and operations to counter gray area threats, although not all simultaneously. The need for a force structure to fight two MRCs nearly simultaneously has been challenged. Holding forces in reserve to deter a second regional threat does not square with our experience in Korea, Vietnam, and Iraq, which were one-war events. Moreover, the two-MRC force may not be structured to leverage new technologies and concepts to counter the global dangers as stressed by RMA.

A conventional war with Russia is now virtually inconceivable since its military is in great disarray and represents little threat to the United States and its allies. America is not well equipped to tackle instability or gray area phenomena inside FSU, but these are possible threats to stability. Should the failure to reform result in a breakdown of the Russian or an East European government, the scope of a relief effort may be too large for the Western allies. Military operations other than war (such as Bosnia) will be the most likely application of U.S. military resources. It makes little sense to send combat divisions and air wings, but who else would do the job?

Danger in the Gray Areas

While general purpose forces are designed for warfighting, the military instrument of national power must be appropriate for countering transnational threats and gray area phenomena. The administration has stated that its emphasis on engagement, prevention, and partnership means that U.S. forces are more likely to be involved in operations short of declared or intense war. But in spite of repeated use of conventional force structure and doctrine to accomplish such missions, there have been few clear successes, as our experiences in Panama and Somalia have illustrated.

Panama provided an opportunity to employ overwhelming force to achieve decisive victory which culminated in the apprehension of Manuel Noriega. Perhaps American military leaders were captives of the traditional conflict paradigm: that is, reliance on correlation of forces and firepower, faith in technological solutions and quantification, need for an eminent cause, and thinking that war suspends politics. In Somalia, U.S. forces led Unified Task Force (UNITAF) to provide security for the delivery of aid and transferred command to U.N. Operations for Somalia (UNOSOM II) to help peace enforcement create stability. The mixture of forces and international, interagency, and nongovernment organizations, each with its own viewpoints and operating methods, contributed to operational risk and the eventual erosion of political will to support the Somalia mission.

Finding the proper blend of doctrine, strategy, and forces for military operations other than war is fundamental to engagement and enlargement. But as Secretary Aspin advised about forces for peace operations, "these capabilities could be provided largely by the same collection of general purpose forces needed for MRCs, so long as the forces had the appropriate training." This conflict paradigm got the United States in trouble in Southeast Asia. The Army pursued counterinsurgency in 1965–66 by deploying combat formations to destroy North Vietnamese divisions and

main force Viet Cong units. The American military worked from the top down, while communists conducted a range of social, political, and military actions from the village level up. When asked to explain their operations, U.S. officers gave the textbook answer, to close with and destroy the enemy.

At a Crossroads

A national security strategy of engagement and enlargement demands forces and concepts for OOTW, but the force is said to be designed for fighting two MRCs. The global environment of transnational threats and gray area phenomena already challenge U.S. interests. Can our military capabilities to meet these dangers be improved?

Civilian agencies cannot handle OOTW tasks because they lack organizational and logistical assets for large-scale operations, especially when security is a dominant concern. Moreover, they clearly cannot exercise the upper hand in contested situations when ascendant military power is needed. In the gray area environment it is not always clear where civilian responsibilities end and military tasks begin. Once again it is time to address the doctrine and force structure for supporting national security policy. What kind of forces could help to counter WMD proliferation, incipient causes of regional war, aspects of instability in FSU, and transnational phenomena?

a few uniquely organized units could train for long-term and indirect approaches to achieving U.S. objectives

One answer is a standing military staff for OOTW. If we intend to enhance participation in collective decisionmaking in a growing range of circumstances, a specially organized joint planning staff is needed with apportioned forces to optimize military support of security policy. A joint command should be trained and ready to join with government, non-government, and international organizations in tackling transnational threats or supporting OOTW tasks. The permanence of such a command could develop expertise on the interagency and international environment. Ready to go into action unilaterally or with partners, it could add a new dimension of deterrence to conflict short of war. While such a specially designed force might detract from the conventional force structure, it would be cost-effective for engagement strategy. Significantly, it will protect the readiness of conventional combat forces by relieving them of most OOTW missions.

To support engagement strategies, a joint command should be established on a functional basis without regard to a specific geographic area of responsibility. Its headquarters would include liaison representatives from interagency, private, and non-government organizations. It would be tasked to support regional CINCs with JTFs trained and deployed according to regional strategies. Such a joint engagement command (JEC) located in the United States would either report directly to the national command authorities or serve as a subunified command of U.S. Special Operations Command. It could operate in an international and multiagency environment by virtue of its access to the joint planning community, multiservice design, and unique mission. Joint Pub 3-08, which addresses interagency coordination, points to the need for a functional command for engagement.

This standing joint force would be organized functionally to integrate diverse capabilities of the services. The Reserve components would play a major role: for example, a nation assistance element would include engineer, medical, and civil affairs assets, all areas of Reserve expertise. Security police also would contribute to joint force operations as well as training assistance to host nation military and police units. Logistics and transportation assets would provide air and ground transportation and a staff deployment planning function, and signal assets would support command and control for multiple deployments around the globe. A security assistance organization would oversee military support to CINC security assistance initiatives. Finally, a special mission element would be largely built around special operations forces with additional psychological operations and military intelligence units. Each service would share the burden by providing forces.

Some JEC missions would need combat units to provide force security, maintain escalation dominance, or even close with and destroy enemy forces. For this reason, joint force packages of combat units could be apportioned by the Joint Staff for planning and operations with JEC.

This is not an issue of creating more force structure, but of better organizing what is now on hand. There are advantages of a joint force for peacetime engagement operations. It would free conventional units from tasks which degrade combat readiness. The units apportioned to JEC for planning and deployment would be mainly support units that could quickly be reassigned to a force deployment troop list for an MRC. While assigned units would train to meet command standards for joint mission essential tasks, units in functional commands would not have to be situated with a joint headquarters. Primary task lists would support peacetime engagement operations, but JEC units would be available for conventional contingency operations. By assigning

U.S. Air Force (Lynn Walters)

U.S. Navy (J.P. Guzman)

Destroyers off San Clemente Island.

specific units to the command, other service units would be free to concentrate on conventional combat training.

JEC would go a long way toward solving a long-standing problem: the American proclivity for satisfying political decisions by using conventional forces to produce effects that are foreign to them. Under JEC, a few uniquely organized units could train for missions requiring long-term and indirect approaches to achieving U.S. objectives. The Armed Forces could remain unbedeviled by OOTW missions, free to concentrate on training for decisive battles of annihilation.

Among the most critical dangers facing the United States are gray area phenomena such as conflicts over scarce resources, ethnic and religious conflict, transnational crime (with its linkage to terrorism and insurgency), migration and illegal immigration, famine, and nations on the verge of collapse. But the military instrument of national power will not be effective in countering these threats if the traditional way of war is applied to OOTW. This is not the time to discard Clausewitz and the operational art, but there is room for innovation in structuring forces for the 21st century. Perhaps RMA will offer opportunities not only through technological innovation but also through new operational concepts and organizational adaptation. Success in operations other than war will depend on adjusting to the new security environment. One certain catalyst for change would be the creation of a new military organization for engagement operations—a joint engagement command. The Armed Forces may then be able to advance beyond new technologies for fighting old wars, to reshape our doctrine and force structure for engagement and enlargement. **JFQ**

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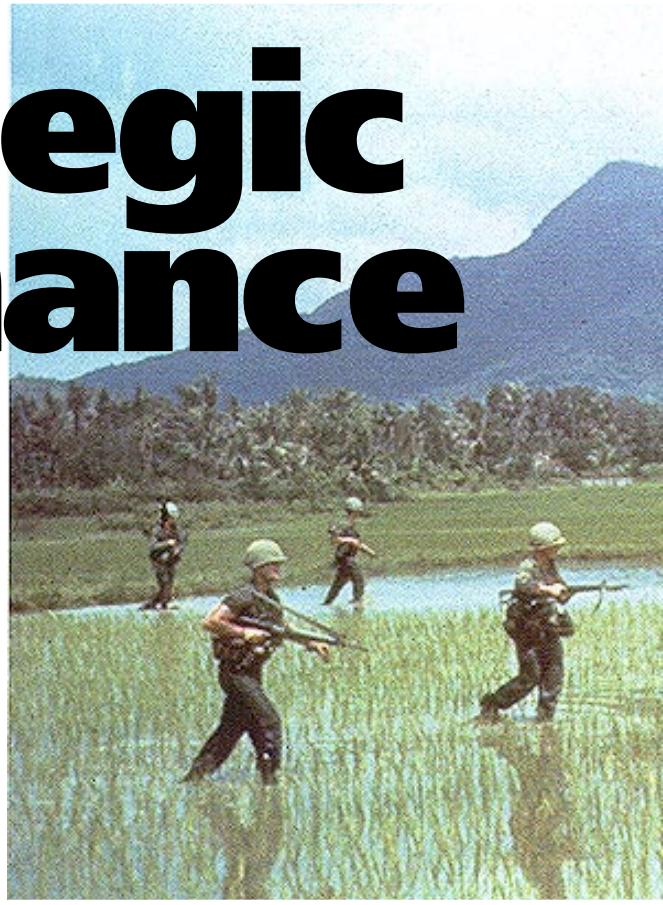
On Strategic Performance

By COLIN S. GRAY



It has become almost a commonplace to observe that in the two world wars of this century the Germans proved to be good at fighting but not very good at waging war.[1] A similar judgment applies to the French and American experiences in Indochina. One of the better works on the latter concluded that the plight of the United States "was a failure of understanding and imagination. American leaders did not see that what for them was a limited war for limited ends was, for the Vietnamese, an unlimited war of survival in which all the most basic values—loyalty to ancestors, love of country, resistance to foreigners—were involved."[2]

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Lyndon Johnson, Robert McNamara, and William Westmoreland—to name but three of the more culpable parties—neither read nor understood, let alone adhered to, the wisdom of that long dead Prussian soldier-theorist, Carl von Clausewitz, who wrote:

The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish by that test [of war as an instrument of policy] the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into, something that is alien to its nature. This is the first of all strategic questions and the most comprehensive.[3]

He also advised:

No one starts a war—or, rather, no one in his senses ought to do so—without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it. The former is its political purpose; the latter its operational objective.

This is the governing principle which will set its course, prescribe the scale of means and effort required, and make its influence felt down to the smallest operational detail.[4]

DOD

Paddy fields of Vietnam.

In the cases above, somewhat inchoate visions of what was politically desirable inspired scarcely more orderly sets of high policy goals which had to serve as dim and swaying guiding lights for military effort. In each, political ambition exceeded the military means and the strategic skill available. Germany, France, and the United States lacked the myriad assets necessary for an approximation of political success. Whether or not a plausible facsimile of victory was attainable in any of these cases is distinctly debatable. What is not in question is that the countries involved all faltered strategically. Each failed to wage war in such a manner or to such a degree that the more important of its policy goals were secured.

strategy is the meaning of what forces do for the course and outcome of a conflict

One should be sensitive to, but not cowed by, the charge that too much is revealed through hindsight. Also, it is not to be denied that much in the history of U.S. statecraft is strategically admirable. America's victory in the Cold War was a success for strategy of which any polity could be proud. Although there is usually more to be learnt from failure than success, one should not be biased in favor of the study of failure. Moreover, even when failure dominates the page, one must seek empathy with the people and organizations committed to generate strategic effectiveness in the face of real-world friction. Indeed, it is the very difficulty of providing consistently high strategic performance that yields much of the interest in this subject. If scholars are to have anything to say that merits attention in the world of practice, they must understand the constraints of that world.[5]

The Meaning of Strategy

The virtue of Clausewitz's definition of strategy is that it is crystal clear on the distinction between its subject and other matters. Specifically, strategy is "the use of engagements for the object of the war." Having defined tactics as "the use of armed forces in the engagement,"[6] the distinction could hardly be more clear. Without exception, well meaning attempts to improve upon Clausewitz's definition of strategy have not proved successful.

For example, a well regarded military theoretician, writing in a no less well regarded series of quasi-official textbooks, invites acceptance of "strategy as the planning for, coordination of, and concerted use of the multiple means and resources available to an alliance, a nation, a political group, or a commander, for the purpose of gaining advantage over a rival."[7] The theorist at fault here seems not to appreciate that there is merit in parsimony, that clarity in definition depends on an uncluttered identification of the claimed essence of the subject at issue, and that speculation on the purpose of the subject is irrelevant at best and misleading at worst. His definition is not without some merit, but quite needlessly it muddies water that was clear in its Clausewitzian formulation. Beyond argument, that definition is not an improvement on Clausewitz.

Nonetheless, that definition shines by comparison with one offered by Martin van Creveld which is rather casual and distinctly unhelpful. He speaks of "strategy, the method by which those armed forces [the military organization created by the state] wage war."[8] Lest there be confusion, "the method by which those armed forces wage war" is the realm of tactics or even of doctrine. Doctrine is guidance on how to fight, tactics is what forces do, and strategy is the meaning of what forces do for the course and outcome of a conflict.

What may be called the *strategy test* applied to behavior reduces usefully to the question "so what?" Tactical discussion should focus on what force, or the threat of force, did or might have done. Strategic discussion, by contrast, should consider what difference the use, or threat of use, of force would make to the course of events.

There is a sense in which all levels of conflict have strategic features, as Edward Luttwak states persuasively.[9] But the Clausewitzian approach is preferable. To avoid pedantry, the terms naval strategy, airpower strategy, space strategy, and even nuclear strategy may be tolerated, but only with particular and consistent meaning. For example, naval strategy refers to the use of naval engagements for the object of war at sea; that object has to be the right to use the sea at will, or the ability to deny its use to an enemy. Maritime strategy, by contrast, refers to the use of prowess at sea for the course of events in a conflict as a whole.[10]

Provided that the means-ends reasoning which is the core of the meaning of strategy is not forgotten, common sense and a little care preclude the need for undue precision of usage. Scholars are good at making distinctions. Indeed distinctions are crucial in generating theory that should help explain, even understand, events. But drawing distinctions must be complemented by the recognition of important connections.

A Holistic Approach

Strategic theory, reasoning, or planning connects activities which otherwise are liable to be treated as autonomous realms.[11] Lacking a holistic approach to conflict assisted by the central idea of strategy, the universe of possible concern exhibits a series of often disconnected loose ends. In the absence of a strategic framework of instrumental thinking and planning, how should defense be governed? People fight on land, at sea, and in the air; they wage low-intensity, mid-intensity, and even high-intensity conflict; and, in geopolitical terms, they deter or fight in places such as Korea, Vietnam, the Falklands, the Persian Gulf, et al. Of these classifications, the first (the dimension) is inadequately exclusive, the second (the intensity of the conflict) is unhelpfully vague, and the third (the regional context) is perilously specific for planning purposes.

A strategic mindset accommodates hypothetical action or threat of action in all geographical environments, at all levels of intensity, and against all foes for all political purposes. As a practical matter, a defining aspect of strategy,[12] the strategist is anything but indifferent to the character and content of the policy in question. To harken back to Clausewitz yet again, if *the object of the war* is truly heroic politically, while friendly forces are able to perform only modestly in *engagements* that the strategist must *use*, then strategic failure is all but certain.[13]

Clausewitz exaggerates slightly, but only slightly, in observing, "The conduct of war, in its great outlines, is therefore policy itself, which takes up the sword in place of the pen, but does not on that account cease to think according to its own laws."[14] Also he expresses the unexceptionable opinion that "a certain grasp of military affairs is vital for those in charge of general policy."[15] Given his continentalist Prussian strategic culture, it is not surprising that Clausewitz might err on the side of assuming a unity of purpose between policy and strategy. It might be more accurate to state that he elected not to dwell on the divergent paths that policy and strategy could pursue. As an interpreter of Napoleonic warfare and staff officer trained to revere Frederick the Great,[16] it was unlikely Clausewitz would be drawn to any friction that could imperil the subordinate relationship of strategy to high policy that was theoretically necessary. When the duties of head of state, head of government, and principal field commander all devolve on one person, prospects for harmony between policy and military action are maximized. Had Clausewitz been geostrategically broader in his education, he might have learnt from the British experience how a maritime polity can have difficulty coordinating political, economic, and military interests.[17]

A holistic approach does not require foolishly embracing a strictly nominal coordination of political intent and military action. It recognizes that political goals and military capabilities may be poorly matched. Clausewitz was constrained by prescribing what ought to be. A holistic approach is correct. A vision of a politically desirable condition should inspire policy choices supported by a strategy that makes good use of operational competence founded on tactical excellence. In practice, tactical performance will be less than excellent, operational skills may be slim, and strategic plans may lack political guidance worthy of the name.[18] As for the political vision that should propel the entire process, it may lack practical connection to behavior in the field (for example, in the case of a united Ireland for the Irish Republican Army). Holism captures the whole, but it does not assume a perfect coordination of the whole. Clausewitz's advice on the relation between political ends and military means was not invalidated by the events of 1914–18 which, to the contrary, demonstrated just how important it is for high policy and its military instrument to be mutually empathetic.

A holistic approach operates vertically and horizontally. Seen vertically, strategy includes all aspects of peace and security from political vision to tactical military performance. Horizontally considered, it includes the application of power on land, at sea, in the air, and in space, together with *strategic* nuclear and special operations forces. It is important that this dual-axis appreciation should be accepted before challenges in detail are offered.

U.S. Army

Americans and Russians on the Elbe, April 1945.

Those who seek simple solutions to complex problems are pejoratively called reductionists. The advocates of various types of military power will argue that landpower, seapower, airpower, (would-be) nuclear deterrence, or special operations forces "can do it." They reduce the strategic problem at hand to a task that their favored capability can purportedly fulfill. It is not necessarily reductionist in a pejorative sense to recognize that there are conflicts in which a geographically or functionally specific *key force* is strategically most appropriate. For example, Northern Ireland is as obviously a special ops, low-intensity conflict case as the Falklands was a maritime problem.[19]

one should not fear to assert the identity and strategic relevance of a key force

Northern Ireland is *reduced* to a complex political problem as well as an irregular form of warfare, but it can be difficult to delineate between an analysis that penetrates to the heart of the problem (that is, the key elements) and one that reduces a complicated reality to an oversimplified, more manageable reality-as-task. One should not fear to assert the identity and strategic relevance of a key force. Notwithstanding the complexity of an issue, there is likely to be a particular kind of power, probably military, most appropriate to a specific context.[20]

It is well to be suspicious of reductionism or essentialism.[21] Also it is well to be open to the suggestion that one or another kind of power should attempt to function as the cutting edge of policy. To say that airpower was the key force in the Gulf War of 1991 is not to be reductionist, it is to be sensible. Similarly, to claim that the threats implicit in U.S. nuclear forces were key to the frustration of Soviet policy over Germany in 1948–49 and 1958–61 again is not to be reductionist, but rather to be realistic. To recognize geographical and functional variety in strategic matters is (*ipso facto*) to recognize the possible variety of key elements.

Why Strategy Is Difficult

As the great man wrote, "Everything in strategy is very simple, but that does not mean that everything is very easy."[22] Though it should be useful to recognize why strategy is difficult, it is

scarcely less useful to recognize why the explanation need not contribute to the practical solution. By analogy, the more mechanistic aspects of strategy, like art, can be taught, but people cannot be taught reliably how to be great strategists any more than great artists. There is latitude, indeed a need, for creativity in both professions that defies pedagogical programming. Intellectual mastery of purportedly permanent *principles of strategy* is probably helpful but no guarantee of success.[23]

Why is strategy difficult to achieve, let alone sustain? With some grateful borrowing and adaptation from Clausewitz, I find six connected reasons.

First, competence in strategy requires mastery of a challenging complexity. Strategy, after all, is the bridge connecting the threat and use of force with policy or politics. The strategist needs to understand what is tactically and operationally possible in all geographical environments, what success or failure in each environment (or functional dimension) contributes to performance in the other environments, what that means for military performance writ large, and what general military performance means for policy (and vice versa). Moreover, whereas strategists had only to master the combined meaning of surface forces on land and sea in 1900, their counterparts must master the synergistic meaning of land, sea, air, and space (and nuclear) forces today.

Although more complex than before, strategy has not altered at its core. It is still about "the uses of engagements for the object of the war," or—if you prefer, for a modern translation—about the threat and use of force for political reasons. As the character of the possible uses of forces has diversified, so the task of the strategist has grown ever more difficult in practice.

Second, by its nature strategy is more demanding of the intellect and perhaps imagination than any structurally more simple activity—policy, operations, tactics, or logistics for prominent examples. Excellence in strategy requires the strategist to transcend simple categories of thought. The task is not to create wise policy or successful schemes of military action, but rather to build and repair the bridge connecting the two. On the one hand, policy will be wise only if it proves feasible (in this case, militarily). On the other, brilliant military schemes can be irrelevant or worse if they promise to achieve politically inappropriate objectives.

Third, it is extraordinarily difficult to train competent strategists, let alone outstanding ones. It is very well for Clausewitz to claim glibly and misleadingly that "war is simply a continuation of political intercourse, with the addition of other means,"[24] or to argue that "in the highest realm of strategy . . . there is little or no difference between strategy, policy, and statesmanship."[25] Now, however, military and political careers tend to be very distinctive, even exclusive in many cultures. There is little in the training of soldiers or politicians to equip them for strategic responsibilities. Military professionals tend to learn how to fight and then, as they are promoted, how to organize others to fight in ever larger, militarily more inclusive formations. The soldier is not taught how engagements should be used "for the object of the war." Similarly, rising politicians are promoted based on seniority and maturing political skills. At no point in an outstanding career is there likely to be anything resembling explicit training in strategy for the politician.

Fourth, strategy is extraordinarily difficult to conduct with consistent excellence because of the unique physical and moral burdens it puts on would-be strategists. The demands of command in crisis and war can age a person as surely as a disease. Comparing film footage of Adolf Hitler in 1939 with 1944 or of Jimmy Carter in 1976 with January 1981 illustrates this point. It was with good reason that Clausewitz emphasized impediments to strategic performance imposed by danger, fatigue, and anxiety born of uncertainty. The burden of command increases with the growing level of responsibility. As people are promoted from tactical, through operational, to strategic realms of responsibility, the potential physical and moral hindrances to sound performance increase as well.

Fifth, it is worth citing what Clausewitz termed *friction*, although the previous point can be seen as encompassing aspects of this phenomenon. He advised that "friction, as we choose to call it, is the force that makes the apparently easy so difficult"[26] and observes that "friction is the only concept that more or less corresponds to the factors that distinguish real war from war on paper."[27] Friction is not unique to the strategic realm, but it is likely to be uniquely pervasive and debilitating in its cumulative effect in that realm. As modern chaos theory suggests, initially small, unpredicted, and unwanted changes of state can have massive, non-linear consequences later.[28]

Clausewitz argues that "everything in war is very simple, but the simplest thing is difficult. The difficulties accumulate and end by producing a kind of friction that is inconceivable unless one has experienced war."[29] So many and potentially synergistic are the sources of friction in war and preparation for war, that it is little short of amazing that great military enterprises can be organized and carried out at all.[30] One has to remember that friction impedes all parties in war.

The fundamental reason why friction can be so damaging at the strategic level is because, by definition, that level must accommodate, integrate, and direct all the activities that comprise war. The strategist will encounter the effects of friction from the world of policy and the geographically and functionally specialized forces which perform tactically, logistically, and operationally. Stated bluntly, at the strategic level of performance there is more that can go wrong.

success in strategy calls for a quality of judgment that cannot be taught

Finally, success in strategy calls for a quality of judgment that cannot be taught. Although there is certainly scope for individual *genius* at the tactical and operational levels of war, sound training for consistently superior military performance at those levels—friction permitting—can be provided. Strategic excellence cannot be taught the same way or to anything like the same degree. Strategy inherently requires understanding of the terms of the relationship between military power (perhaps *engagements*, after Clausewitz, or more loosely the use and threat of force) and political purpose (*the object of the war* or policy). In addition, strategy requires understanding of how very different kinds of force can generate the effectiveness to yield politically useful consequences. While these necessary truths about strategy are almost too easy to state, they can be abominably difficult to put into consistently successful practice.

Many apparently well educated officers have lacked the qualities needed for success in high command. There was General George McLellan in the Civil War and, in the British army, Field Marshal Ian Hamilton at Gallipoli in 1915 and General Archibald Wavell in the Western Desert in 1941.[31] As well as luck and bigger battalions, success in strategy typically requires, among other things, constitutional fortitude (physical and mental),[32] a sophisticated grasp of political essentials, and an ability to make and stick to judgments in the face of gross uncertainty. Education should help, but there is truth in the claim that strategists are born rather than made. Westmoreland could be trained to direct troops efficiently in the field but not to perform with strategic excellence in the wise conduct of an unusually difficult war.

Tank maneuvers in France, 1918.

U.S. Army Military History Institute

Strategic performance is inescapable. The quip that "you may not be interested in strategy, but strategy is interested in you," refers to an enduring truth. The only alternative to good strategic performance is fair or poor strategic performance, not no strategic performance. Engagements of all kinds, conducted by various types of forces, impact on the conduct and outcome of a conflict; that is, they have a strategic effect or generate some quantity of strategic effectiveness. That is how strategy works. Because some polities at certain times behave as if strategy and strategists were an option in fighting, and since strategy from its origins (the art of the general) implies purposeful and skillful direction, the true ubiquity of the phenomenon of strategic effect can evade notice.

Unplanned or ill-conducted engagements must have some influence on a general progress, or lack of progress, registered on behalf of the object of the war. Not only do the tactical and the operational levels of war implement strategy, but even when there is no strategic direction worthy of the name, tactical and operational behavior has strategic effect, albeit undirected centrally. This is not to downplay the significance of strategy, but to claim that strategic performance can only rest on tactical performance. One need not, indeed should not, endorse all of Clausewitz's argument to accept the strength of his claim "that only great tactical successes can lead to great strategic ones," or that "tactical successes are of paramount importance in war."[33] Whether or not the enemy is actually destroyed or comprehensively defeated, indeed whether or not success attends our forces, tactical activity must have strategic effect. **JFQ**

NOTES

[1] For example, H.P. Willmott, *The Great Crusade: A New Complete History of the Second World War* (New York: The Free Press, 1989), p. xi.

[2] Ronald D. Spector, *After Tet: The Bloodiest Year in Vietnam* (New York: The Free Press, 1993), p. 314.

[3] Carl von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976; first published 1832), pp. 88–89.

[4] Ibid., p. 579.

[5] See Colin S. Gray, "New Directions for Strategic Studies? How Can Theory Help Practice?" *Security Studies*, vol. 1, no. 4 (Summer 1992), pp. 610–35.

[6] Clausewitz, *On War*, p. 128.

[7] John I. Alger, *Definitions and Doctrine of the Military Art Past and Present* (Wayne, N.J.: Avery Publishing, 1985), p. 5.

[8] Martin van Creveld, *Nuclear Proliferation and the Future of Conflict* (New York: The Free Press, 1993), p. 1.

[9] Edward N. Luttwak, *Strategy: The Logic of War and Peace* (Cambridge: Harvard University Press, 1987), p. 69.

[10] See Julian S. Corbett, *Some Principles of Maritime Strategy* (Annapolis: Naval Institute Press, 1988; first published 1911), pp. 10–11. Distinctions between naval and maritime strategy are exerted, developed, and exploited admirably in Jan S. Breemer, "Naval Strategy Is Dead," *U.S. Naval Institute Proceedings*, vol. 120, no. 2 (February 1994), pp. 49–53. Breemer argues that naval strategy is dead for the United States because for the next few years, at least, there is no other navy in the world capable of menacing American sea control.

[11] For an earlier raid on this topic, see Colin S. Gray, *War, Peace, and Victory: Strategy and Statecraft for the Next Century* (New York: Simon and Schuster, 1990), chapter 10, "Seeing the Problem Whole."

[12] "Strategic thinking, or 'they' if one prefers, is nothing if not pragmatic. Strategy is a 'how to do it' study, a guide to accomplishing something and doing it efficiently. As in many other branches of politics, the question that matters in strategy is: Will the idea work? More important, will it be likely to work under the special circumstances under which it will next be tested?" Bernard Brodie, *War and Politics* (New York: Macmillan, 1973), p. 452.

[13] Consider France's political goals in Indochina in relation to its political-military assets. The grim story may be approached most usefully via Bernard Fall: *Street Without Joy* (New York: Schocken Books, 1964); and *Hell in a Very Small Place: The Siege of Dien Bien Phu* (Philadelphia: J.B. Lippincott, 1967).

[14] Clausewitz, *On War*, p. 610.

[15] Ibid., p. 608.

[16] See Peter Paret, *Clausewitz and the State* (New York: Oxford University Press, 1976).

[17] Like modern Israel, Prussia was awkwardly shaped and lacked robust natural frontiers. The influence of Prussia's distinctly continentalist geostrategic situation on Clausewitz has yet to receive adequate recognition. For example, Christopher Bassford, *Clausewitz in English: The Reception of Clausewitz in Britain and America, 1815–1945* (New York: Oxford University Press, 1994), is generally excellent but fails to consider the lack of a maritime dimension to his theorizing.

[18] Colin S. Gray, *Weapons Don't Make War: Policy, Strategy, and Military Technology* (Lawrence: University Press of Kansas, 1993), chapter 4.

[19] The geography of the Falklands as a theater mandated a maritime strategy, but the style of the British reconquest had the general character of "a commando operation writ large." Edward N. Luttwak, Steven L. Canby, and David L. Thomas, *A Systematic Review of "Commando" (Special) Operations, 1939–1980* (Potomac, Md.: C and L Associates, May 24, 1982), p. P–2.

[20] Acknowledging the need for jointness and capabilities in all geographical environments is not to be blind to a maritime or continental tilt in strategic culture. I developed these thoughts in *The Navy in the Post-Cold War World: The Uses and Value of Strategic Sea Power* (University Park, Pa.: Pennsylvania State University Press, 1994), chapter 4.

[21] See Gray, *War, Peace, and Victory*, pp. 323–24; and David Hackett Fischer, *Historians' Fallacies: Toward a Logic of Historical Thought* (New York: Harper and Row, 1970), pp. 172–75.

[22] Clausewitz, *On War*, p. 178.

[23] Allegedly "immutable principles of strategy" are presented in Antoine Henri de Jomini, *The Art of War* (London: Greenhill Books, 1992, reprint of 1862 edition), pp. 327–35.

[24] Clausewitz, *On War*, p. 605.

[25] Ibid., p. 178.

[26] Ibid., p. 121.

[27] Ibid., p. 119.

[28] See Alan Beyechen, "Clausewitz, Nonlinearity, and the Unpredictability of War," *International Security*, vol. 17, no. 3 (Winter 1992/93), pp. 59–90; and David Nicholls and Todor D. Tagarev, "What Does Chaos Theory Mean for Warfare?" *Airpower Journal*, vol. 8, no. 3 (Fall 1994), pp. 48–57.

[29] Clausewitz, *On War*, p. 119.

[30] For a wonderful case study of friction and overcoming it, see John France, *Victory in the East: A Military History of the First Crusade* (Cambridge: Cambridge University Press, 1994), who concludes that it was the "growth of the coherence and experience of the crusader host as a whole which was the key to their military success."

[31] Unlike McClellan, who was in over his head, Hamilton and Wavell were able soldiers trapped in contexts unforgiving of error, weakness, and plain bad luck. On Hamilton, see E.K.G. Sixsmith, *British Generalship in the Twentieth Century* (London: Arms and Armour Press, 1970); and Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: The Free Press, 1990). Ian Beckett, "Wavell: Field-Marshal Earl Wavell," in *Churchill's Generals,* edited by John Keegan (New York: Grove Weidenfeld, 1991), is fair and persuasive.

[32] Clausewitz believed that the determination needed for success flows more from a strong than brilliant mind; intelligence, even knowledge, and strength of character are not synonymous.

[33] Clausewitz, *On War*, p. 228.

THE AMERICAN REVOLUTION in Military Affairs

By WILLIAM A. OWENS

We use the term *revolution in military affairs* (RMA) a lot today. It comes up in briefings at the Pentagon. Journalists and academics write about it. We discuss it within the Armed Forces and with military leaders from other nations. That is as it should be, for RMAs can be disturbing. They demand considerable debate and dialogue if we are to master them. So what is the current RMA? Where does it stand today? And where will it go?

As the essays in this issue of *JFQ* suggest, the revolution is alive, healthy, growing, and stirring the debates, insights, and passions which accompany rapid and significant innovation, especially in the United States. Indeed, the world will increasingly refer to the "American" RMA, for while military thought outside this country reflects some aspects of what is underway, it is here that the discussion is deepest and the technologies that drive the revolution are most robust. And it is here that the integration of those technologies with each other and with military organization and doctrine has already begun.

RMA involves changes across institutions, doctrine, and the use of force

Like every other revolution, the American RMA involves big changes—changes that occur or can be recognized suddenly and that spread across institutions, doctrine, and the way we think about the use of force. What makes revolutions disturbing, of course, is not the scope, speed, and extent of innovation as much as what must be given up to consummate them. The problem with deep, fast, and rampant innovation is not getting people to accept the new but to surrender the old. Most will flirt with the future, but few want to embrace it at the expense of a comfortable present.

In some respects, this is an apt commentary on the state of the current revolution. We now have a pretty good idea that the American RMA stems from the way several particular technologies will interact. Most senior military and civilian leaders agree that the specific technologies are those that allow us to gather, process, and fuse information on a large geographical area in real time, all the time; that allow us to transfer that information—call it knowledge—to our forces with accuracy and speed; and that provide us the capacity to use force with speed, accuracy, precision, and great effect over long distances. Moreover, there is agreement on their interaction. We have decided to build what some of us call the *system of systems*; namely, interactions that will give us dominant battlespace knowledge and the ability to take full military advantage of it.

The evidence of this collective agreement is in the defense budget, the recommendations of the Chairman's Program Assessment, and in what the services state in white papers, staff studies, and battle laboratories. Funds allocated for the programs that will give us the system of systems are growing at rates considerably higher than the overall DOD budget. The Chairman's Program Assessment recommended this, an idea generated largely by intense, in-depth discussion among senior military leaders and work in the last two years of the Joint Requirements Oversight Council (JROC). And whether it is found in *Army XXI*, *Forward . . . From the Sea*, the Sea Dragon initiative, or *Global Presence*, the basic argument is similar, reflecting the commitment to radically improved situational awareness, agile communications, and precision weaponry.

So the decisionmakers inside the Pentagon agree on the path of the future. Deciding to take this revolutionary course was not easy, for in a period

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when our budget will not rise appreciably, reallocating resources in favor of the system of systems means starving programmatic pets in order to nourish the new arrivals. Yet that is our decision.

There is less agreement on how fast to go down this path—on how much to accelerate the system of systems—and what should be given up in the process. But the commitment on direction is clear and, I believe, irrevocable. As a result, the United States will be the first nation to emerge in the post-revolutionary era equipped with proficiencies that will perhaps change the character of warfare as it has been known for centuries.

RMA suggests a range of force structure issues that have yet to be resolved

While we are now moving down the revolutionary path and have accepted the prospect of large scale innovation—which occurs relatively quickly and spreads across institutions, doctrine, and thought—not everything is settled. We currently lack a firm consensus on two dimensions of this American revolution. The first is what it means, more specifically, for military organization and doctrine. The second is what it means for U.S. foreign policy and our role in the world.

Most of us inside the Pentagon believe our institutions will change, perhaps dramatically. But we have come to this deductively, not from empirical, detailed assessments and experiments that must be done. Still, the kind of information-empowered, dominantly knowledgeable forces in our common vision call for flattened, less hierarchical organizations. The concept of being able to *see* a large battlefield with great fidelity raises intriguing possibilities. For instance, if we know where enemy forces are and what they are doing—in detail as well as real time—and engage them with highly accurate, reliable, and effective longer range weapons, why would we require the kind and size of close air support forces that exist today? Indeed, does not that capability suggest that the need to build units in reserve on the tactical and operational levels will become an anachronism? And surely there is a subtle relationship between the kind and the size of logistics structures needed and the precise, real time logistics data we will have on tactical requirements and material flows. In short, the American RMA suggests a range of force structure issues that have yet to be resolved. We sense collectively that they loom just over the horizon. But the status of this dimension of the revolution remains unclear, with little firm agreement as to what is to be done.

Part of this ambiguity reflects the profound challenge which the American RMA posits to the Clausewitzian idea of war, the notion of the "fog and friction" of conflict. Clausewitz probably articulated as well as any other theorist what experienced warriors sense to be true—that the clash of military forces is so complicated as to seem chaotic, so ambiguous that even the simplest plans and actions are difficult, so uncertain as to form an impenetrable fog that obscures predictability. First stated at the outset of the 19th century, these ideas have underpinned military thinking in the United States and elsewhere throughout this century. Today we find them in doctrine ("fog and friction" as inherent to operations), structure (units in reserve as a hedge against the "inevitable" fog and friction of war), and the design of command and control systems (redundancy assuring the transmission of information in the face of unexpected delays).

In fairness, the architects of the American RMA have never claimed to be able to completely dissipate the fog of war nor fully eliminate the friction of conflict. However they have argued that the revolution can introduce such a disparity in the extent to which fog and friction apply to each side in war as to give one unprecedented dominance. Notwithstanding that important nuance, this revolution challenges a vital assumption about our thinking on the use of force—and the attitudes and institutions resting on that assumption. This is ultimately what makes it a true revolution.

It is no wonder, then, that we have not reached a consensus on the doctrinal and structural implications of the revolution. Yet, as in deciding to embark on the revolution, we have committed ourselves to working them out. This effort, too, is probably irrevocable, and our willingness to think seriously about such things will increase our revolutionary lead.

In dealing with these questions, we must also address the equally compelling issue of what this RMA means in terms of foreign policy. Even if it lives up to its military promise of unequaled potency, that will not necessarily make achieving our goals easier, particularly in building a stable, just, and free world. The disparity in military power which RMA offers the United States presents a dilemma: how can we use this power to deter and compel—that is, to convince other nations that they cannot prevail against us—without frightening them into attempting to counter our power? We have not agreed on an answer. We have hardly examined the question.

Where does this American RMA stand as we near the next millennium? It is in full swing. We are embarked on a revolutionary path, the system of systems is emerging, and importantly we have accepted the promise and the risk of innovation. We have not, however, reached agreement on how fast to traverse this course nor exactly what the journey will entail. While underway, the revolution is not yet consummated. It is time for discussion, debate, and insights—appropriate for the contributions in this JFQ Forum. JFQ


NORAD/SPACECOM Command Center, Cheyenne Mountain.

U.S. Air Force (Carol Floyd)

The strategic force commander sat in a dimly-lit subterranean command center, waiting for the battle to start. Each of his component commanders was settled in front of a luminescent screen which displayed aspects of an ongoing situation half a world away. Green icons marked positions of enemy command and control nodes as electronic lightning flickered across the displays revealing traffic over networks.

The war had begun three weeks ago when the President approved the infiltration of enemy information networks. Since then information warfare teams had worked hard to compromise enemy command and control systems. They saw themselves as commandos of the information age who moved unnoticed through information networks, searching out and mapping the sinews that bound the enemy together. Some they would destroy; others they would leave alone.

Thousands of miles away, the first strike began exactly at midnight. Fingers of light arced into the dark sky off the enemy coast as semi-submersible arsenal ships launched wave after wave of ballistic missiles. High overhead stealthy aircraft released their deadly payloads, cruise missiles armed with electromagnetic-pulse warheads designed to short-circuit electronic systems. Nearby, a wing of penetrating aircraft carrying precision-guided munitions peeled away and began bombing runs. In space above them, a constellation of small satellites began to de-orbit payloads of heavy-metal rods capable of destroying the hardest targets known to man.

The commander watched the attack take shape from his underground sanctuary. A network of satellites and unmanned air vehicles began to provide the command center with battle damage assessment data as the attack was still underway. The objective of the strike had been to blind the enemy by dismembering his command and control system, and initial reports showed that it had been largely successful. A red stain spread across the situational displays indicating that the initial waves of ordnance had ripped holes in enemy command and control networks. But other nodes remained functional. Here and there other green lights started to flicker, indicating the presence of previously unknown nodes only now coming to life in the wake of the first attack.

The automated battle manager had already evaluated the initial results of the attack and was formulating the next strike. A list of weapon-target pairings appeared on a screen in front of the commander. He deleted several targets, withholding them for later, then sent the list forward to his component commanders for execution. He looked over at his theater force commander, seated at another screen across the room. Only time would tell whether his men would be needed to bring this conflict to a close.

FIRST PRIZE 95 REVOLUTION IN MILITARY AFFAIRS

War in the Information Age

By THOMAS G. MAHNKEN

Over the next few decades, the growth of microprocessing and information technology will create a revolution in military affairs (RMA) that transforms the tools, conduct, and eventually the nature of war.[1] The emergence of long-range precision strike and information warfare may usher in an era of conflict based on paralysis and shock rather than attrition. While no panacea, concepts and organizations for waging war in the information age may offer us decisive advantages over a range of regional enemies as well as leverage against a peer competitor, should one emerge.

The development of systems which collect, process, evaluate, and distribute information is already changing the way we plan and conduct military operations. Advances in sensor technology and data processing will allow us to gather and interpret an extraordinary amount of information about our forces, those of prospective enemies, and the battlefield itself. Sensors operating across the electromagnetic spectrum will locate targets as information processors fuse data from disparate sensors into a single coherent picture. They will enable us to understand where force can be decisive as well as offer greater control over its use. Robust command, control, and communications (C^3) systems will help disseminate the resulting information in seconds, while stealthy precision strike systems will attack an enemy discriminately at long range. Advanced guidance technology, including data from global positioning system (GPS) navigation satellites, will let us strike targets with an accuracy of feet from standoff distances. As a result, we may be able to destroy virtually any enemy target that can be identified.

the most far-reaching effect is the ability to integrate a myriad of systems

The most far-reaching effect of the information revolution is the ability to integrate a myriad of systems into what the Vice Chairman, Admiral William Owens, calls a "system of systems."[2] The network's sensors could sweep the battlefield in search of an enemy, with data processing systems fusing sensor inputs into a single coherent picture and disseminating it to units worldwide. Individual weapon systems could use this information to "bid" on targets, much as traders bid on stocks, with an automated battle manager determining optimum weapon-target combinations. Data from space-based sensors might, for example, be used to target aircraft dropping precision-guided munitions, while special operations forces deep behind enemy lines might be called on to identify targets for long-range ballistic or cruise missile strikes. During and after strikes networked sensors would gather, evaluate, and disseminate battle damage assessment (BDA) much more rapidly than has heretofore been possible.[3]

The effectiveness of long-range precision strike systems will be decided by a game of hide-and-seek played by our sensors and enemy targets. If advances in stealth, deception, and mobility outpace the ability of sensors to acquire targets, then long-range precision strike systems will be ineffective. If, on the other hand, information fusion renders the battlefield transparent, long-range precision strikes will be lethal. Where we end up on this continuum will shape the character of war in the information age.

As the ability to gather, fuse, and disseminate information becomes more central to military affairs, information networks may themselves become critical targets. Thus information warfare, by which a state denies or manipulates the intelligence available to an enemy, may permeate all levels of conflict, from sophisticated tactical electronic warfare to strategic attacks against civil and military information infrastructure. Some see the information revolution as the dawning of a new, bloodless age of conflict dominated by "netwar" and nonlethal technologies.[4] More modestly, it is likely to expand the options available to decisionmakers for waging lethal war.

The Dawn of Shock Warfare

The increasing range and accuracy of weapons will enable us to mass extremely lethal fires at will. Rather than closing on an enemy, we may be able to engage and destroy it at long range. Moreover, the advent of information warfare may allow us to disrupt those networks that allow an enemy to act in a coordinated manner. In combination, long-range precision strike and information warfare capabilities may provide the means to focus our strengths against enemy weaknesses and thus crush its will to resist. The result is likely to be a new paradigm of warfare, based not on attrition but on the ability to paralyze and shock. A fundamental tenet of attrition warfare is that victory can be achieved through the progressive destruction of an enemy. In the end, it is the threat of further punishment that causes surrender. Shock warfare, by contrast, compels an enemy to follow the course that we desire by foreclosing options which we deem undesirable.

A campaign combining strategic information attack and long-range precision strike could afford us substantial leverage against a future enemy. The initial phase would seek to disorient or paralyze an enemy by disrupting its decision cycle. This may, in turn, undermine its confidence by creating uncertainty about controlling the course and outcome of a conflict. It may also increase our capacity to surprise an enemy. Strikes on hostile command and control systems, for example, could hamper enemy ability to employ forces effectively by interfering with the leadership's ability to collect, process, and disseminate information.[5]

Should the initial operation prove insufficient to break enemy will, we might destroy its capability to resist by massive, coordinated strikes on a range of key target networks.[6] Leverage could accrue from the ability both to achieve greater battlespace awareness than an

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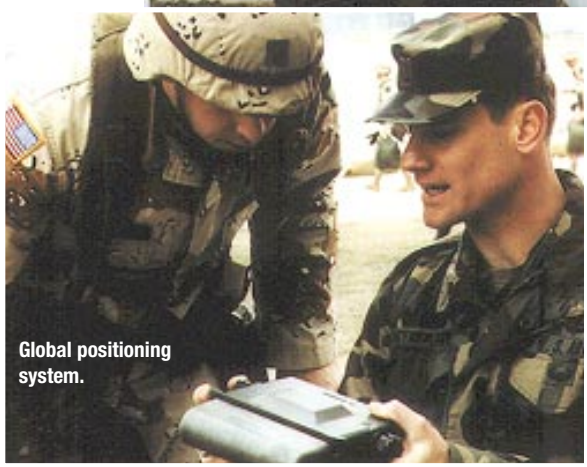
enemy and to exploit that advantage by operating faster than an enemy can react.

The effectiveness of such a strategy will depend in part on our ability to collect, assess, disseminate, and exploit information. There is, within reasonable bounds, a relationship between our level of battlespace awareness and the effectiveness of our forces. At a relatively low level of awareness, for example, we may be able to identify discrete targets but unable to understand their relationship. As awareness increases, we may understand how targets form systems and identify key nodes within each system. That may allow us to employ our forces more efficiently.[7]

Mobile communications terminal.

U.S. Army



Global positioning system.

U.S. Army

One way to increase the effectiveness of our forces in war will be to develop a sophisticated understanding of potential enemies in peace. Intelligence to support information warfare and long-range precision strike will, however, be a major challenge.[8] We will need not only to identify individual targets with precision but to understand how they fit into networks. In addition, we must understand which nodes and networks are vulnerabilities.[9] Highly centralized target systems such as national leadership may be vulnerable to a relatively small number of well-placed strikes. By contrast, highly distributed systems such as cellular communication networks might be much more resistant to disruption. Furthermore, we must understand the effect of our strikes upon an enemy's capacity and will to wage war. This will require not only the ability to view an enemy as a coherent system, but insight into its values and strategic culture. One way to improve our understanding of potential enemies might be to constitute multidisciplinary teams of analysts with expertise in intelligence, information systems, targeting, and weapons effects. Such teams could conduct both studies of an enemy's society and culture to determine the most effective ways to shatter its will and in-depth analyses of its target networks to identify vulnerabilities.

decisive outcomes are likely where one side has a marked information advantage

The shape of future warfare will largely depend on achieving an information advantage. One can imagine a situation in which neither side possesses a high battlespace awareness. In such circumstances, neither would be able to conduct decisive operations. Such a battle might resemble a duel between blind swordsmen. A conflict in which both sides enjoy a high level of battlespace awareness might look more like a chess match between grand masters, each maneuvering while waiting for the other to make a mistake. By contrast, decisive outcomes are likely to result from situations where one side enjoys a marked information advantage, as the United States did during the Battle of Midway and the Gulf War.

A future war may thus begin with an information suppression operation aimed at reducing our enemy's battlefield awareness while we protect our own. Achieving information dominance against a peer competitor with distributed and redundant sensor and communication networks is likely to be difficult. Gaining an information advantage will depend on how well we can identify and destroy the key nodes of an enemy's information infrastructure. The level of success required of such an operation will, however, depend on our overall objectives. It may be unnecessary, for example, to sever all links from enemy leadership to its forces. It may be sufficient to disrupt the timing and coherence of its military operations for a period.

The information suppression operation could include attacks on command and control networks, civil telecommunications, and even military and civilian leaders. Long-range ballistic missiles with high-explosive and earth-penetrating warheads, for example, could be used against leadership targets, including hardened facilities, while cruise missiles armed with electromagnetic-pulse warheads disrupted information networks. Some targets may be fixed and others mobile. Coordinating such an operation would include deciding which networks should be infiltrated and exploited and which ones destroyed.

However extensive prewar preparations, we are unlikely to ever enjoy perfect information about an enemy.[10] In the words of Jomini:

> [While it] *is unquestionably of the highest importance to gain [perfect] information, so it is a thing of the utmost difficulty, not to say impossibility; and this is one of the chief causes of the great difference between the theory and the practice of war.*[11]

We may fail to identify key nodes in an enemy's infrastructure or be unable to destroy those we attack. Nor will an enemy stand by passively as it is pummeled. Rather, it will attempt to repair individual targets, reestablish old networks, and build entirely new ones. Success will ultimately depend on destroying enemy information networks faster than they are rebuilt. Conducting rapid battle damage assessment and formulating and launching follow-on strikes before an enemy reacts may therefore be a key source of leverage.

An information suppression operation could shatter an enemy's will to fight and force it to sue for peace. If so, we may achieve Sun Tzu's ideal of victory without combat. Even should an information suppression operation fail to bring victory, we may hamper an enemy's capability to anticipate and react to our actions by disrupting its means of collecting and processing information. Moreover, we may reduce its capacity to transmit timely and coherent orders, thereby limiting its ability to coordinate its forces.

Having suppressed enemy information-gathering, we could attack capabilities that are vital to military operations. The selection of target systems will depend on the character of an enemy and our overall objectives. The scope and duration of the operation will depend on an enemy's sophistication and retaliatory capability as well as our ability to identify and swiftly strike its target systems. Against a relatively unsophisticated enemy with a limited infrastructure such an operation may be relatively straightforward; against a peer competitor it could involve the integrated use of tens of thousands of precision-guided munitions over hours or days. In any event, our capacity to inflict shock will depend on an ability to strike vital target systems in parallel over a short period.[12] In essence this was the approach of air planners prior to the Gulf War: rather than rolling back Iraqi air defenses before attacking strategic target systems, networks were bombed from the outset of the war.[13]

the ability to disrupt enemy information networks may deter aggression

Strategic air and missile defenses are a prerequisite to strikes against vital assets. Without them, an enemy could credibly threaten retaliation against U.S. forces and allies for strikes upon its homeland. Defenses could protect friendly forces and reduce an enemy's confidence in achieving its objectives by long-range strikes. Moreover, the combination of long-range precision strike and strategic defense may convince an enemy that continuing to employ offensive systems is futile. An enemy may instead decide to retain its forces for postwar bargaining.

A strategic campaign of the sort outlined above could prove insufficient to force an enemy to capitulate in and of itself. In such a case, we may need to deploy ground forces to defeat an enemy in the field. Long-range precision strikes may acquire a role as a precursor to theater power projection operations, just as naval gunfire has preceded amphibious landings. Such an operation could dismember an enemy's ability to command and control its forces, allowing our theater forces to defeat any remaining pockets of resistance in detail. At a minimum, it might disorient an enemy, reducing its ability to oppose the insertion of theater forces.

The combination of weapons of mass destruction and long-range precision weapons will make the future battlefield extremely lethal. To credibly project power abroad, we must develop organizations that fight effectively in such an environment. This may include the means to insert and extract forces rapidly. Once inserted in a theater, ground forces may have to disperse, reduce their signature, and move rapidly.[14] They may, in fact, come to resemble the Pentomic division, designed to operate on the nuclear battlefield.[15]

From Theory to Practice

No single concept of warfare can address the entire spectrum of conflicts we may face. The type of campaign described above, for example, will have limited utility at the low end of the warfare spectrum, though intelligence, surveillance, and reconnaissance capabilities may be useful in such contingencies. The combination of long-range precision strike and information warfare may instead provide our decisionmakers with expanded options to deter and wage war against regional powers or a peer competitor. The demonstrated ability to disrupt enemy information networks, for example, may deter aggression. Threats against command and control systems could render an enemy unable to direct its forces should war occur, while destruction of the civil telecommunications system could disrupt its economy. Moreover, in authoritarian states which rely upon repression for political control, such strikes could lead to civil unrest. The acquisition of long-range precision strike and information warfare may also provide options for non-nuclear extended deterrence of aggression against our friends and allies. While the emerging RMA is unlikely to provide a risk-free option for waging strategic warfare against a nuclear-armed enemy, at least without robust

strategic air and missile defenses, long-range precision strike and information warfare could accomplish some of those missions heretofore reserved for nuclear weapons.

We cannot, however, expect potential enemies to sit idly by as we amass the means to dismember them. They may take any number of steps to reduce our ability to bring long-range precision strike and information warfare assets to bear upon them. Perhaps the best way to deter us from employing shock warfare would be to acquire nuclear weapons. An enemy may also use camouflage, concealment, and deception to reduce our ability to identify and target key nodes in its infrastructure. Or it could move them underground. Over time, an enemy might even attempt to eliminate all key nodes. Centralized switched telephone networks could be replaced by distributed cellular networks, and national power distribution could be replaced by local networks. An enemy could also use information warfare techniques to disrupt our command and control networks.

Nor may we be free to conduct long-range precision strikes and information warfare based on military effectiveness criteria alone. In the future as today, the use of force will be limited by political considerations. We may, for example, be constrained from striking an enemy homeland, especially if it possesses the means to threaten us with weapons of mass destruction. Future wars could come to resemble not the Gulf War, where our Armed Forces were free to strike virtually any military target they wanted, but the Korean War, where concern over potential Chinese and Soviet responses restricted our actions and created a sanctuary from which enemy forces operated with impunity. Or our dependence on space systems for navigation, communication, and intelligence collection may translate into a reluctance to launch attacks against an enemy's space systems for fear of retaliation. The use of information warfare may likewise be restricted, especially during peacetime. The President might, for example, preclude the Armed Forces from infiltrating an enemy's networks for fear that discovery of such activities could provoke a conflict. Or it might preclude information warfare attacks on networks carrying both civilian and military data for fear of collateral damage.

The emerging military revolution will not eliminate Clauzewitzian friction. Nor will it usher in a new age of bloodless conflict. It may, however, offer us leverage against a range of enemies in peace, crisis, and war. Long range precision strike and information warfare capabilities may deter a potential enemy and offer coercive leverage to resolve crises and conflicts in our favor. Should we fail to exploit the emerging RMA, however, we may well find ourselves at the mercy of another power who has mastered it. **JFQ**

NOTES

[1] See, for example, A.J. Bacevich, "Preserving the Well-Bred Horse," *The National Interest,* no. 37 (Fall 1994), pp. 43–49; Mary C. FitzGerald, "The Russian Image of Future War," *Comparative Strategy*, vol. 13, no. 2 (April–June 1994), pp. 167–80; James R. FitzSimonds and Jan M. van Tol, "Revolutions in Military Affairs," *Joint Force Quarterly*, no. 4 (Spring 1994), pp. 24–31; Andrew F. Krepinevich, Jr., "Keeping Pace with the Military-Technological Revolution," *Issues in Science and Technology*, vol. 10, no. 4 (Summer 1994), pp. 23–29; and Andrew F. Krepinevich, "Cavalry to Computer: The Patterns of Military Revolutions," *The National Interest* , no. 37 (Fall 1994), pp. 30–42.

[2] William A. Owens, "The Emerging System of Systems," *U.S. Naval Institute Proceedings*, vol. 121, no. 5 (May 1995), pp. 35–39.

[3] Implementing such a concept puts a premium on the ability to gather, correlate, interpret, and transmit information much more rapidly than previously possible. This then poses daunting challenges to data fusion, high-data-rate communications, and inexpensive precision munitions. See James R. FitzSimonds, "The Coming Military Revolution: Opportunities and Risks," *Parameters*, vol. 25, no. 2 (Summer 1995), p. 34.

[4] See John Arquilla and David Ronfeldt, "Cyberwar is Coming!" *Comparative Strategy*, vol. 12, no. 2 (April–June 1993), pp. 144–46; and Alvin and Heidi Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century* (New York: Little, Brown and Company, 1993).

[5] In some ways, the Gulf War represented the first attempt to implement such a strategy. Coalition air campaign planners hoped to strike at Iraq's central nervous system by attacking the leadership, telecommunications, and electric power systems to paralyze the regime in Baghdad. See Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey*, volume I, *Planning and Command and Control* (Washington: Government Printing Office, 1993), pp. 109–11.

[6] A similar strategy was favored by ancient Chinese generals who viewed operations as the interaction of ordinary force (*cheng*) and extraordinary or unconventional force (*ch'i*). The former fixed and made an enemy vulnerable to unconventional force, a flanking maneuver that disrupted enemy strategy and forced capitulation. See the discussion in Sun Tzu, *The Art of War*, translated by Samuel B. Griffith (London: Oxford University Press, 1963), pp. 42–43.

[7] Conversely, lacking reconnaissance, surveillance, and data processing, an enemy may be able to make up for a relatively low level of information by employing its forces *en masse*.

[8] See Edward A. Smith, Jr., "Putting It Through the Right Window," *U.S. Naval Institute Proceedings*, vol. 121, no. 6 (June 1995), pp. 38–40.

[9] See John A. Warden III, "The Enemy as a System," *Airpower Journal*, vol. 9, no. 1 (Spring 1995), pp. 40–55.

[10] Kenneth F. McKenzie, Jr., "Beyond Luddites and Magicians: Examining the MTR," *Parameters*, vol. 25, no. 2 (Summer 1995), pp. 17–19.

[11] Baron de Jomini, *The Art of War*, translated by G.H. Mendell and W.P. Craighill (Philadelphia: J.B. Lippincott & Co., 1862), p. 245.

[12] For a cogent critique, see Richard Szafranski, "Parallel War: Promise and Problems," *U.S. Naval Institute Proceedings*, vol. 121, no. 8 (August 1995), pp. 57–61.

[13] Keaney, *Gulf War Air Power Survey*, volume I, chapter 1.

[14] Gordon R. Sullivan and James M. Dubik, *Land Warfare in the 21st Century* (Carlisle Barracks, Pa.: Strategic Studies Institute, U.S. Army War College, 1993), pp. 12–25.

[15] See, for example, A.J. Bacevich, *The Pentomic Era: The U.S. Army Between Korea and Vietnam* (Washington: National Defense University Press, 1986), chapters 3 and 5.

Acoustics on the 21st Century Battlefield

By MARVIN G. METCALF

At 0248 hours, eight Apache helicopters pushed into enemy territory, flying fifty feet above the ground at 120 mph. Lieutenant Colonel Johnson, the Black Team commander, assigned the lead aircraft the primary mission of navigation. Each relied on a TADS/PNVS suite, enabling them to fly and fight at night in bad weather. For operational security, the team flew at high speed and low altitude with navigation lights blacked out and total radio silence, a dangerous combination. They were going in to strike a newly detected critical mobile target, a concentration of surface-to-surface missiles (SSMs) which had just deployed in the deep battle area.

Suddenly the sky, hills, and ground below were surreally lit by a blinding flash as the lead helicopter exploded. As night vision devices returned to normal, trailing crews detected incoming missiles. Several of the Apaches fired their 2.75 inch (70mm) Hydra rockets in the direction of the attackers. The team then went to ground, hovering low in any covered or concealed position that was available. The rearmost Apache had time to detect and hit an enemy Mi–28 Hokum helicopter with a well-placed Longbow Advanced Hellfire missile.

Attackers and defenders hovered in effective hide positions. Luckily for the Black Team, the attack seemed to be a chance engagement rather than a prepared ambush. The ensuing battle, during which both sides maneuvered for position, was like a firefight between two infantry patrols with troops dodging from rock to tree as their teammates tried to pick off any enemy soldiers who happened to expose themselves to fire.

Johnson knew that time was on the side of the enemy, whose ground forces, surface-to-air weapons, and perhaps attack helicopter reinforcements would soon arrive. Disengaging would be difficult. So he gave the order to use his unit's new weapon system: "Fire acoustic missiles!"

U.S. Army

Each helicopter fired two missiles which rose to an altitude at which discriminating sensors could quickly detect, locate, and identify enemy Hokum helicopters. The Hokums hovered out of sight behind tree stands, hills, and buildings, but to no avail. Within seconds the missiles pitched over and homed in on their targets. They fell straight down through the rotor blades destroying all six of the remaining Hokums.

Colonel Johnson played it safe. After counting the six explosions, he was fairly certain that the acoustic missiles had destroyed all or nearly all the engaging enemy helicopters. He then cautiously began to maneuver his team out of the area. Within moments, the Black Team was again en route to the target area. This mission was critical: the enemy SSMs had to be destroyed.

Are there really acoustic missiles that can detect, identify, and home in on enemy targets? Even flying targets like Hokums? This may be technology of the future, but it is just around the corner. A prototype acoustic homing sensor system is being tested as the brilliant anti-tank (BAT) submunition for the Army tactical missile system (ATACMS) or for the tri-service stand-off attack missiles (TSSAM).

To stay ahead of the power curve, commanders should anticipate high-tech weapons such as acoustic missiles. Many technologies will emerge, proffering more opportunities for high-tech battlefield applications. The operational commander of the 21st century must understand, integrate, and apply innovative capabilities to find, fix, fight, and finish enemy forces.

Targets and Sensors

Acoustics exemplify emerging technologies with great potential for the high-tech battlefield. The acoustic-based seekers are ideal as wide area target acquisition sensors. Coupled with terminal guidance sensors, they can find and kill targets. That such precision strike weaponry—acoustic or otherwise—is the wave of the future even impressed the public during the Persian Gulf War.

More accurate sensors require smaller warheads which offer economical trade-offs. These warheads reduce logistical requirements as well as inflict less collateral damage and fewer civilian casualties. Such technological advances will yield several significant gains for future warfighting. The superiority of acoustic sensors for wide area target acquisition is derived from the technology itself. Various electromagnetic (radio/radar) or electro-optic (EO) sensors in general use today are able to receive only very narrow bandwidths. For instance, EO sensors can usefully picture only small, specific areas. Though scanning techniques can be used to broaden the field, a lot of time is necessarily lost trying to find the specific bandwidths or locations of likely targets. It is somewhat like scanning a large crowd for a particular individual through a straw.

Unlike existing sensors, an acoustic sensor is wide open, searching across all frequencies and angles. Also, it is very low in background noise. Its wide-open, simultaneous acquisition of all incoming signals means it is a much more efficient sensor, especially when complemented by a "soda-straw" sensor that can be pointed at the target for added data collection or terminal guidance.

The potential of acoustic technology was recently dramatized by applying it to anti-armor munitions in the form of BAT munitions. However, this development is merely an extension of the traditional military ear for listening to sounds on and around the battlefield.

commanders throughout history have used sound to pierce the fog of war

Sound Across the Ages

Commanders throughout history have used sound to pierce the fog of war—or maintain it to their advantage, as in muffling cannon wheels. This century has seen greater scientific interest in sound. Flash and sound ranging equipment was perfected during World War I to direction find (DF) enemy artillery. Sophisticated electronic sensors such as the Italian passive acoustic location system (PALS), Swedish sound ranging system-6 (SOARS-6), and Russian standard SCHZ-6 acoustic artillery ranging system are being employed to triangulate and locate enemy batteries.

Early in World War II, air defenders on both sides of the English Channel used simple airplane noise detectors, like giant stethoscopes aimed at the sky, to locate, track, and even identify aerial targets and the direction of aerial movements. Although surprisingly effective, these devices were soon overtaken by the new technology of radar.

Medieval armies dug tunnels to penetrate fortifications. Sophisticated tunnel detectors still are used along the demilitarized zone in Korea. Soldiers have always sought an effective means of detecting underground sounds, the seismic subset of acoustic technology.

In Vietnam unattended ground sensors (UGS) included the air-deliverable seismic intrusion detection system (ADSIDS) and the remotely monitored battlefield sensor system (REMBASS), which included seismic, acoustic, magnetic, and infrared sensors to detect the movement of people and vehicles. These were tactically placed to track troops along the DMZ, Ho Chi Minh Trail, and elsewhere. Current wide area mine systems (WAMS) and artillery-delivered ground sensors also use seismic sound to detect target movements.

Even so, acoustics technologies emerging on the 21st century battlefield offer the prospects of a major leap forward from contemporary UGS and WAMS-type systems, just as the minié ball rifle of the Civil War surpassed the Brown Bess smooth-bore musket of the Revolutionary War. The new BAT submunition is just the tip of the acoustics iceberg. BAT represents only an initial step in the development of future acoustics sensor capabilities.

Seeking Acoustic Signatures

The distinctive aspect of the revolution in 21st century battlefield acoustics is not found in acoustics technology itself, but in advances in other unrelated, parallel technologies. Specifically, it comes from synergistic applications of developments in miniaturized, high-tech data processing capabilities which have appeared recently.

Earlier uses of acoustics amplified our natural sense of hearing by mechanical means. Later technology added sophisticated electronic amplifications of sound waves. However, this process was limited to simply making ambient sound audible to human ears so that people could respond. In the

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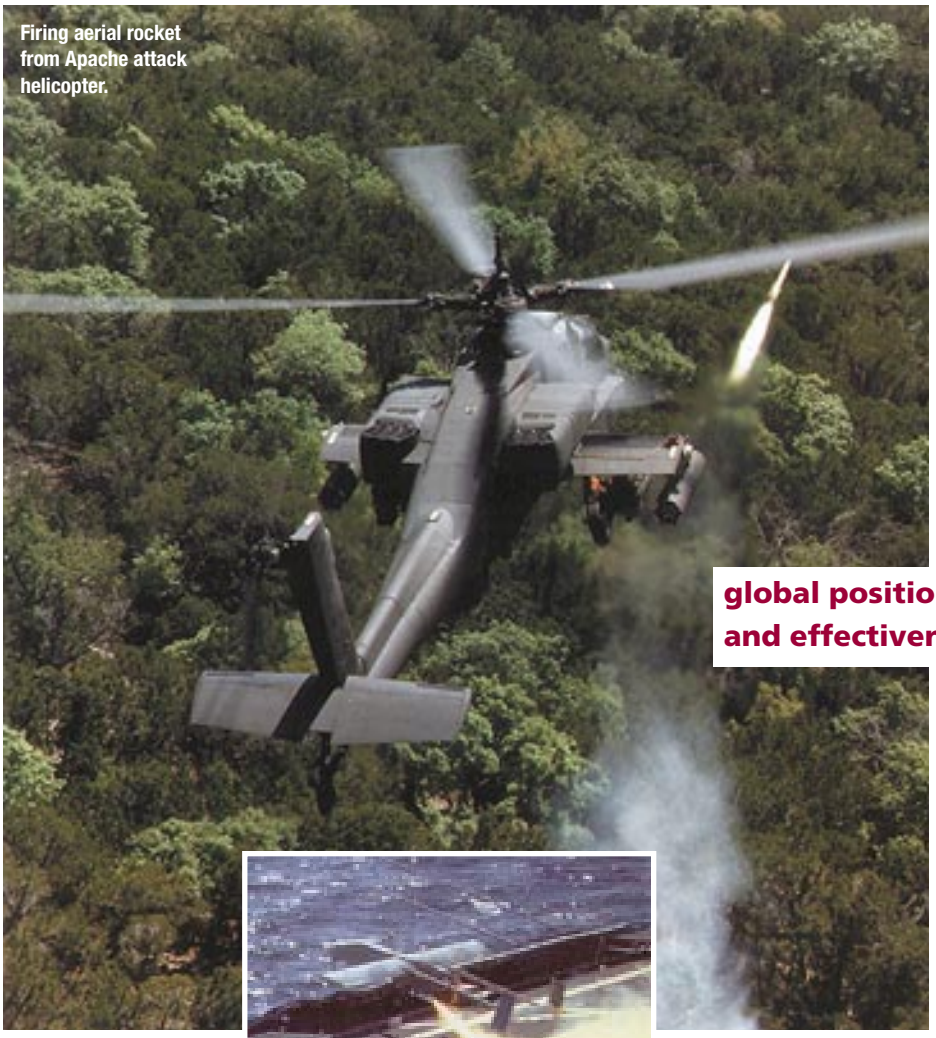

Firing aerial rocket from Apache attack helicopter.

McDonnell Douglas

Launching unmanned aerial vehicle from *USS Shreveport.*

U.S. Navy (Robert Scoggin)

case of listening posts, audio detectors, remote seismic detectors, and other devices, sound was detected and monitored by humans or electronically reported to have occurred, such as using remote UGS.

Recently developed artillery ranging systems and acoustic sensor munitions have only been incremental improvements. Sounds detected by sensitive directional microphones that are used in the PALS system are computer-processed to provide data readouts for its operators. When seismic sensors detect approaching targets, WAMS mines automatically dispense high-flying, sensor-fused submunitions to find and destroy them. Yet these systems only detect noise and respond to it.

The distinction between current systems and BAT technology is simple. Assisted by high-tech, miniaturized, high-speed, high-capacity, on-board data processing, the BAT acoustics system not only hears a target but analyzes sound waves. Using differentiating characteristics, BAT filters all sounds which its wide-open sensors acquire to focus on and attack selected targets. Moreover, as difficult as such target discrimination can be from a static ground platform, BAT sensors detect it from an air vehicle moving at high speed.

Operating acoustic sensors from a flying platform has challenged designers and engineers. If ground noise was undistinguished from platform noise, the system simply could not differentiate the sounds of various targets. Acoustics pioneers thus devised methods to distinguish platform or engine noise, in part by borrowing techniques and fancy signal data processing from radar. Using on-board microcomputers to manipulate noise parameters such as amplitude and phase, they could filter out self-noise from even high-speed, flying platforms like BAT. Once designers produced flying acoustic sensors that worked, various battlefield applications became readily apparent.

global positioning is bolstering the accuracy and effectiveness of high-tech weaponry

Taking practical advantage of acoustic weapons combined with the reconnaissance vehicles required the simultaneous, parallel development of microcomputer processing, including advanced miniaturization, that provided on-board computers with significant processing power and memory. The on-board computer facilitates the signal processing and acoustic signature matching. It also handles on-board mission planning and navigation systems for autonomous operations of potential unmanned aerial vehicles (UAVs) applications of acoustic sensor technology.

The increasingly ubiquitous global positioning system (GPS) is bolstering the accuracy and effectiveness of emerging, high-tech weaponry. Most missile and unmanned vehicle systems of the next century will be designed to function with GPS-based navigational systems and follow-on generations of this technology for convenience, accuracy, and effectiveness.

Ears to the Ground

The most significant aspect of synergistically developed acoustic weapons will be an ability to find and discriminate among targets using distinctive acoustic signatures. BAT submunitions launched from ATACMS or multiple-launch rocket system (MLRS)

munitions employ relatively simple capabilities to detect and home in on engine noises from enemy tanks. More sophisticated applications, such as acoustic anti-helicopter missiles described earlier, use acoustic-based sensors to detect and select a given target for which a missile is programmed. Once a target is selected, the missile homes in and destroys it.

Missiles on reconnaissance, surveillance, and target acquisition (RSTA) missions will be able to detect and identify targets that it has been programmed to recognize, report their locations to J-STARS or ground station modules, and perhaps cue sensor platforms to commence an attack or initiate more detailed intelligence gathering. This technology will turn precision strikes into ultra-precision strikes. The added accuracy and target discrimination made possible by advanced sensor systems will transform surgical operations into *arthroscopic* surgical operations.

many targets cannot operate without generating a detectable signature

The first step in the process of target acquisition, identification, and designation is to screen out ambient sounds. Acoustic receivers are always wide open and thus hear everything. Filtering ambient background noises makes it possible for further specific noise filtering and wave analysis. The self-noise generated by a vehicle engine and air turbulence created by movement of a vehicle is filtered out and identified during reception.

Remaining sounds are isolated by factors such as frequency and amplitude with detectable acoustic signatures plotted like visual graphics in a voice-based lie detector. The acoustic signature of a target type such as the T-80 tank, like human voiceprints, is distinctive—at least sufficiently for targeting purposes. For example, consider the success that the Navy had in the 1970s and 1980s using underwater microphones (or hydrophones) to collect the unique acoustic signature of submarines.

Next, a system must identify discriminating characteristics that distinguish the sound being monitored: frequency, harmonic frequency relationships, amplitude, and changes in frequency and amplitude. Such characteristics can identify a class of targets, a target type, or an individual target. Comparisons of incoming sound signals are made literally hundreds of times per second against unique characteristics of recorded targets. If a match does not occur, the unmatched target sensing is dropped, and the computer continues to seek matches for other signals. Given such a massive computational requirement, the importance of powerful, on-board computers is evident.

Another advantage of seeking acoustic signatures to locate and identify potential targets is that it adds yet another dimension to a threat. Like our own forces, an enemy can hide from visual detection behind camouflage nets or more substantial cover. Similarly enemy forces can hide from infrared detectors and remotely locate their antennas as well as use emission control to protect radio frequency emitters.

Sending Out Pings

Countermeasures will be attempted, but an enemy must hide its acoustic signature. Many targets cannot operate without generating a detectable signature. For example, tanks cannot move without running acoustically distinctive engines or making acoustically distinctive track noises. On the future battlefield acoustic factors may become the proverbial straw that breaks the camel's back when an enemy attempts to conceal its assets.

Target files, developed and preprogrammed in the mission computer of an acoustic missile, can be updated as required. The missile can be programmed to respond only to specific target sets. On the other hand, RSTA missions may require that an entire target list be left wide open in order to identify the full range of targets which a reconnaissance mission might encounter and report.

One constraint on acoustic-sensor weapon systems envisioned for the mid-term is that the sensors are passive. A column of tanks with its engines off may avoid detection by an overflying acoustic missile. Yet the next generation of R&D may address this handicap through a refinement of acoustic technology: active acoustic sensors. Operating like an aerial sonar, sending out pings and detecting returns from desirable targets, they could yield a greater magnitude of collection and accuracy capability to acoustic systems. An advanced WAMS could use acoustic sensors to locate, identify, and select targets. Another potential acoustic system might employ a network of active acoustic sensors seeded across an enemy rear area to report on movements and activities.

Future commanders must anticipate uses of more advanced technologies, especially missile delivery systems linked to acoustic technology which identifies, selects, and finds critical targets. Conversely, operational commanders must be able to defend against comparable capabilities.

Acoustic science is just one area of emerging high technology with applications for the next century. Analysis of its potential reveals rapidly developing trends and battlefield applications that such discoveries may offer or even impose. No nation can afford to ignore the accelerating march of such militarily applicable technology. Europe, Japan, and certain Third World nations have the skilled scientists and technicians who may discover the next war-winning technology. In the wake of the Gulf War, the Russians have acknowledged the importance of winning the information war and established information as a "fourth realm" of warfighting doctrine (after land, sea, and air).

The most successful commanders on the battlefield of the future will understand and apply integrated systems of advanced technology. Our most critical training mission is to ensure that our leaders understand and anticipate the potential and complexity of near future warfare. **JFQ**

JOINT WARFARE and Military Dependence on Space

U.S. Air Force

Computer generated composite map of Port-au-Prince using multispectral imagery from LANDSAT (inset).

Retaining the current international character of space will remain critical to achieving national security goals.

—*National Security Strategy*, July 1994

By JEFFREY L. CATON

THIRD PRIZE 95 REVOLUTION IN MILITARY AFFAIRS

After thirty-five years, space systems remain an integral part of national security. Desert Storm—which some regard as the first space war—represented the first widespread use of military space systems by common soldiers, sailors, marines, and airmen. It was also a harbinger of future military operations in which dependence on space-based force enhancement will continue to grow. This dependence by the Armed Forces on space systems reveals a vulnerability that an enemy with knowledge and expertise could exploit and concentrates on an ignored threat: countries with little or no space capability. The exploitation of space dependency can greatly benefit an unsophisticated foe by dramatically degrading our efficiency in combat.

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Figure 1. Criteria for Evaluating Space System Vulnerability

Criteria	Ability to Influence: U.S. Forces	Ability to Influence: Enemy Forces
Types of Space Systems in Use	Force Structure Availability/Quality of Alternate Means	Concentrate Attacks to Increase Specific Dependence
Extent of Space System Application	Force Structure Training	*Cannot Influence*
Enemy Means to Affect System Performance	Protection Countermeasures	Attack Ground Systems Electronic Warfare ASAT Attacks

Dependence

Military space operations were extensive as early as 1963.[1] Both the United States and the Soviet Union used space capabilities to observe strategic weapon systems, and that helped provide for a stable nuclear deterrence strategy. The use of space by the military has not been limited to strategic nuclear applications but has covered the conflict spectrum. A science adviser to President Reagan noted that "even in a very limited war, we would have an absolutely critical dependence on space today."[2] Indeed, space systems have played a crucial role in a number of limited operations: El Dorado Canyon (Libya, 1986), Earnest Will (the Persian Gulf, 1988), and Just Cause (Panama, 1989), to name a few.

Probably the best known military use of space occurred during Desert Shield/Desert Storm, when it greatly enhanced coalition effectiveness. Space systems provided support for navigation, weather, missile defense, communications, reconnaissance and surveillance, and target acquisition. As we face increasing global responsibilities with smaller forces, our ability to accomplish military missions will depend ever more on such force-enhancing support from space.

The dependence on a specific space system is linked not only to the availability of alternate means of performing system tasks, but also to the effectiveness and efficiency of those means.[3] Since space systems and their alternate means can be affected by outside forces, however, military dependence on space—the so-called *space dependency link*—is dynamic in a combat environment; that is, subject to constant change in its magnitude.

at least eight coalition civilian satellites were called upon during Desert Storm

Vulnerability

The ultimate objective of military space operations is the effective employment of space capabilities in support of land, sea, and air operations to gain and maintain a combat advantage throughout the operational continuum and across the three levels of war.

—Joint Pub 3–14, *Space Operations*

Two studies conducted by the Ford administration in 1976 concluded that the United States was growing dependent on satellites for various functions, with little provision for satellite survival during wartime.[4] While the studies concentrated on satellite vulnerabilities, it is important to look at vulnerabilities in joint surface forces (including air forces) that result from dependence on space. The extent of our space dependency link is based on three criteria: the types of space systems vital to ongoing operations, the extent of their use among our forces, and an enemy's ability to affect system performance (see figure 1).

Both the United States and its adversaries can influence the first criterion—the importance of a given space system to ongoing operations. We may affect it in our selection of force structure which, in turn, dictates the availability and quality of alternate means of performing system tasks. Since these alternate means may include assets from other countries, dependence on space systems extends to coalition operations. At least eight U.S. and coalition civilian satellites were called upon during Desert Storm to augment U.S. systems.[5] It can be expected that such systems would be "fair game" for enemy antisatellite (ASAT) efforts during wartime.[6]

An enemy can influence these criteria by conducting operations that increase dependence on a given space system. This may include physically destroying alternate means of task performance or simply concentrating their efforts to increase U.S. use of satellites.

The second criterion—scope of application—is influenced only by the United States. Once again, our force structure is the key player since it dictates the amount of surface-based equipment that is acquired and the level at which it is used. Space systems are well ingrained in our forces, as illustrated by three applications from Desert Storm: communications, navigation, and intelligence. Over a thousand single-channel, manportable satellite radio units were issued at small unit level. All told, satellites provided 85–90 percent of intratheater and intertheater communications. Also, thousands of global positioning system (GPS) receivers were used by coalition ships, planes, and ground

troops to navigate in unfamiliar and featureless terrain. Finally, each service supported an ongoing initiative called Tactical Exploitation of National Capabilities (TENCAP), which allowed joint-force tactical units to receive and sort intelligence data directly from space.[7]

The third criterion—enemy ability to affect system performance—can be influenced by both ourselves and adversaries. The United States can affect the enemy's ability to attack friendly space systems by using countermeasures for satellites.[8] These protective measures fall under the "space control" mission area. The objective is defending friendly space assets and denying an enemy use of his own. Currently, the popular view of space control emphasizes its role in the larger category of "information warfare." As such, space control strategies are geared more toward the protection and denial of satellite data than physical attacks on space system assets.[9]

An enemy might weigh the vulnerability of a space system to determine if the U.S. space dependency link could be impacted. How can an enemy take advantage of such vulnerabilities?

Exploitation

[Satellites] *would be so valuable to the overall order of battle that any opponent would have to take them into account in his overall battle plan and try to exploit any possible weakness.*[10]

Attacking our space systems could provide an enemy with excellent leverage by degrading our combat efficiency and effectiveness. An enemy who is not dependent on space systems (civil or military) can target ours with no fear of retaliation in kind. In such a case no space deterrence exists for the United States.

Enemies with no space capabilities can lease them. America may conduct diplomatic space control by encouraging states not to provide space support to foes. This occurred during Operation Desert Shield when France, working in collaboration with the coalition, agreed not to sell SPOT multispectral imagery data to Iraq.[11] But cutting off access to space data may make the targeting of U.S. space assets more attractive to an enemy. This may apply even to systems that have open access, such as GPS. Simply put, if the enemy cannot use space or must use it at a disadvantage, he can only gain by knocking space systems out.

The equipment and tactics required for attacks on ground systems by conventional, special operations, and terrorist forces are readily available. The equipment for certain ground-based, air-based, and sea-based electromagnetic jamming also is obtainable from many countries, especially the former Soviet Union (FSU). Methods of attack against the space segment include direct ascent and coorbital weapon systems and directed energy beams that can disrupt or destroy satellites.[12] FSU has demonstrated several types of ASAT systems, and this technology may become available to aggressor nations.

Feasibility of Attack

One method of electromagnetic disruption is the high-altitude detonation of nuclear devices. Three series of high-altitude nuclear tests conducted by the United States between 1958 and 1962 (see test summary in figure 2) demonstrated electromagnetic phenomena that affected space operations: widespread ionization, electromagnetic pulse (EMP), and artificial auroras.[13] Of particular interest was the "argus effect," named for the shell formed around the earth by beta particles after a nuclear detonation. Trapped radiation from the test explosion with the largest yield, *Starfish Prime* which had a 1.4 megaton warhead, inadvertently damaged at least three satellites.

Figure 2. High Altitude Nuclear Tests, 1958–62

Test Series/Date	Test Name	Warhead Yield	Explosion Altitude
HARDTACK			
1 Aug 58	*Teak*	megaton range	~ 48 miles
12 Aug 58	*Orange*	megaton range	~ 27 miles
ARGUS			
27 Aug 58	*Argus 1*	1–2 kiloton	125–300 miles
30 Aug 58	*Argus 2*	1–2 kiloton	125–300 miles
6 Sep 58	*Argus 3*	1–2 kiloton	125–300 miles
FISHBOWL			
9 Jul 62	*Starfish Prime*	1.4 megaton	248 miles
20 Oct 62	*Checkmate*	submegaton	tens of miles
26 Oct 62	*Bluegill Tripleprime*	submegaton	tens of miles
1 Nov 62	*Kingfish*	submegaton	tens of miles

Source. Defense Nuclear Agency.

ballistic missiles can optimize the apogee for ASAT effectiveness

The overall ASAT system concept was proven by the 10th Aerospace Defense Squadron at Johnston Island in 1964–1975.[14] Successful operation of this unit required years of research and testing. The many challenges for an enemy to develop and operate such a system can be divided into three areas: tracking and targeting, delivery, and warhead.

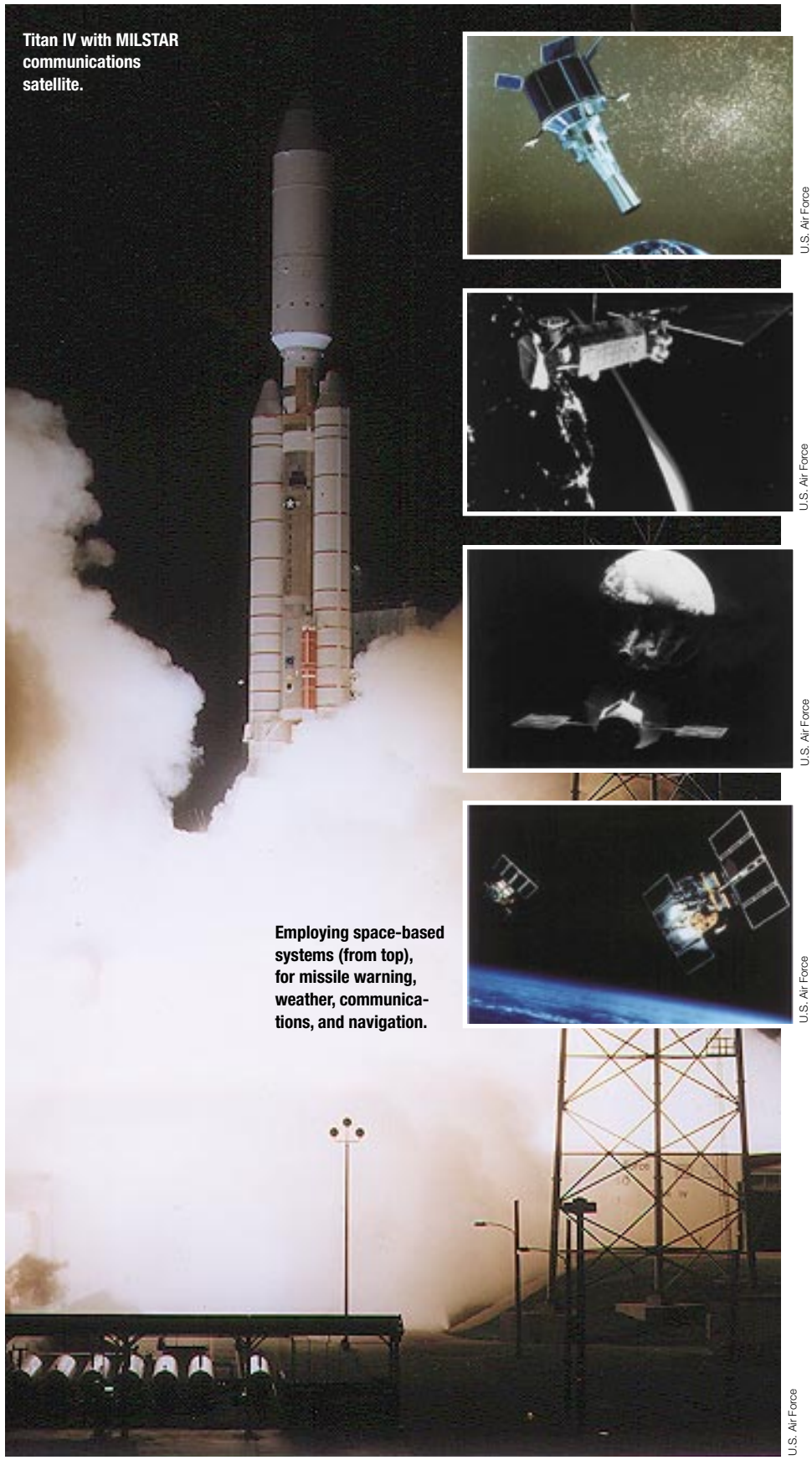
Tracking and targeting a satellite is often considered an expensive process that requires an immense infrastructure and highly qualified technical personnel. However, the Kettering group, an informal network that monitors space activities, has proven that it can be done using common and inexpensive electronics with minimal training. For example, in 1978 a 12-year-old student at Kettering Boys School, with the aid of his physics teacher (a Kettering group member), predicted within a 24-hour range when the Cosmos 954 satellite would reenter the atmosphere. The

group also was credited with discovering the then-secret Soviet launch facility at Plesetsk in 1966 as well as tracking Soviet spy satellites that were observing the 1967 Arab-Israeli War.[15] In both cases the tracking was done without modern calculators and personal computers. Today, an enemy can purchase commercial software packages to calculate orbital mechanics and can access the computer Internet to obtain the orbital parameters of satellites. Using this information, tracking and targeting a nuclear ASAT within its effective radius (usually measured in miles[16]) is certainly feasible.

Once a target is selected, a delivery vehicle must place the warhead in a given effect radius. Not including countries with established missile programs (namely, the United States, countries of the former Soviet Union, France, China, and Great Britain), there are at least 22 states with active ballistic missile programs.[17] Ballistic missiles can be developed to optimize the apogee for ASAT effectiveness. Technological hurdles to the development of missile systems may be overcome with the help of FSU workers for hire: NPO Energomash, Russia's leading developer of liquid-fueled rocket engines, lost much of its experienced staff in September 1993.[18]

Hiring expertise could also help develop space hardware for the final guidance and control of warheads. But generating a satellite bus was another task accomplished by a group of amateur radio enthusiasts who designed, constructed, and operated six satellites. Built mostly in their garages, the first orbiting satellite carrying amateur radio equipment (OSCAR 1) was launched in December 1961. The design and performance of the OSCAR series have improved over time, yet the majority of the work is still done by amateurs using their own resources.

The final challenge to operating a nuclear ASAT is acquiring a warhead. Though difficult, developing or procuring nuclear weapons is feasible enough that our national security strategy lists their proliferation as a major concern. A recent Air Force study estimated that in 1993 as many as 10 countries were capable of producing nuclear weapons.



Titan IV with MILSTAR communications satellite.

Employing space-based systems (from top), for missile warning, weather, communications, and navigation.

U.S. Air Force

U.S. Air Force

U.S. Air Force

U.S. Air Force

U.S. Air Force

This could increase to 25 by 2003.[19] A separate probe by a government proliferation study team estimated that eight third world countries would be added to the list by 2000.[20]

Effects

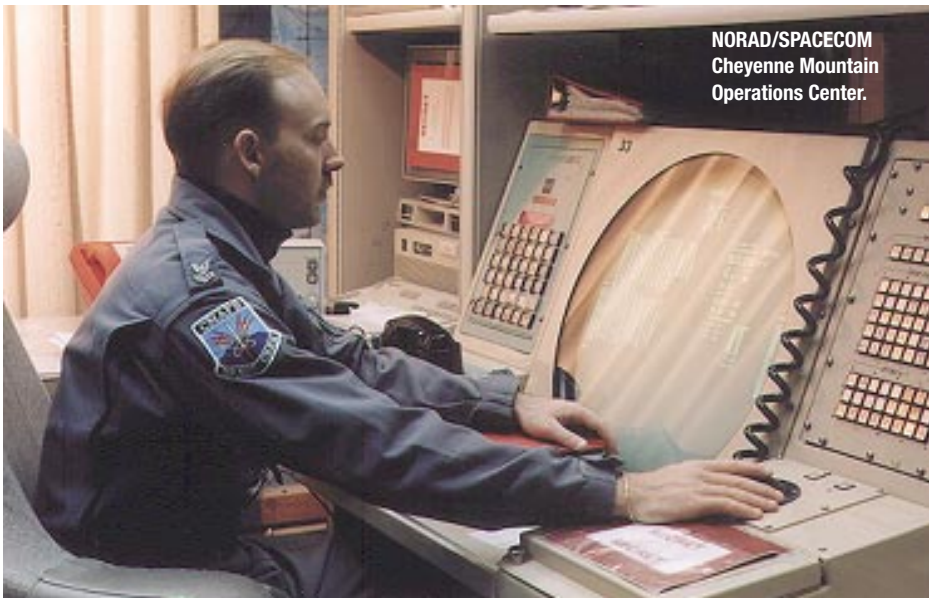
Spending billions in space makes little sense if the assets are unusable in wartime.[21]

An attack on our space assets could impact every element of national power—political, diplomatic, economic, and military. During conflict, a priority of any commander is to prepare the battlespace[22] for combat operations—that is, to "stack the deck" to his advantage. An enemy has much to gain by exploiting the dependency link between our terrestrial forces and force-enhancing space systems. An assault on U.S. military space systems is a force multiplier for an enemy.

If prepared, the Armed Forces could probably operate in remote theaters without the aid of space systems. However, based on the increasing strength of space dependency links, they would have problems operating under the *immediate and unexpected* loss of critical space support, which would give at least temporary advantage to an enemy. That edge could increase by synchronizing attacks on space systems with assaults on terrestrial forces. While this may not enable an enemy to triumph militarily, it may cause loss of life and materiel sufficient to bring our withdrawal.

Bang for the Buck

The most effective and least defendable method of attack against space systems is the high-altitude detonation of a nuclear device.[23] Depending on the yield of the warhead, a nuclear ASAT could attack multiple satellite systems with one detonation. Such an attack would have temporary and permanent effects on U.S. forces. Depending on the design and operating radio frequency of the target, temporary effects could last minutes, hours, or days. These effects can be used to great advantage. If an enemy plans an offensive with the high-altitude nuclear environment in mind (for example, EMP, atmospheric ionization), it can opt to outfit troops with low-tech equipment and procedures that would be unaffected by such an attack. Devices such as signal flags, compasses, and presurveyed attack routes could be turned into enemy force enhancers that exploit GPS navigation and satellite communication links that are suddenly severed. An enemy could thus strengthen the synergistic synchronization effects of his terrestrial attack.



NORAD/SPACECOM Cheyenne Mountain Operations Center.

SPACECOM (Carol Floyd)

A nuclear ASAT can destroy or damage satellites in its kill radius. As a consequence of the inadvertent satellite damage caused by the *Starfish Prime* nuclear test, it was obvious that nuclear ASATs would have limited usefulness because of unavoidable collateral damage they would inflict on other U.S. satellites.[24] While such damage may concern us, it is of great benefit to a country which is not space dependent. Without penalties—indeed with benefits—for collateral damage, an enemy can pursue indiscriminate area targeting that allows less sophisticated targeting and delivery systems for its ASAT.

The permanent damage to satellites may introduce secondary damage mechanisms that would benefit an enemy. Even though space is vast, many of the useful orbits to support given areas on earth are heavily populated by satellites. This "bunching" could allow secondary satellite kills through debris fratricide. This could have a cascading effect as new collisions create more debris.[25] The bottom line is that an enemy need not possess space forces to be a space threat.

The use of any nuclear device is likely to have significant political implications. While it may be acceptable to direct such a device at inanimate objects, the indiscriminate nature of ASAT may not be acceptable to neutral countries whose space systems and related economic links may be impacted. But faced with an enemy who has a low regard for world opinion (a Saddam Hussein or Mu'ammar Qadhafi), these factors may have little effect on enemy strategy. Given that reality, how can we best prepare against such a threat?

Countermeasures

In considering countermeasures against threats to space systems, the objective is to assess all elements of a system for vulnerabilities and provide survivability measures. Proliferation and reconstitution measures can then be added to ensure continuous capability on all levels of conflict.

As microelectronics become more sophisticated, they are more vulnerable to radiation. The radiation level needed

to produce instantaneous failure in circuits today is two orders of magnitude *less* than in the 1970s. Worse, domestic vendors who produce radiation-tolerant semiconductors fell from twenty in 1990 to four in 1995. DOD investment in radiation-hardening technology also dropped, from $50 million in 1989 to $20 million in 1995.[26]

reconstitution through space launch offers promise as a countermeasure

Equipment hardening and autonomy can reduce electromagnetic and radiation interference from ASAT attacks. However, hardening countermeasures would offer little protection from blast and debris damage. Also, the ability to maneuver may be of little use since there would be only a few minutes for ground operators to observe the ASAT launch, assess intent, determine its target, and command the target satellite to avoid the impact area. But such maneuver capability may be useful for an untargeted satellite to avoid a fratricide threat resulting from a successfully targeted satellite.

The use of on-orbit spares (proliferation) confronts the enemy with more potential targets. However, since some of these spares may have to be in orbits similar to the target satellites to be effective, they may also be vulnerable to fratricide.

Reconstitution through space launch offers promise as a countermeasure. As one analyst observed, "reconstituting essential space assets after hostilities begin may be the only method of ensuring that critical systems survive."[27] While reconstitution would not be effective in preventing an enemy's initial operations, it would allow for satellites to be reintroduced into the battlespace, possibly in support of U.S. counteroffensive operations.

Finally, one of the best countermeasures, training, is not directly related to space systems. Future joint and coalition training should insert unexpected interruptions of space systems support. Our forces should identify and practice alternate means of conducting operations which normally include space dependency links.

The military use of space is a double-edged sword with strengths as well as vulnerabilities. Faced with growing responsibilities and decreasing forces, our ability to accomplish missions will depend more and more on force-enhancing support from space. The resulting vulnerability may be affected by both the United States and a potential enemy. Developing countermeasures to threats against our space systems may enable us to avoid a needless loss of lives and equipment on the battlefield of the future. JFQ

NOTES

[1] Paul B. Stares, *The Militarization of Space, U.S. Policy, 1945–1984* (Ithaca, N.Y.: Cornell University Press, 1984), p. 240.

[2] Quoted in Paul B. Stares, *Space and National Security* (Washington: The Brookings Institution, 1987), p. 46.

[3] Stares, *Space and National Security*, p. 47.

[4] Stares, *The Militarization of Space,* pp. 169–70.

[5] Peter Anson and Dennis Cummings, "The First Space War: The Contribution of Satellites to the Gulf War," *RUSI Journal,* vol. 136, no. 4 (Winter 1991), p. 49.

[6] Stares, *The Militarization of Space,* p. 248. Also see George F. Jelen, "Space System Vulnerabilities and Countermeasures," in *National Interests and the Military Use of Space,* William J. Durch, editor (Cambridge, Mass.: Ballinger Publishing Co., 1984), p. 90.

[7] David A. Fulghum, "Talon Lance Gives Aircrews Timely Intelligence from Space," *Aviation Week and Space Technology,* vol. 139, no. 8 (August 23, 1993), p. 70.

[8] Robert B. Giffen, "Space System Survivability: Strategic Alternatives for the 1990s," in *International Security Dimensions of Space,* Uri Ra'anan and Robert L. Pfaltzgraff, Jr., editors (Medford, Mass.: Archon Books, 1984), pp. 87–92, discusses satellite countermeasures.

[9] Robyn A. Chumley, "Supporting the Warfighter," *Airman,* vol. 38, no. 11 (November 1994), p. 35.

[10] Gregory H. Canavan and Simon P. Worden, "Military Space in the Next Century," lecture to Air University Spacecast 2020 Team, Air War College, Maxwell Air Force Base, Ala., 1993, p. 10.

[11] Patricia Gilmartin, "Gulf War Rekindles U.S. Debate on Protecting Space Systems Data," *Aviation Week and Space Technology,* vol. 134, no. 17 (April 29, 1991), p. 55.

[12] Jelen, "Space System Vulnerabilities," pp. 91–95.

[13] Samuel Glastone and Philip J. Dolan, editors, *The Effects of Nuclear Weapons,* third edition (Washington: Government Printing Office, 1977), pp. 45–48, 71–77, 461, 487, 518–23; F.R. Gladeck et al., *Operation Hardtack I–1958,* DNA report 6038F (Washington: Defense Nuclear Agency, December 1, 1982), pp. 257–73; C.B. Jones et al., *Operation Argus 1958,* DNA report 6039F (Washington: Defense Nuclear Agency, April 30, 1982), pp. 58–72.

[14] Curtis Peebles, *Battle for Space* (New York: Beaufort Books, 1983), pp. 85–94.

[15] Doug Stewart, "Satellite Sleuths," *Air and Space,* vol. 5, no. 2 (June/July 1990), pp. 27–34.

[16] Peebles, *Battle for Space,* pp. 88–91. The reported satellite killing radius for the 10th Aerospace Defense Squadron was five miles. During two CEL tests the ASAT simulated warhead passed within 0.89 and 2.019 nautical miles, both highly successful.

[17] Thomas A. Torgerson, *Global Power Through Tactical Flexibility: Rapid Deployable Space Units,* Airpower Research Institute Research Report no. AU–ARI–93–6 (Maxwell Air Force Base, Ala.: Air University Press, 1994).

[18] Jeffrey M. Lenorovitz and Boris Rybak, "Engineers Flee Low-Paying CIS Jobs," *Aviation Week and Space Technology,* vol. 139, no. 13 (September 27, 1993), p. 53.

[19] Headquarters, U.S. Air Force (AF/XOXI), briefing entitled "Countering Weapons of Mass Destruction Proliferation" (1993), p. 5.

[20] Torgerson, *Global Power*, p. 16.

[21] Giffen, "Space System Survivability," p. 100.

[22] *Battlespace* is replacing *battlefield* in military lexicons and is taken to be the logical extension of battlefield into all dimensions and media of operation.

[23] Stares, *Space and National Security,* p. 77.

[24] Stares, *The Militarization of Space*, p. 108.

[25] Canavan, "Military Space," p. 12.

[26] R.C. Webb et al., "The Commercial and Military Satellite Survivability Crisis," *Defense Electronics*, vol. 27, no. 8 (August 1995), pp. 21–25.

[27] Giffen, "Space System Survivability," p. 92.

THE 1995 RMA ESSAY CONTEST

The *JFQ* "Essay Contest on the Revolution in Military Affairs" was conceived in late 1993 to encourage innovative thinking and writing on serious changes in the conduct of war that many analysts predict for the coming decades. A total of 70 essays were forwarded to a panel of judges. Both the number of entries and the range of contributors reflected a much wider and deeper interest in RMA than anticipated. This initial success has led to a decision to conduct a second contest in 1996 (see the announcement on page 19).

The Contestants

A total of 75 individuals, including 69 men and 6 women, were authors or coauthors of the essays (three submitted multiple entries). Of this number, 59 were members of the Armed Forces: 44 active, 9 Reserve, and 6 retired. Among these military contestants were 28 active and Reserve officers or officer candidates in the grade of O4 and below including enlisted personnel from each service. The overall breakdown, both active and Reserve, was 16 Army, 16 Navy, 24 Air Force, and 3 Marine Corps. Of the 14 civilian entrants, 6 were DOD employees. Moreover, two foreign officers were among the contestants.

The Essays

The 70 essays reflected a broad range of RMA-related issues. Most supported the contest's major suppositions: that we are in the midst of a technology-based military revolution and that the key to military leverage is adopting new operational and organizational concepts. A few essays presented an alternative view that the revolution is an essentially socio-political phenomenon which will be characterized by the predominance of low-intensity conflict and non-nation-state enemies.

Most contestants saw the revolution as an expanded opportunity rather than a growing risk. Their assumption was that the Nation can maintain a significant technological lead over prospective enemies and also leverage this lead to profound military effect if it so chooses. On the other hand, a number of authors took the significant future threat to be the increasing availability of high-tech military capabilities to less-developed nations. In their view, there is a real danger that states with conflicting values may exploit U.S. and Western vulnerabilities using highly lethal systems. Such potential enemies may be less concerned about casualties, collateral damage, or conflict escalation.

Some essays addressed new technologies—such as microsystems and biotechnology—but a majority focused on operational and organizational issues emanating from information and long-range precision strike systems. These and other themes on the future of warfare were articulated in the essays.

Operational Issues

Strike effectiveness through long-range precision strike and information technologies will greatly increase the future vulnerability of large signature forces. Emerging sensors will reveal far more about the battlespace as weapons strike with greater accuracy and lethality at virtually unlimited ranges. Survivability will require speed, stealth, and mobility. Only one essay predicted that vastly improved battlefield defenses might effectively nullify long-range precision strike.

Span of conflict in the next century will increase demands on the Armed Forces to deal with an ever wider spectrum of threat, ranging from operations other than war to wholly new types of high tech, high intensity combat. The essays entered in the contest reflect a divergence of opinion regarding whether a common force structure exploiting RMA technologies will be able to deal with both types of conflict, or whether very different kinds of forces will be needed for each threat.

Time as reflected in an improved information flow will result in vast increases in the tempo of operations, which will lead to faster command cycles. One result will be to merge the strategic, operational, and tactical levels of war as sequential operations give way to simultaneous or parallel operations. Some predict that wars of attrition will be reduced to a short series of engagements.

Information domination will be increasingly critical for battlefield success. Many foresee the predominance of information operations over strike and maneuver. To some, the cyberworld will become an independent theater of warfare. One writer even predicted the possibility of future "bloodless" victories through battlefield cyberwar, while several envisioned prospects of bloodless strategic defeat for the Nation resulting from the vulnerabilities of an information-based society.

Space control will be increasingly critical to battlefield success. Some see American dominance in space offering relative advantages over the long term, while others see an asymmetric U.S. reliance on space as a critical vulnerability. The emerging importance of space may result in its becoming an independent theater of warfare.

Organizational Issues

Smaller and lighter: Information and strike technologies will provide much greater combat effectiveness to smaller systems and units. This capability, and the need to reduce unit signatures, will result in smaller, lighter, and more mobile forces—with more flexible organizational requirements.

Function over form: RMA operational needs will result in less service-specific and more function-specific approaches such as standing joint commands on the tactical level. Jointness and the traditional view of individual services will become outmoded. In their place functionally based commands will focus on space, information, strategic operations, mobility, etc.

Increased automation of traditional command and control functions will be required because of the faster tempo of battlefield operations. New roles will have to be found for decisionmakers in a system that processes information more quickly than it can be assimilated and acted upon.

Virtual organizations. Information technology—especially vast increases in communication bandwidths—will allow real-time networking of many units and individuals, regardless of physical location. Traditional command hierarchies may prove too cumbersome for system requirements. We may see the growth of virtual organizations—especially reconnaissance strike complexes—that define themselves by function and capability instead of seniority and service relationships. One of the essays advocated complete elimination of formal battlefield hierarchies, allowing the networked system itself to naturally define the most efficient future organizational structures.

A number of the essays focused on the need for more innovation in the military to deal with the challenges of RMA. One made a case for a process of evolutionary development while another saw a necessity to skip a generation and leap into RMA. Still others centered on institutionalizing the process of innovation as well as dealing with cultural impediments to organizational change.

The entries in the 1995 contest offered much food for thought and, in many critical areas, reflected a wide divergence of opinion on the dominant aspects of the future of warfare. These essays as a group also posed a number of intriguing theoretical questions:

- Assuming a tech-based RMA, can we choose our future? What are our deterrence and warfighting goals? What specifically can we achieve through this revolution?
- To what extent will technology itself determine future change? Where will it lead us?
- Will our enemies be the first to achieve an RMA by using technologies that exploit our vulnerabilities? If so, will they redefine warfare?

The Winners

The judges included officers of all services as well as senior civilian officials. Each judge was familiar with the broad range of historical and recent issues and literature surrounding RMA. A blind judging process was used. The editor of *JFQ* masked the identities of entrants before their essays were passed to the panel and the names were not revealed until a determination on the prize winners had been finally reached.

The contest rules stipulated three questions that were to be "rigorously addressed." While no entries that met the basic contest rules were dismissed out of hand, the judges looked for quite compelling arguments in considering essays that departed from the announced contest parameters. The entries that fared best and were considered competitive (including many that were not selected) tended to meet two criteria:

- They offered clear guidance on linking RMA theory with real choices and decisions that will need to be made in the future. (While these were some intriguing theoretical pieces, they did not fare as well as the more practical approaches.)
- They tended to be focused on long-range change, particularly concepts and organizations for exploiting technology.

Although only three prize winners were named, a number of other entries were considered highly competitive, two of which appear herein.

JFQ

RMA Essay Contest Award Ceremony

The Vice Chairman, Admiral William A. Owens, presented awards to winners in the first annual *JFQ* "Essay Contest on the Revolution in Military Affairs" in a ceremony held at the Pentagon on January 11, 1996. Cosponsored by the National Defense University Foundation and the Office of Net Assessment, the contest solicits innovative concepts for operational doctrine and organization by which the Armed Forces can exploit emerging technologies.

Prizes of $2,000, $1,000, and $500 were awarded for the three top entries. The cash awards were made possible by contributions to the National Defense University Foundation from Northrop Grumman and SAIC. First prize was presented to Ensign Thomas G. Mahnken, USNR, for "War in the Information Age" (in addition, he won a $500 prize for the best essay by a junior officer). Lieutenant Colonel Marvin G. Metcalf, ARNG, took second place for "Acoustics on the 21st Century Battlefield." Finally, Major Jeffrey L. Caton, USAF, received the third prize for "Joint Warfare and Military Dependence on Space." All three essays are published in this issue. JFQ

Joint Chiefs of Staff (Marnie M. Burke)

Award ceremony participants: Caton, Metcalf, Mahnken, and Owens.

Time

The New Dimension in War

By AJAY SINGH

Success and failure in war—as in most human endeavors—rests on the ability or failure to create and exploit asymmetries in capabilities and action. These asymmetries result from a process of technological revolution and evolution, based on microrevolutions, and generalship that exploits them in time and space. Methods of warfighting undergo changes through microrevolutions that are usually driven by innovations such as the stirrup, crossbow, gunpowder, steamship, wireless, et al. A revolution in military affairs (RMA) occurs when there are essential changes in the nature of war requiring a reassessment of the way we plan and conduct warfare. This revolution displays a shift in the center of gravity of military activity. The common denominator is a growth in either mobility or firepower, or both, that increases the premium on time and space. Throughout history time and space have been played against each other to gain advantage in battle. With the passing of the years, time has gradually been compressed while space has expanded.

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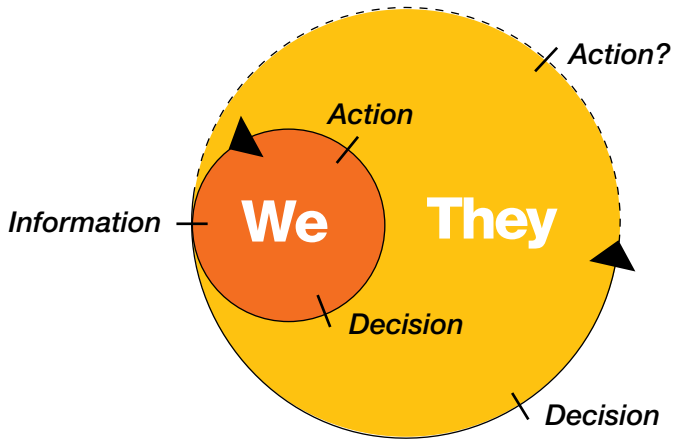
The pace of war has changed little over the centuries, and therefore warriors did not really experience the compression of time. With the advent of airpower, warfare expanded into a third dimension, and the process of creating asymmetry was lifted to a new dimension. Airpower thus constituted an RMA, the impact of which started to be felt with the end of World War I. Today we are at the threshold of new technologies which promise to enlarge the battlefield even more and shrink the time available for decisionmaking and action to critical levels. Their net effect—whether long-range weapons or information warfare technologies—will be to tighten the decision loop until an asymmetry created in time proves to be decisive. This new revolution can therefore be termed the advent of the fourth dimension—*time*.

IDA Cycle in "T time"



Note: The continuous line in the figure represents "T time" which is the time to complete the cycle. For an enemy, the time to complete the cycle is "T plus time" which leads to a time differential that causes a lag in its response with resulting adverse asymmetry.

Two-Dimensional Warfare

For centuries war was confined to two dimensions, breadth and depth. Combat at sea and on land remained limited to these two dimensions even as the area of battle expanded. Subsurface warfare at sea did not alter the basic dimension, although it did expand conflict in space. Advances in military technology primarily contributed to increased mobility and firepower in terms of depth and breadth. Many technological advances led to an impact on the methodology of warfighting and thus can be called microrevolutions. Their effect enhanced speed and lethality in battle, though the results were spread over time, perhaps centuries.

One early microrevolution was the expansion of the battlefield by cavalry. With enhanced mobility, forces could engage at longer ranges more quickly. This was the way in which Mongol cavalry swept across Asia. Another microrevolution was the stirrup, giving horsemen enhanced firepower on the move.[1] The English longbow and 10th century crossbow also caused changes in tactics. Gunpowder in the 15th century further increased firepower, while the grooved rifle which was fielded during the Civil War increased accuracy and further expanded the battlefield, although within existing limits of time and space.

The Industrial Revolution heightened the pace as well as intensity of combat, which led to greater lethality and to the industrialization of war. The tank, introduced in World War I, included elements of enhanced mobility and firepower in a single vehicle, although its real significance was not recognized until World War II when combat became even more violent. Armored warfare, however, was confined to the dimensions of breadth and depth, and continued to require the forces of one nation to defeat those of another to impose its will. Though many developments had taken place over the centuries, warfare remained tied physically to the surface (either on land or at sea), and was hence two-dimensional. It was the acceleration of technological changes beginning in the 20th century that led to a major revolution in the nature of warfighting.

airpower extended warfare into the third dimension, making it possible to target a nation directly

Third Dimension

The advent of airpower extended warfare into the third dimension, making it possible to target a nation—and its will—directly and thus conquer territory without destroying enemy forces. That began with the aerial bombardment from Austrian balloons during the siege of Venice in 1849 which led to calls for a permanent ban "on the discharge of any kind of projectile or explosive from balloons or by similar means" at the Hague in 1899.[2] While the ban was not adopted, destruction from the air clearly heralded a fundamental change in military affairs. Ten years before the flight of the Wright brothers, J.D. Fullerton of the British army's Royal Engineers spoke of a "revolution in the art of war" where "the chief work will be done in the air, and the arrival of the aerial fleet over the enemy's capital will probably conclude the campaign."[3] Other strategists such as Douhet and Mitchell elaborated on the concept later, but they were more prophets than strategists.[4]

Although forerunners of the third dimension recognized the impact airpower would have on war, technology did not mature in the earlier decades to a level where it had a revolutionary effect. It was a case where doctrine ran ahead of technology, giving rise to

misgivings and skepticism. Much of the problem in understanding airpower even today is due to the fact that landpower and seapower doctrine is based on centuries of experience while airpower is only a hundred years old. But if our understanding of airpower has been clouded for these reasons, Fullerton's vision of the third dimension as a revolution in warfare has been amply vindicated over the last century.[5]

Airpower had developed sufficiently by World War I that it could be employed in combat. Between wars, it matured enough to contribute substantially in World War II, and warfare in the surface medium (including subsurface) could not keep pace with changes in the third dimension. The maturing of technology in World War II facilitated use of doctrine envisioned in earlier years. One classic example of the revolutionary impact of airpower was the *Blitzkrieg* concept, where dive bombers leading *panzer* thrusts rapidly destabilized and disrupted defenses into defeat.[6] The Battle of Britain changed the course of the war itself, resulting in the cancellation of German plans for the invasion of England. The ability of airpower to target surface forces from the third dimension was an influence on the surface battle, especially in the North African campaign.[7] Besides its offensive employment for destruction, the third dimension airlifted troops and materiel, thus enhancing the mobility of surface forces by air transport or airborne operations. Creating major asymmetries in time and space by exploiting the third dimension literally lifted traditional two-dimensional warfare to nonlinear dimensions. The struggle to control the third dimension itself became a major military aim.[8] Strategic bombing may not have achieved the expected objectives, but the atomic bombing of Hiroshima finally established what the prophets had forecast.

The intensity of the revolution continued into the nuclear age, with significant advances in levels of technology. The most obvious fallout in the post-war era was a total shift in the currency of power to the third dimension through nuclear weapons that were air deliverable. The increased use

AWACS.

U.S. Air Force

of the electromagnetic spectrum and a move toward more accurate aerial weapons profoundly affected warfighting. Though the electromagnetic spectrum was significant during World War II, its exploitation matured in Vietnam when precision guided munitions (PGMs) made an operational appearance. The maturing of electronic warfare is a microrevolution in military affairs and a subset of the third dimension since it is primarily conducted through, for, and against activities in the third dimension.[9] While PGMs provide greater accuracy and timeliness, they must be backed through reconnaissance, surveillance, and target acquisition (RSTA) technologies to be effective. Increased military use of space has led to a scenario of space-based weapons and defenses. A move toward continuous asymmetry above the earth was evident in the SDI technology of the Reagan era.[10]

The last hundred years of warfare in the third dimension has clearly shown that airpower (including space) has fulfilled its promise of being a true revolution. It is dominant in combat; and while it may not achieve victory alone, airpower is nevertheless essential to winning a war. Even in Vietnam it was not that airpower failed as some claim; it was an ill-defined threat combined with unclear political objectives that fettered the third dimension. Airpower remained critical as seen in the defense of Khe Sanh or in Linebacker II.

Around the same time, the Arab-Israeli war proved that airpower had the potential to decide the outcome of surface war. In the 1982 Bekaa Valley operations, Israel used the third dimension in a decisive manner.[11] This was repeated by the U.S.-led coalition in the Persian Gulf War, albeit on a larger scale. This was also perhaps the first war when information was employed extensively to create conditions conducive to victory. Satellites provided real-time information to operational commanders. U.S. Space Command assets were critical for cuing Patriot batteries. Time was of importance in such missions and all efforts were made to obtain real-time information, whether for targeting Scud launchers or battlefield targets. This war was the first where real-time information was a reality, and the results indicated that the time had come for it to play a crucial role in combat. While the coalition benefitted from compressed time-cycles, Iraqi time-cycles had distended to such a degree that they became totally irrelevant. This war was for all practical purposes a combination of the potency

of the third dimension and the use of sophisticated technology to shrink the time for decision-action synergy. To that extent, this war was the overlap in which signs of another RMA could be seen—the advent of the fourth dimension of war.

Fourth Dimension

The nature of the battlefield is undergoing transformation. Fully automated warfare may be technologically feasible in the next twenty years.[12] Airpower has provided a dynamic platform for change. Its early signs were apparent in the Bekaa Valley where nonlinearity from technological advances helped to destroy Syrian forces at the front and to stop the Syrian 3d Armored Division in its tracks before it reached the battle. The doctrine was incorporated in the AirLand Battle concept, which spoke of an extended battlefield where airpower would engage follow-on forces and enemy targets in depth. During the Gulf War the indications were much clearer that future conflict would involve extensive use of technology to conduct the battle at extended ranges and compressed time. With further advances in technology, the battlefield can be expected to expand even more. Hitting targets at long range with precision RSTA technologies is critical and translates into the accuracy and time sensitivity of information. While accuracy is a matter of acquisition and guidance sensor technologies, time on the expanded battlefield needs greater attention. Technologies of the future may provide highly accurate information which satisfies needs on all levels of war, although if it is not timely it could be worthless. The result will be a new dimension—time—which promises to envelop the other dimensions of war as a force multiplier and counterforce divider.

time promises to envelop the other dimensions of war as a force multiplier

Although time has always been a factor in war, technology has never been at a stage where it could play an independent and dominant role in shaping conflicts. The slow pace of war when it was confined to two dimensions also meant that the human decisionmaking loop was never pushed to its time limits by the demands of battle management. It was not that time did not play a key role; rather, the advantage offered by timely information was often overshadowed by the relatively large time required to act on it. Notwithstanding this, time has always been crucial to surprise.[13]

Reorienting the IDA Cycle

With the inherent mobility and firepower of airpower, the expansion of war to the third dimension largely changed the factor of time. The dimension of time began to be recognized as more important, and conscious efforts were made to reduce the time required to gather information, disseminate it, make a decision, and follow it up by action. In the 20th century, rapid technological advancement has reduced the span needed to know, decide, and act with the result that time has been shrinking, while space (the extent of the battlefield) has been expanding. This may lead to a state of seamless space, where borders become even less relevant in the conduct of war, and time assumes the form of boundaries. This border of time will be the decisive factor of war and will call for orienting the information-decision-action (IDA) cycle in terms of time.

The IDA cycle is a basic element of the dimension of time in military affairs and represents a set of activities required in all of them. The size of the loop is a demonstration of the time taken to achieve a specific task. The faster this cycle is completed, the greater the compression of time. The aim, when operating in this dimension, is to shorten the cycle as much as possible and thereby retain the advantage of time over an enemy. It is important to understand that each component of the cycle has its own subcycles and, accordingly, the time needed for a given task is the sum of the time required to complete each of the subcycles and the overall cycle itself.

Some tasks may call for completing a number of cycles before the action reaches finality. The time dimension will then be that much more dilated compared to single-cycle tasks. The IDA cycles required for a particular task, such as neutralizing a target system, depend on the nature of that system—the vulnerability and recuperability of subsystems, and the accuracy and effectiveness of one's own decision and action components of the IDA cycle. The probability of a single-cycle task is very low, considering that some cycle overrun would be needed for a reasonable degree of assurance of task achievement. But the objective clearly must be the reduction of the number of cycles required for a particular task, as close to unity as possible, along with compression of each cycle (time), since the total term taken would be the sum of all cycles.

One method of achieving this would be identifying the weak links in the IDA cycle, then incorporating appropriate solutions to strengthen the cycle, or in other words reducing the subcycle or cycle time. The solution selected could, depending on the problem area, be based on improving procedures or technological modifications or innovations. The rule of the chain applies here—that is, the strength of the cycle in terms of time will often be only as strong as the weakest link of the cycle (again in terms of time). Delays in one segment, therefore, may well be the deciding factor. Conversely, degradation of hostile IDA cycle, based on identifying weak or vulnerable positions of the cycle and attacking it at a faster pace than it can recuperate, could prove decisive in one's favor. For example, targeting Saddam's command and control functions led to an asymmetry where his IDA cycle was totally degraded in the early hours of the war, and he was incapable of responding in a meaningful time-frame, though other components of military power were available. Another example is planning airfield denial missions by designing their frequency to stay within an enemy's airfield rehabilitation ability in terms of time. A striking

case of time versus time is the frequency-hopping technique used by radars as an electronic counter-countermeasure in a race in the fourth dimension, against the effects of hostile electronic countermeasures.

Of the advances underway, the most significant are in the information segment of the cycle. In fact, this segment is technologically more dependent than the others, and thus the payoffs are likely to be much greater. This has been recognized by many experts, some of whom have called information a new revolution in war. While the role of information in the time dimension deserves special attention, it must be recalled that information is merely a means to an end, not an end in itself. It must be seen as part of the overall IDA cycle, although a critical component of the fourth dimension. Information warfare involves using information to one's advantage and also denying its benefits to an enemy. Under close scrutiny, therefore, information entails degrading, delaying, and disrupting information to confuse an enemy and increase response time. The greatest change in the information campaign over the years has been the expansion of the quantum of information which can be made available and the contraction of processing time (a microrevolution in itself).

The speed and volume of information, although an asset in the fourth dimension, can create vulnerabilities. Even with reduced processing time, there is a possibility of information overload, creating congestion and delays in using information. Thus there will be an inescapable need for the information to be time-sensitive. The amount of data processed will be greater than the processing power of the information system and, therefore, information technology application in combat has become more susceptible to the time factor. And since it is actually a subset of the IDA cycle, it is correct to term the advances in information technology as incremental to the criticality of the time dimension, hastening the advent of the fourth dimension as a true RMA.

M–1 Abrams.

U.S. Army

Targeting Time Cycles

Had Saddam Hussein thought in the fourth dimension, he might have realized that the only chance that Iraq had of success was the disruption of the coalition build-up during Desert Shield, which offered a window of vulnerability as the allies mobilized. The point was not whether Iraq could have defeated the coalition in battle, but recognition that the war would have followed a different course if the fourth dimension had been exploited. The coalition did control and exploit it to a certain extent, as seen in the interception of Scud missiles, which would otherwise have been extremely difficult. It is worth noting that after the war the Pentagon initiated programs such as the Joint Precision Strike Demonstration Task Force (JPSDTF) to reduce sensor-to-shooter timelines. The goals of JPSDTF include reducing timelines, now measured in hours, to two minutes.[14] This is a clear recognition of the impact of the fourth dimension in warfighting. In fact, the question of ballistic missiles being a destabilizing factor is essentially linked to the fourth dimension, as these missiles, especially short range ones, do not give the IDA cycle of the defender adequate time to mount a response even if the means exist. Tightening the cycle beyond reasonable human control was no doubt a major factor that led to the intermediate nuclear force treaty since vulnerabilities on both sides increased inversely to the tightening of the cycle dictated by the missiles. The first step in defending against the missile threat thus lies in the fourth dimension as any anti-missile defense system designer must recognize. SDI did this by developing technologies that promised to reduce the time needed for early warning and boost-phase/mid-course interception. The Soviet objections to SDI also resulted from the implicit adverse asymmetry of the relative IDA cycle.

As airpower demanded airpower to counter it, so will the new dimension of time require its war to be fought in the fourth dimension. Just as air superiority was a prerequisite to successful warfare in the third dimension, freedom of action and control of the fourth dimension will become necessary to operate on future battlefields. This will lead to the targeting of time cycles to degrade an enemy cycle, while safeguarding one's own from enemy interference. The objective of causing an asymmetry in this dimension will demand thought and action to create a time differential where the

IDA cycle for an objective on any level of war starts and finishes before the response time or enemy IDA cycle. If one completes the cycle in "T time," forcing an enemy to complete its cycle in "T-plus time," one creates a time differential. In other words, to conduct time warfare one must stay within the enemy IDA cycle, thus gaining control of the fourth dimension. Only with control of time can one exploit this dimension and subsequently fight in other dimensions. If control of time is lost it is likely to pass on to the other side, and the side which loses the race for control of the fourth dimension will find itself continuously sliding down in its time cycles. Recovery may be made difficult by a domino effect influencing current and future cycles. The side that controls time will be in a superior position to conduct war in all dimensions.

the side that controls time will be in a superior position to conduct war in all dimensions

Centuries of conflict have proven that offensive action provides the greatest control in any dimension of warfare, and time is no exception. In fact, considering the potentially destabilizing nature of time warfare, the fourth dimension favors the offensive more than any other dimension. Traditional military organizational structures may require redefinition to suit demands of war in the new dimension to pass the litmus test of a small IDA cycle. Plans must ensure that nodal points, vulnerable to enemy interference, are kept to a bare minimum. Hardening organizational structures against interference should be done using physical and software solutions to provide counterforce dividers. At the same time, the ability to create friction must exist to degrade enemy IDA cycles.[15] Integrating technologies—artificial intelligence, JTIDS, JSTARS, AWACS, et al.—is fundamental to the reorientation of military structure.

In the future a number of countries are likely to reduce their IDA cycles, enabling them to fight in the fourth dimension. It is hard to see a serious challenge to the United States on the global level for the next quarter century. Only Japan has the requisite technological strength. But intent is another matter altogether. Although Russia now lags in fourth dimension technology compared to the United States and Japan, it can be expected to catch up. At the regional level, however, the key question that U.S. forces will confront is whether they have sufficient power in place to counter a belligerent able to exploit the fourth dimension. If not, they may be threatened by the dynamics of the IDA cycle before reinforcements can be deployed. Between other states, the conflict would be shaped by the relative capabilities of sides in the fourth dimension and how these are exploited.

Of all emerging technologies, the most significant impact on the fourth dimension may be the trans-atmospheric vehicle (TAV). This technology will make it possible to rapidly launch small satellites to provide cover of an area in the event of the regular sensors being incapacitated through antisatellite warfare, which is expected to increase as reliance on the sensors grows to cut down the IDA cycle. TAV can also be employed in an antisatellite role since it will provide a highly accurate, flexible, and low-IDA cycle option with on-board directed and kinetic energy weapons. Thus the impact of the fourth dimension is likely to increase exponentially based on the capability of TAV which, flying at a speed of Mach 30, will be able to target a point on the surface of the earth from its ground station in thirty minutes. It will therefore become virtually impossible to think without operating in the dimension of time when planning and conducting war. JFQ

NOTES

[1] R. Ernest Dupuy and Trevor N. Dupuy, *The Encyclopedia of Military History* (London: McDonald, 1970), p. 137.

[2] Jasjit Singh, "Evolution of Politico-Military Doctrines," in Jasjit Singh and Vatroslav Vekaric, editors, *Non-Provocative Defence* (New Delhi: Lancer Press, 1990), pp. 17–18.

[3] David MacIsaac, "Voices from the Central Blue: The Air Power Theorists," in Peter Paret, editor, *Makers of Modern Strategy: From Machiavelli to the Nuclear Age* (Princeton: Princeton University Press, 1986), p. 627.

[4] Giulio Douhet, *The Command of the Air*, translated by Dino Ferrari (New York: Coward-McCann, 1942), pp. 11–16.

[5] Tony Mason, *Air Power: A Centennial Appraisal* (London: Brassey's, 1994).

[6] Harold Faber, *Luftwaffe: An Analysis by Former Luftwaffe Generals* (London: Sidgwick and Jackson, 1979), p. 165.

[7] J.F.C. Fuller, *The Second World War, 1939–1945: A Strategical and Tactical History* (New Delhi: The English Book Store, 1969), pp. 220–59.

[8] Jasjit Singh, *Air Power in Modern Warfare* (New Delhi: Lancer International, 1985), pp. 1–33.

[9] Some regard electronic warfare as the fourth dimension; Ibid., pp. 122–37.

[10] Simon P. Warden, *SDI and the Alternatives* (Washington: National Defense University Press, 1991), pp. 159–60.

[11] Eliezer "Cheetah" Cohen, *Israel's Best Defence*, translated by Jonathan Cordis (New York: Orion Books, 1993), p. 468.

[12] Frank Barnaby, *The Automated Battlefield* (London: Sidgwick and Jackson, 1986), p. 141.

[13] Richard E. Simpkin, *Race to the Swift: Thoughts on 21st Century Warfare* (London: Brassey's Defence Publishers, 1985), pp. 182–84.

[14] John Boatman, "Army Plans Two-Minute Warning," *Jane's Defence Weekly* (June 17, 1995), p. 27.

[15] Carl von Clausewitz, *On War*, Anatol Rapoport, editor (London: Penguin Books, 1968), pp. 164–67.

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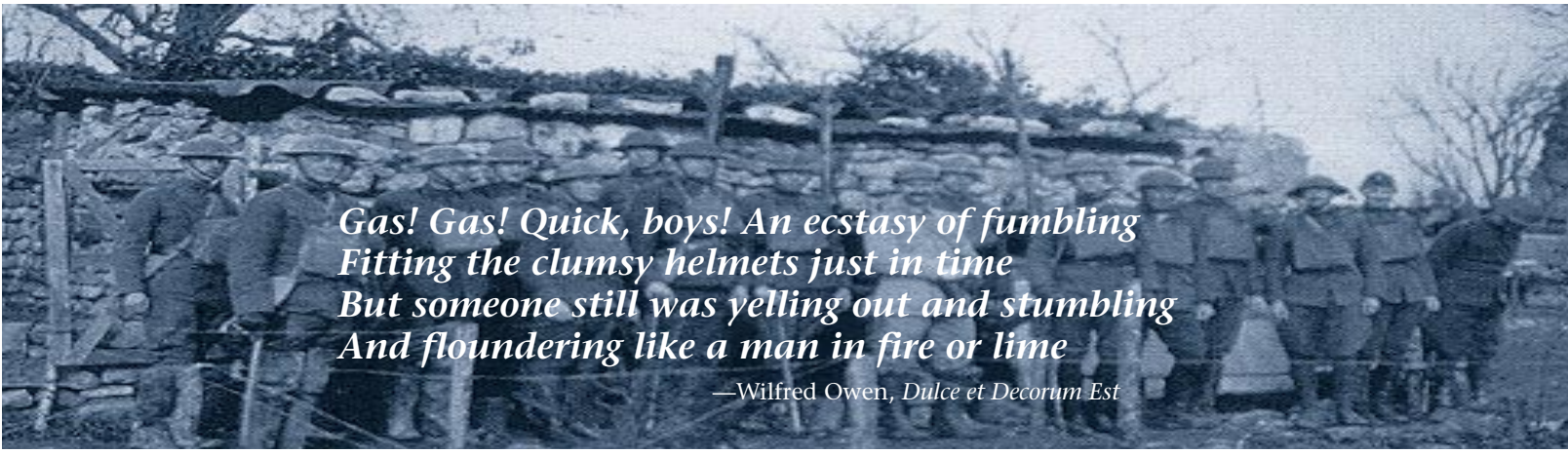

U.S. Army Military History Institute

An Ecstasy of Fumbling: Doctrine and Innovation

By KENNETH F. McKENZIE, JR.

The information explosion is beginning to influence that most conservative of institutions, the Armed Forces. Professional journals from *Parameters* to *Proceedings* are awash with articles on RMA and military technical revolution (MTR).[1] Depending on their technological or ideological bent, these articles either hail new developments as a shining path to the future or gloomily decry the shortcomings, both real and perceived, of emerging concepts and hardware. Thus it is difficult to tell if we are entering an era in which perfect knowledge—that is, information dominance—will be coupled to perfect strike capabilities or if we are about to field complex systems that will deluge users under mountains of trivial data attached to easily thwarted strike technologies. What we can be sure of is that we are on the verge of an explosion in ideas as well as systems that promises to change the way war is fought. In fact, RMA is nothing more than the military application of ideas from a global revolution in technology brought about by advanced computerization techniques.

Two Cultures

Technological innovation is unruly, spasmodic, and to a certain extent uncontrollable—the opposite of developing force structure and doctrine which tends to be highly predictable, cautious, and self-regulating. To effectively link doctrine and technology one must combine the dynamism of scientific inquiry and the caution of military culture (see figure 1). This is not a condemnation of the military mind. Soldiers are innately cautious because the stakes in their profession are high. The outcome of war is critical to national survival. Success or failure is measured in human lives.

Operational doctrine and organizations must be flexible enough to embrace new capabilities that arise from research and applications far removed from military requirements. Taking practical battlefield advantage of new ideas is the responsibility of doctrine. To do this, the military culture must be prepared to leap forward with technology and establish meaningful paradigms for practical soldiers from technological starting points that may appear unreachable at first. At the same time, the culture must be discerning enough to reject irrelevant or unnecessary capabilities. This is a tall order for cautious minds forced to deal with explosive opportunities, but the alternative is disaster. An inability to accommodate ideas or, more likely, a tendency to misapply concepts will be paid for in opportunities lost in combat.

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The interaction between emerging technologies (together with the weapons and capabilities that ensue) and doctrine—the way land, sea, and air forces fight—will be the fundamental dynamic in determining whether new ideas are digested and used properly. In short the question is whether we can translate technological concepts into battlefield advantage.[2] That is a crucial step, because technological advances, regardless of their inherent brilliance, must be harnessed to a coherent model to be employed for decisive advantage. New technologies must be integrated with tactical organization, techniques, and procedures. This is easy to understand but difficult to accomplish. It requires managed, directed interaction of scientific and industrial methods with a military culture that must deal with the realities of the battlefield. These two worlds may be far apart, but they can eventually be merged. Avoiding an "ecstasy of fumbling" over integration can provide the margin of victory over an opponent who is struggling with the same problems.

Figure 1. The Scientific and Military Worlds

Scientific Culture	Military Culture
Driven by discovery; non-hierarchical	Driven by knowledge; hierarchical
Embraces the unknown	Avoids the unknown
Externally directed	Internally directed
Long term orientation	Short term orientation
Outcomes are secondary	Outcomes are paramount

translating potential into functional purpose dictates the pace of organizational and doctrinal integration

Chicken or Egg?

Requirements may be driven from the bottom up based on combat imperatives, or from the top down based on a concept for employment. Ideally, requirements are identified, then directed technological advances provide capabilities to answer the need. This almost never happens—and in an era of exploding ideas, requirements are vastly outpaced by burgeoning technical capabilities. This means that many ideas emerge from a growing external base, offering exponential advances increasingly dislocated from a conservative internal approach to requirements. In some cases this means that the requirements system is being wrung inside out. We are examining the relevance and utility of advanced systems and technologies that we have not requested and that have not been validated by any concept-based demand, which is uncomfortable and inevitable. Increasingly, the origin of a capability will become less important. The only criterion will be its advantage in battle.

New ideas and technologies introduce potentialities, some self-generated, others externally created. Cumulatively, they shape the expectations for the new idea. What is this thing supposed to do? How can we measure its success? Some expectations, such as the Manhattan Project, are obvious, others less so. Translating potential into functional purpose, articulating an end state, can destroy a project before it reaches fruition, regardless of technical feasibility. Expectations can be set too high or low. Either extreme is counterproductive. The ability to determine a reasonable and attainable end state for new technology dictates the pace of organizational and doctrinal integration. This can be difficult, because relationships of this nature are neither linear nor static. Instead, the interactions are dynamic—expectations change as technologies mature. At the same time, existing doctrine and organizational patterns are not frozen. They, too, are responding to external stimuli.

The development of the XB–70 as a high-altitude supersonic penetrating bomber in the late 1950s is a case in point. Despite technical feasibility that was demonstrated, the improvement in Soviet air defenses forced a shift in Air Force strategic bombing doctrine, away from high altitude to a low-level approach. Doctrine changed as the technology arrived. Many other examples come to mind. Royal Navy battlecruisers during World War I were designed and built for a high-speed scouting role, yet they were eventually forced to lie in the line of battle, largely because they looked like battleships—which had disastrous results at Jutland. The process of melding technologies and doctrine is difficult because both are "moving targets."

When new technology only modifies an existing paradigm for the conduct of war, it can be readily subsumed and digested. It may also be misapplied. The disastrous fielding by the French of the *Mitrailleuse* in 1870 is an example (this early machine gun was employed as an indirect fire weapon and kept so secret that its users were unfamiliar with its capabilities). Conversely, some technologies establish entirely new paradigms—the tank, airplane, and radar, for example (though it should be remembered that the tank was initially misused as a pillbox, the airplane as a horse that flew, and radar as a pair of binoculars). The creation of revolutionary new paradigms like these is relatively rare. Most new technologies only modify existing methods, although even incremental modifications eventually may greatly change an operational paradigm.

Germany and Chemical Warfare

The German attempt to integrate the technology of gases in World War I is a telling case of the difficulties in harnessing technology to military purposes. No clear requirement generated the capabilities inherent in gas; instead

chemical assets emerged almost without regard to requirements. Gas warfare began as a technological initiative of the German chemical industry. It is the story of the translation of an experimental concept into integrated doctrinal and organizational acceptance. The final adoption was ultimately expressed in approved tactics, techniques, and procedures, all part of a coherent doctrine for employment. The cost of achieving this integration was time—time lost that could never be recovered.

German experience with offensive chemical warfare is particularly relevant today because it clearly illustrates the difficulty of integrating developing technology and existing doctrine. In many ways, it parallels the broad yet second-order technology of information management as related to the battlefield. Unlike the tank or airplane, gas was not developed as an independent weapon. It did not alter the paradigm of ground combat in World War I. Instead its effects were distributively felt and essentially supportive. By 1918 these effects were evident across all aspects of German tactical doctrine, but as an enabling force rather than a centerpiece. This makes the study of these German attempts to integrate gas useful in examining new technologies today that must be linked to doctrine and organizational architecture not only directly, but more often indirectly.

Strategic Framework

Like most wartime marriages of technology and tactics, German gas warfare was driven by military necessity. By late 1914 it was clear that the great maneuver battles on the Western Front at the beginning of World War I had not been decisive. Out of broken plans came the establishment of static positions which yielded slowly but inevitably to trench warfare. This reflected a strategic stalemate that characterized the conflict until 1918. Strategic mobility, made possible by railroads and theater logistics, enabled both sides to shift reserves to prevent local successes from becoming breakthroughs. At the same time, on the tactical level, fire dominated the battlefield. The limited offensive tactical mobility of foot-mobile infantry, horse-drawn artillery, and primitive battlefield logistics systems could not overcome the defensive supremacy of fire. It was virtually impossible to generate opportunities for operational maneuver beyond the depth of enemy trenches before the latter could redeploy sufficient forces to reestablish his defenses.

The Germans endeavored to break this static front on both the strategic and tactical levels. The strategic recourse included the ill-fated 1916 Verdun offensive, an attempt to bleed the French army to death that inexorably bled both armies white. After this, the correlation of forces drove the Germans to the strategic defensive. Thus, they developed a doctrine of elastic defense in depth, designed to minimize Allied artillery superiority. In 1917 victory over the Russians allowed them once again to shift their forces westward where they could attempt to achieve a decision before the weight of American arms could be brought to bear.

Ypres

In the winter of 1914 the Germans experimented with gas in two small-scale attacks, but it did not affect enemy troops. In October 1914, at Neuve Chapelle in France, tear gas (dianiside chlorosulphate) was delivered by primitive artillery projectiles.[3] In January 1915, at Bomilov in Russia, artillery-delivered xylil bromide was used, but an attack designed to take advantage of the presumed effect of gas was a costly failure. Extreme cold weather dissipated the effects of the gas. Problems were encountered in matching gas projectiles with high explosive shells.[4] Despite these setbacks German scientists and soldiers remained interested in gas. Certainly the Allied newspaper articles claiming new and ominous French gases were a spur to German chemical enthusiasts.

Fritz Haber of the Kaiser Wilhelm Institute for Physical Chemistry in Berlin observed these failures and offered an alternative gas and delivery means. He proposed using chlorine, a lethally toxic gas to be delivered by cloud. Large quantities of commercial chlorine were readily available. Gas cylinders would be transported to the trenches and opened. Favorable winds would move the cloud over no man's land to Allied trenches. With enough cylinders, a lethal concentration could be achieved. Because the gas dispersed rapidly, an exploiting infantry attack would not be slowed. Expectations were relatively low. Scientists saw gas as simply a casualty producer. Concurrently, it might reduce the demand for high explosive projectiles. For German war planners, a shortage of helium

French 340mm (13.9 inch) gun.

(HE) was a real possibility. No operational requirement had been set forth for gas.

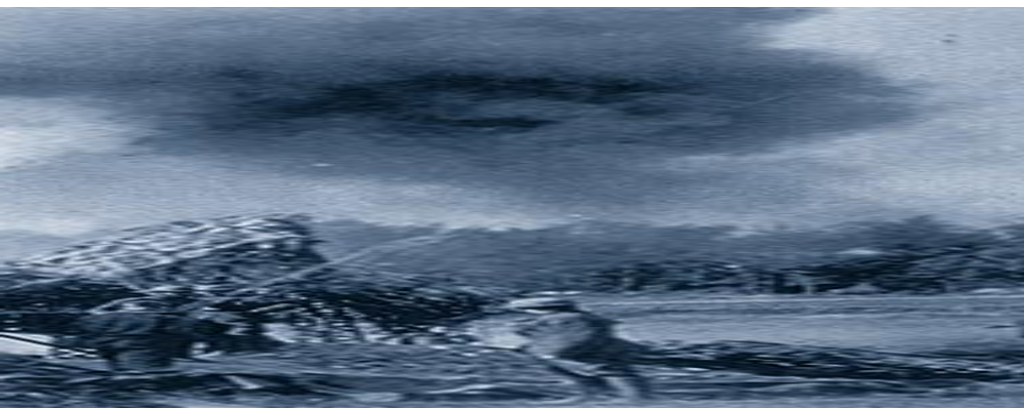
General Erich von Falkenhayn, chief of staff and de facto supreme commander, took Haber up on his offer. He decided to employ gas on the Western Front as part of a limited attack at Ypres that did not heighten expectations for using gas. Ypres would test gas as an offensive weapon and cover redeployment to the eastern theater, where the main effort for 1915 was planned. The failure of earlier chemical experiments was duly noted. There was no attempt to consider exactly how gas might change the tactical balance of power.

Duke Albrecht's Fourth Army had emplaced over 5,700 large and small chlorine cylinders. Two infantry corps were prepared to follow the cloud this would generate, overrunning the Allied positions. But a complication arose. The prevailing winds were from west to east, which was bad both in the long and short term for German gas cloud operations. The Fourth Army waited over a month before the weather was adequate. To planners, the Western Front had become a supporting action. Falkenhayn's attention had swung east to Galicia. Thus, on April 10, 1915, Falkenhayn made it clear to General Ilse, chief of staff of Fourth Army, that it was "more important to launch the gas cloud as soon as possible than it was to obtain a deep penetration." As if to emphasize his point, Falkenhayn refused the Fourth Army request for an additional division to exploit possible success and also turned down requisitions for supplementary artillery ammunition.[5]

Once started, late in the afternoon of April 22, 1915, things went better than even the most sanguine gas enthusiast could have hoped. The brunt of the attack was borne by Algerian troops who broke and ran. A gap of some four miles appeared in Allied lines. Thirty minutes after the gas discharge, German troops advanced four and a half miles until encountering a rag-tag cordon of Canadians. The assaulting infantry, tired and perhaps having lost their edge in the month-long wait for proper winds, could not break the line. There were no German reserves to throw in, so the momentary gap disappeared.

gas seemed to slow the advance of the attackers almost as much as the fire of the defenders

Subsequent gas attacks over the next 48 hours were unfruitful, although they caused over 5,900 Allied casualties, a ratio of over two Allied soldiers to each German.[6] In the context of most engagements, this was a heartening statistic for the Germans.



U.S. Army Military History Institute

Interestingly, the gas seemed to slow the advance and depress the ardor of the attackers, who feared its unknown effects almost as much as the fire of the defenders.[7] There were positive technical and tactical aspects of Ypres. The ratio of casualties was favorable, and a gap opened in the French lines. Unfortunately, there was no plan for taking advantage of the penetration, and while one can criticize the Germans for wasting an opportunity in an insignificant localized operation, this is hindsight. All the Germans expected of gas was that it would produce casualties. Gas had been effective against unprepared forces, but such surprise could be achieved only once. The success of Ypres was not exploited, so thus it was irrelevant and meaningless. The shock effect of the new technology was not matched by tactics for a fleeting opportunity. Even if the Fourth Army had been better prepared to continue the attack, given the limitations of artillery mobility and logistics, it is difficult to believe that it could have been translated into an operational success.

Chemical warfare was primitive and unable to produce the ideal gas for maneuver support, one of high toxicity but not persistent. Such developments (nerve agents) rested in the future. The gas used by the Germans, particularly when limited to cloud attacks, could produce casualties but were too blunt to shape the battlefield decisively. Their net effect was simply to add more friction to a situation that was already frightful enough. Gas was a two-edged sword that worked against attackers as well as defenders, and it was not lethal enough to be used as an independent bludgeon. Without maneuver, it could not produce enough attrition to alter the balance of power. The basic problem, which would haunt the Germans for three years, was the relation of gas to maneuver.

Failure to Integrate

Over the next two years, the Germans used various gases and delivery systems against the Russians and Italians and on the Western Front. Results were generally favorable but not decisive. One problem with gas attacks was the lack of reliable means for assessing results which plagued the Germans throughout the war. Professor Haber was placed in charge of the German chemical warfare effort. Eventually, he served as the link among science, industry, and the high command. It was not


Meuse-Argonne, 1918.

an altogether successful linkage. The military distrusted scientists to some degree, but a reasonable amount of cooperation was achieved by Haber. The Germans consciously decided to make their effort self-contained "on account of the special nature of the work, the need for secrecy, and the desirability of avoiding any delay with a weapon that was developing so rapidly."[8] The industrial production of gases and delivery systems was generally adequate. Over time, the problem became less one of scientific research and industrial manufacture than tactical application. The gases could be produced; but what were they supposed to do?

The introduction of phosgene, a more potent agent, was accompanied by improved artillery and projectiles as the principle delivery technique for German chemical weapons. Artillery added depth to gas, making it less reliant upon weather. Diphosgene (green cross) gave German gunners a potent, in-depth offensive chemical capability. By mid-1915 German offensive chemical thought began to embrace a concept which has become basic to chemical warfare: the division of offensive chemical weapons into persistent and nonpersistent agents. The recognition of this duality started the interpretation of chemical warfare technology and conventional artillery tactics. With this came a heightened set of expectations for chemical weapons. They could perhaps do more than create deadly friction and fear in friend and foe alike. This blunt, deadly weapon could be sharpened.

With this technical interpenetration, artillerymen began to apportion chemical targets in two categories. Targets attacked by infantry received nonpersistent agents, and those attacked by fire only, suppressed, or denied, received persistent agents. This split was, and remains today, a pillar of offensive chemical warfare doctrine.[9] For the Germans it began—but only began—to provide the structure for a coherent application of chemical weapons. Despite these technical advances, it was clear that offensive chemical warfare alone would not break the tactical stalemate in the West. The opportunity proffered at Ypres, combining German surprise and Allied unpreparedness, defied replication. In fact, if the machine gun was the essence of infantry, then gas remained the essence of attrition. It simply added to the coefficient of friction on a battlefield already overwhelmed with obstacles to maneuver and casualty-producing systems. Because it proved difficult to link gas to maneuver, by late 1915 chemical operations had become dislocated from offensive maneuver.

The goal of German chemical attacks had nothing to do with attempts at a breakthrough. Instead they sought simple attrition. The nadir of this offensive chemical employment was typified at Verdun in 1916 where massive amounts of diphosgene were fired on French artillery positions in barrage operations which were not linked to ground maneuver to take advantage of success.[10] Despite the development of a technical architecture for targeting, a broad doctrine and a vision for operational integration were lacking. From 1915 to autumn 1917, the German chemical warfare effort, regardless of how relatively advanced it was, would be without a framework for employment. This diffusion of purpose prevented gas from being used in an integrated combined arms effort.

Figure 2. German Chemical Warfare Development, 1914–18

Time	Illustrative Battles	Expectations	Effects	Doctrine
1914–15	Bomilov, Nueve Chapel, Ypres	none	mixed	none
1915–17	Verdun	low	indecisive, attritive	technical only, not linked to maneuver
1917	Riga, Caporetto	moderate	successful, attritive	informal technical and operational; linked to maneuver
1918	Michael	high	very successful	formal technical and operational; linked to maneuver

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Changing Expectations

A doctrinal development reflecting organizational and tactical changes brought gas to the fore as a tool to break the tactical deadlock: the introduction of infiltration tactics. These tactics put a premium on short, high-intensity hurricane artillery barrages that gas projectiles could enhance. In October 1917, artillery-delivered chlorine and phosgene were fired against Italian positions on the Isonzo River at Caporetto, coupled with an attack led by infantry trained in infiltration tactics. The Italians were unprepared for both the gas and *Stosstrupen* and were routed.[11] It was one of the most complete successes for gas in the war and served as a model for subsequent attacks in the West. This action, coupled with similar success at Riga in September 1917, were harbingers of an increasing role for gas in German offensive thinking.[12] Another was the German counterattack at Cambrai. In November 1917 a short artillery preparation preceded the infantry infiltration-style attack. A large percentage of the shells were chemical, which disoriented the British defenders as much as caused injury. The use of gas in such cases was aimed at suppression, not destruction, and greatly reduced the time required for the German artillery to achieve effect on target.

The Germans developed a vision for effective, coherent offensive chemical doctrine in early 1918, when informal procedures of the previous two years were superseded by a comprehensive work released by the high command on January 1, 1918 entitled *The Attack in Position Warfare*. This document set out the German approach to breaking the tactical stalemate of trench warfare. It reflected the lessons of Riga, Caporetto, and Cambrai. Gas was a key element, both because of its "disruptive characteristics" and because it gave artillery greater effectiveness over shorter times.[13] For rapid suppression, gas was far more economical. Excellent suppression, particularly against enemy artillery, could be obtained with far fewer gas than conventional HE shells.

the technological advantage afforded by industry was not matched in doctrine or organizational concepts

In infiltration tactics, speed of attack was critical, and artillery-delivered gas heightened the shock and force of indirect fire without requiring the long preparatory fires typical of both British and French tactics at this period. Toward that end, by the close of the war the basic load of German artillery units was 50 percent gas shells.[14] In certain operations the ratio of gas to conventional rounds fired was three to one. Driven by a slowly awakening doctrine, technological advances were being integrated into organizational practice and tactics. The expectations were shifting, with chemical warfare techniques being integrated into a larger tactical calculus.

An important development was technological, the widespread adoption of mustard gas, or yellow cross. Mustard was lethally toxic and persistent; it could kill up to 72 hours after exposure and acted against skin as well as lungs. In the German Michael offensive of 1918, mustard agent was fired as a barrier to deny the flanks of attacking formations and against targets that were not to be assaulted by infantry. Nonpersistent agents such as chlorine and diphosgene were fired against targets to be carried by the German infantry. It was a sophisticated approach: lachrymatory gases, or throat irritants, were mixed with other gases to force defending infantry to remove their masks, thus rendering them vulnerable to lethal agents. As the 1918 offensives ground themselves out and reached an end, the Germans discovered the utility of mustard agent as a defensive weapon. It proved a highly effective barrier weapon and ultimately was more successful in the defense than in the attack. Had the war remained mobile, mustard agent—available to both sides by 1918—might have served to slow the tempo of the fight yet again by denying vast areas to maneuver forces.[15]

The Lessons

The hinge of history turned at Ypres, but the Germans were unprepared. The technological advantage afforded by industry was not matched in doctrine or organizational concepts. Ironically, initial German conservatism toward gas was sparked by earlier small-scale failures.[16] It would not be until late 1917 that offensive chemical warfare again played a significant combat role. For the Germans, systematic success with offensive chemical warfare finally occurred when it was used in a totally integrated operational concept, when the strengths of gas warfare—suddenness, shock, and variable persistencies—were linked to a broad, thorough tactical scheme: infiltration tactics. This interpenetration of technology and doctrine yielded a coherent framework for employment. Gas was the junior partner in 1918, one of the key supporting tools for infiltration tactics; a means, not an end. In this case, the shifting paradigm of infantry and artillery combat for the Germans absorbed the capabilities provided by gas and gave them useful

expression. Before the linkage of gas to infiltration tactics, chemical warfare was a clumsy, balky killer; after the linkage it became a lethal accomplice.

As shown in the accompanying figure, German offensive chemical warfare ultimately helped to break the tactical deadlock on the Western Front, but the long gap between first use in 1915 and coherent employment in 1918 blunted its contributions. Despite the best of intentions, the Germans were unable to rise above the lure of simple, direct attrition and to effectively link chemical warfare to maneuver until 1918. By then it was too late.

The German experience offers important lessons. The inability to fully exploit offensive chemical capabilities was linked to the dynamic nature of war. New weapons may have enormous shock value but also operate under a principle of rapidly diminishing returns. We must plan for their initial use with maximum effect. If capabilities are either misunderstood or unappreciated, they will be misused—or, as with gas, underused. The chance for decisive action can disappear because the opposition will compensate, often at a fraction of the original cost.

Weapons and technologies which are becoming available today, particularly those related to information management, represent only part of a larger global revolution in technology. On the operational level, we must exploit fleeting advantages that even immature, incomplete technologies offer. This involves recognizing that new ideas may well bring new vulnerabilities. Time is a key consideration in using new technology, for action deferred may be success denied. At the same time, the casual, unconsidered use of immature technology, while locally successful, may prevent a subsequent coordinated application of its ultimate strategic significance. But there is no formula for success. Each opportunity must be weighed against the potential cost. Our goal must be to reduce the period of fumbling, the time in which we try to mesh capabilities with a coherent plan for employment. Success will largely be a function of how quickly we mesh them operationally.

As we enter the next century, the Armed Forces must accommodate significant changes in alliance structures and political direction, and soldiers, sailors, marines, and airmen must consider how best to cope with new weapons and technologies. Not every decision about these weapons and technologies—and, importantly, how we think about them—will have an immediate tactical effect, but as the Germans learned in World War I, an "ecstasy of fumbling" about how to integrate a new idea can cost dearly in both the short and long runs. Thus we should think critically about how ideas have been integrated into military organizations in the past and should not hesitate to apply the lessons to current situations. JFQ

NOTES

[1] Andrew F. Krepinevich, in "Cavalry to Computer: The Pattern of Military Revolutions," *The National Interest*, no. 37 (Fall 1994), p. 30, defines MTR as "what occurs when the application of new technologies into a significant number of military systems combines with innovative operational concepts and organizational adaptation in a way that fundamentally alters the character and conduct of conflict."

[2] Michael T. Mazarr et al., *The Military Technical Revolution: A Structural Framework* (Washington: Center for Strategic and International Studies, 1993), p. 18.

[3] Charles E. Heller, *Chemical Warfare in World War I: The American Experience, 1917–1918* (Fort Leavenworth, Kans.: Combat Studies Institute, 1984), p. 6.

[4] Guy Hartcup, *The War of Invention: Scientific Development, 1914–1918* (London: Brassey's, 1988), pp. 95–96.

[5] J.L. McWilliams and R.J. Steel, *Gas! The Battle for Ypres, 1915* (St. Catherines, Ont.: Vanwell Publishing Co., 1985), p. 26. See also Basil Liddell Hart, *A History of the World War, 1914–1918* (Boston: Little, Brown and Co., 1935), p. 248.

[6] Heller, *Chemical Warfare*, p. 31.

[7] Liddell Hart, *History*, p. 248.

[8] Hartcup, *War of Invention*, p. 105.

[9] Edward M. Spiers, *Chemical Warfare* (Urbana: University of Illinois Press, 1986), p. 23; Edward M. Spiers, *Chemical Weaponry* (New York: St. Martin's Press, 1989), pp. 26–27.

[10] Ibid.; Bruce I. Gudmundsson, *Stormtroop Tactics: Innovation in the German Army* (New York: Praeger, 1989), pp. 67–68.

[11] Patrick T. Stackpole, "German Tactics in the Michael Offensive, March 1918" (MA thesis, School of Advanced Military Studies, Fort Leavenworth, Kans., 1993), pp. 35–41.

[12] Ibid., pp. 28–34.

[13] T.T. Lupfer, *The Dynamics of Doctrine: The Changes in German Tactical Doctrine during the First World War* (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College, 1981), p. 41.

[14] Stackpole, *German Tactics*, pp. 49–53.

[15] Stockholm International Peace Research Institute, *The Problem of Chemical and Biological Warfare: Vol. 1, The Rise of CB Weapons* (Stockholm: SIPRI, 1971), p. 140; Heller, *Chemical Warfare*, pp. 24, 27.

[16] McWilliams and Steel, *Gas*, p. 214.

Leaving the Technocratic TUNNEL

By GARY W. ANDERSON *and* TERRY C. PIERCE

There is an emerging consensus that the success of exotic weapons in the Persian Gulf War and promise of high-tech gadgetry marked the beginning of a military revolution. It is believed that such stunning technology has ushered in a new era of warfare by combining long-range precision strike with powerful overhead sensors and high-tech equipment. Unfortunately, being mesmerized by technology may result in a narrow view of RMA. Admittedly something profound and perhaps catastrophic is occurring. Sweeping changes are underway that could totally transform war. But the common view of RMA—the system of systems that gathers near-perfect information to locate and destroy every target in an oddly specific area of two hundred square miles—does not capture the far-reaching implications of a revolution.[1]

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Revolutions

A profound change that sweeps aside old ways and imposes new ones generally qualifies as a revolution. Most military revolutions have been enabled by technologies such as the longbow, gunpowder, and internal combustion engine. But these innovations did not constitute a revolution in themselves. Real revolutions such as *Blitzkrieg* and amphibious warfare came from outside the military. Only later did the doctrine and organizations needed to integrate the technology develop.[2] Ultimately, however, a revolution is too powerful and widespread for a military institution to direct or influence profoundly. The military does not drive a revolution; a revolution drives the military.

Why do the proponents of a system of systems which is made possible by the information revolution vaunt it as a genuine RMA? A glance into the recent past sheds light on this standpoint. During the Cold War, the Nation preserved a commanding technical lead in crucial military systems such as ballistic nuclear missiles and precision-guided weapons. These systems largely depended on technologies that were essentially military-exclusive. Thus, it was easy to gain a technological monopoly on such military systems

because the government had the economic means and political will to pursue and sustain R&D. This Cold War perspective has been carried into the information age. As a result, RMA adherents envision that we will experience an easy revolution brought on solely by a similar kind of technical supremacy which will translate into a profound military edge. But this brief era of military-exclusive technology is quickly ending. The dominant technological development now is the so-called information revolution, and it has arisen outside the military.

It is important to distinguish here between *information warfare* and *information revolution*. The former represents "The struggle between two or more opponents for control of the information battlespace."[3] The latter is much broader and consists of the technical and economic upheaval caused by disproportionate growth in processing power and accessibility to individuals and small groups. Again, we must realize that the information revolution is occurring outside the military. As a result potential adversaries have excellent, if not equal, access to emerging information technology, and they will likely use it in clever ways to gain military leverage against U.S. systems and doctrine.

RMA adherents tend to think in terms of wonder weapons with magical properties

While the information revolution has only begun to affect the military, we cannot escape it. It will drag us into the future whether we want to go or not. We must thus find a way to adapt. Because the information revolution is essentially technical, discussion of this vision of RMA has tended to take us on a technocratic trip through the narrow tunnels of academe with only occasional intimations that larger truths lie outside. This is reminiscent of an earlier revolution in medicine in which a benign transformation occurred more or less automatically by the discovery of a wonder-drug. In 1933 sulfanilamide (an antibiotic) cured a German child who was dying of a bloodstream staphylococcal infection and began a period of profound change in medicine. The revolution was so great that within a lifetime whole classes of infections ebbed from the industrialized world.

Like their medical counterparts, RMA adherents tend to think in terms of wonder weapons with magical properties.[4] However, even the greatest cure is not a cure-all. At first, people were euphoric about the potential of sulfanilamide. But before long the unprecedented success of such drugs brought new problems that we were previously spared, such as cancer and other ailments of a longer-lived population.

A similar euphoria surrounds the information revolution. Some propose that information technology will lift the fog of war, give liberal democracies a permanent military advantage over tyrannies, and provide a foolproof conventional counter to nuclear weapons, thus rendering them irrelevant.[5] We are urged not to consider whether this vision is plausible, much less feasible, but rather to let our imaginations leap to ideal battle outcomes such as precision strike, dominating maneuver, and information dominance. Proponents argue that these outcomes will emerge more or less automatically from a properly designed system of systems, producing a military revolution.

As generally conceived, system of systems RMA is essentially a revolution in firepower. We therefore fall into the old trap of seeking technological solutions to warfighting problems just as the French did with the Maginot Line.[6] Our thinking is still in an initial utopian phase with the sort of visionary optimism that accompanied the early part of the Industrial Revolution.

***USS Mount Whitney* off Haiti.**

U.S. Navy (John Sokolowski)

Consequently, we are not seeing possible problems information could spur.

In the last century many informed people believed mechanization would overcome poverty and social ills, enabling civilized countries to sweep away barbarism and usher in permanent peace. It was hard for them to imagine that industrial technology would not completely abolish intractable problems, much less that it would cause entirely new ones of undreamt magnitude.

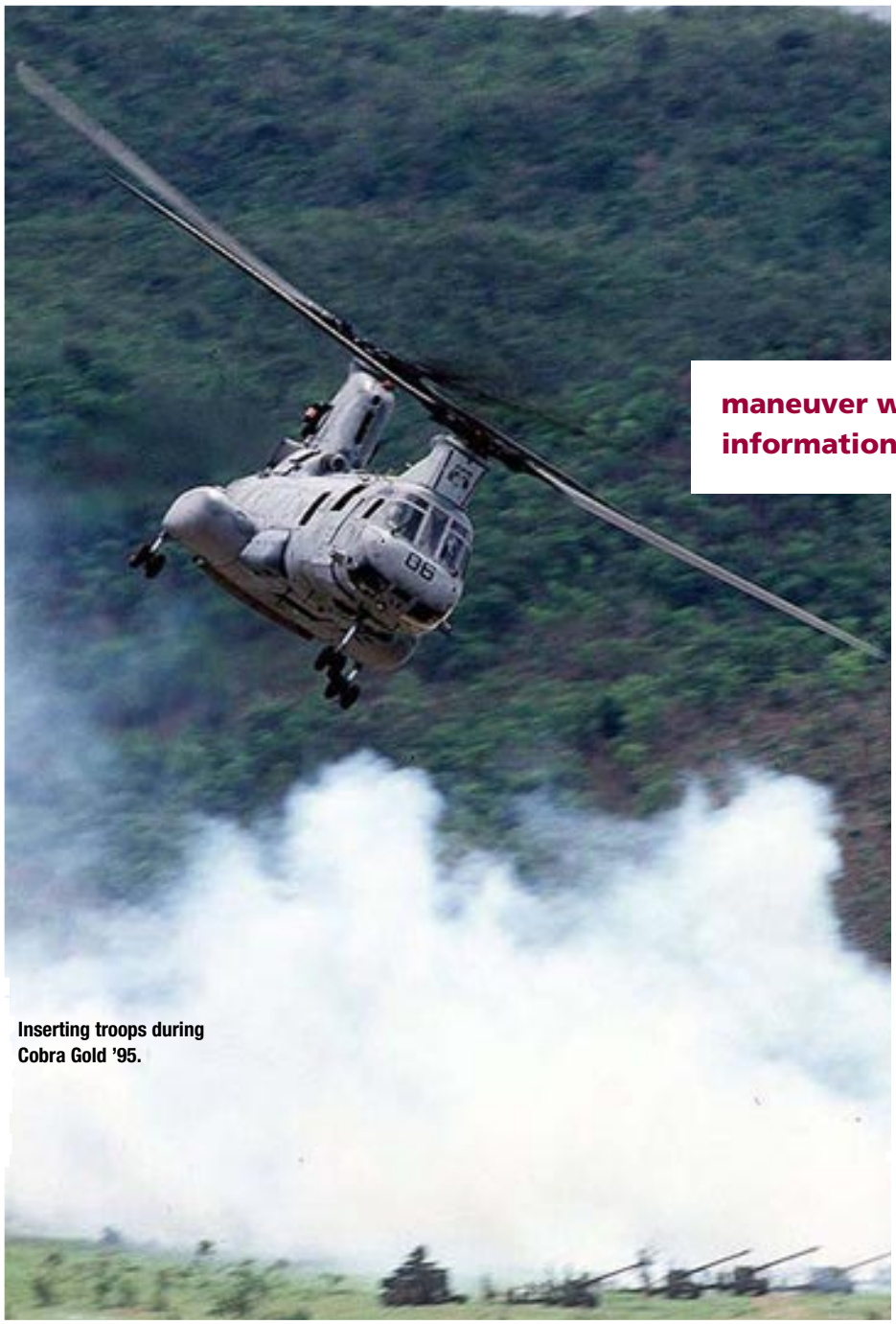
Military Implications

Armies and navies adapted to the Industrial Revolution by mimicking organizations that had proven successful in industrial mass production: a hierarchy designed to support highly centralized decisionmaking and close oversight. Their objective was to synchronize movement and maximize firepower, just as an industrial plant synchronized production to maximize output. Most militaries are still organized in this way and, not surprisingly, they experience difficulty in adapting to chaos and the complexity of the information age. Indeed, the exponential growth in information tends to overwhelm them, a phenomenon that Martin Van Creveld calls "information pathology." [7]

This is an important concept because it emphasizes the difference between the industrial and information age, namely, how to deal with uncertainty. The industrial model can be described as a centralized *detail-control* mindset that is derived from a desire for certainty, order, and precision. The information model can be characterized as a decentralized *mission-control* mindset that stems from an acceptance of uncertainty, disorder, and friction as inherent aspects of war. Supporters of detail-control—that is, system of systems RMA adherents—believe that the information revolution will eventually lift the fog of war, giving commanders an omniscient view of battlespace. This is a pipe dream because war is inherently chaotic and, as a complex information network with many interconnections and feedback loops, it has an intrinsic chaos that will hobble centralized power structures. As military information architectures become more complex, they must follow the lead of Internet which empowers distributed nodes and also demands independent action. A centralized structure simply cannot direct events in such an environment or even hope to keep track of them. In other words, just as computers have flattened corporate organizational structure, the military will likewise have to restructure and flatten out its hierarchy and rely more on decentralized control.

maneuver warfare recognizes that complex information systems—like war—are chaotic

A good example of advances in information technology forcing decentralization of controls in the civilian sector is the new "free flight" concept



Inserting troops during Cobra Gold '95.

Joint Combat Camera Center (Steve Thurow)

Harrier flying over landing craft.

Unloading Marine main battle tank.

Military Photography (Greg Stewart)

U.S. Navy (Jeff Elliot)

of the Federal Aviation Administration (FAA). With growing demands to save time and fuel, FAA wants to scrap detailed positive control in favor of changing air traffic control to management. With new information tools, free flight would give pilots the freedom to fly when, where, and how they choose, with both pilots and controllers sharing responsibility for safe aircraft separation. In effect, the information revolution is about to cause the broadest change to the U.S. air traffic control system since radar.[8]

For warfighters, adapting to the information revolution will require equally radical change. Fortunately, there is a doctrinal and organizational framework being developed on the battlefields of the 20th century that promises to be the most effective solution for the next century. It is the doctrine of maneuver warfare, which recognizes that complex information systems—like war—are chaotic. Maneuver warfare is designed to operate in and exploit that chaos.

We are only a few decades into the information revolution, roughly where the industrial revolution stood in 1840. What can we perceive at this point, and what can we do about it? First, we can appreciate the magnitude of the problem and eschew utopian solutions that give us a false sense of mastery and discourage real thinking. Second, we can look dispassionately at dominant trends. We should note that although technology has long tended to encourage more decentralized decisionmaking, there seems to be a trend in the military for more centralization. Finally, we can encourage innovative intellectual and organizational tendencies that appear most likely to accord with those trends, for example decentralized decisionmaking and a maneuver warfare approach in military leadership.

Maneuver Warfare

How ready is the military to wield the new information technology that lies at the heart of RMA? With few exceptions, the Armed Forces are essentially industrial-type organizations that stress process and control and, as a result, use centralized planning and direction. Unfortunately, it is "increased operational complexity, compressed factors of time and space, and rapidly changing situations of a nonlinear, fluid battlefield" that make a centralized, industrially-organized military incapable of meeting the stress and chaos of modern combat.[9]

Yet the standard interpretation of RMA tends to ignore the organizational implications of information technology and seeks to directly integrate existing military organizations still attuned to the industrial model. The danger lies in implementing a system of systems using an inadequate organizational concept that cannot operate in an era of information dominance. In many ways this is what the Soviets adopted as battlefield doctrine: maneuver warfare organized under a highly centralized detail-control style. This systematic, linear, and quantifiable mindset is incompatible with the frictional, chaotic, and fluid battlefield. So the real question is what the military must do to adapt to the new information technology. The answer is simple: take the system of systems and adapt it from an organizational paradigm of centralization to one of decentralization.

The Navy-Marine Corps team is well positioned to take advantage of this paradigm shift. Neither service is tied to the industrial era concept of

mass and both have traditionally emphasized placing mass at a small and decisive point. Moreover, naval forces understand war as inherently chaotic and recognize the potential of maneuver warfare, a framework of doctrine and organization developed by the Germans in response to the stalemate of trench warfare.[10]

Like war, complex information systems are also inherently chaotic. Thus, we must take a much broader view of the implications of the information revolution and revamp organizational and doctrinal structures. Effective adaptation to the principles of maneuver warfare means divorcing fighting organizations from the mechanistic, centralized control of the industrial model, which has always been better attuned to the rigid order of the old assembly line than to the chaos of battle. We must seek instead a decentralized type of organization compatible with both the battlefield and the information revolution—less focused on the highly efficient production of firepower and more on the will of an enemy to resist. This is the spirit embodied in littoral componency.

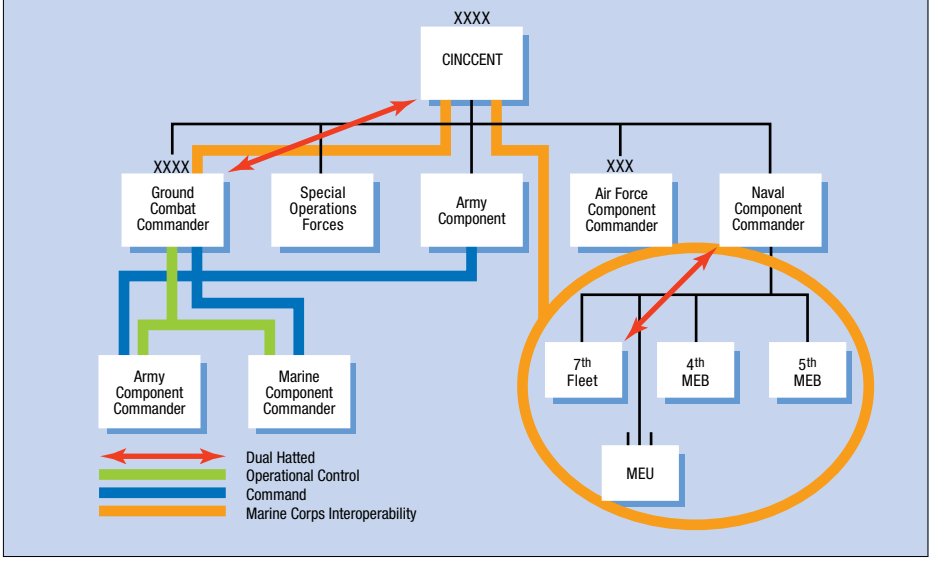
Potential for Change

The concept of littoral componency captures this potential for real change. Not only is it designed to harness the military potential of information technologies—system of systems wonder tools—but more importantly, it is a change in doctrine and organization that is needed to adapt to the information revolution.

It has been over three years since the Navy and the Marine Corps drafted . . . *From the Sea* indicating their intent to adopt a mutual littoral approach as an overall contribution to joint warfare. That vision was updated in *Forward . . . From the Sea*. Now it is the time to translate that strategy into an operational concept, littoral componency, and into a tactical concept, *Sea Dragon*.

The Navy-Marine team can present a challenge to a warfighting CINC as seen in Operation Desert Storm. The commander in chief, U.S. Central Command (CINCCENT), had to contend with one Marine expeditionary force (MEF) assigned to the ground component and four Marine air-ground task forces (MAGTFs) of two expeditionary brigades (MEBs) and two expeditionary units (MEUs) assigned to his naval component. While the sailors and marines of Desert Storm performed magnificently, their command relationships can be most charitably described as confusing. Had the marines ashore linked up with those afloat their only common superior would have been CINCCENT (see figure). Current command relationships in Korea are more convoluted. If amphibious operations were attempted, the result would more likely be a similar exercise in confusion. Simply put, CINCs in an ideal world should not have to referee naval matters, but the reality is that they must. There is a better way.

Chain of Command during Operation Desert Storm



The concept of littoral componency is simple. All naval forces required to project power ashore and support shore-based naval forces operating along a littoral should come under a single commander who answers directly to a CINC. This provides a single point of contact as well as a powerful tool for exploiting naval power-projection forces in a relatively seamless manner.

A littoral component is truly a functional component. Land, sea, and air componency can more accurately be described as elemental componency. Naval forces operating ashore, including in sustained operations, are best employed along the coast. This was the case before *Forward . . . From the Sea* codified the focus on littoral operations. When a Marine commander wants to make a helicopter landing, he should not have to go up the chain to a CINC to "borrow" helicopters from another MAGTF or rely on an ad-hoc arrangement between the naval component commander and ground component commander (GCC). From a CINC's perspective, one call should get it all.

the biggest adjustment in littoral operations may be among the naval services themselves

To make this concept operational, we must discard some old thought patterns. An MEF, oriented along a littoral, is most effective—even in sustained operations ashore—when it can work in seamless conjunction with sea-

based aviation, logistics, and naval surface fire support (NSFS). The current wisdom is that an MEF ashore in sustained operations should be a GCC asset. Littoral componency argues that Navy-Marine contributions should be power projection forces with their own zones which include land-based marines and the sea space required to support them in areas of responsibility belonging to CINCs or JTF commanders. In some cases, either the ground or air component commander (ACC) will be a CINC's main effort; in others, including most short-term military operations other than war, it would be the littoral component commander.

The littoral component commander battlespace is truly three-dimensional. The attitude that everything that flies must be controlled by a CINC-level joint forces air component commander (JFACC) will simply not give the flexibility needed in littoral operations.

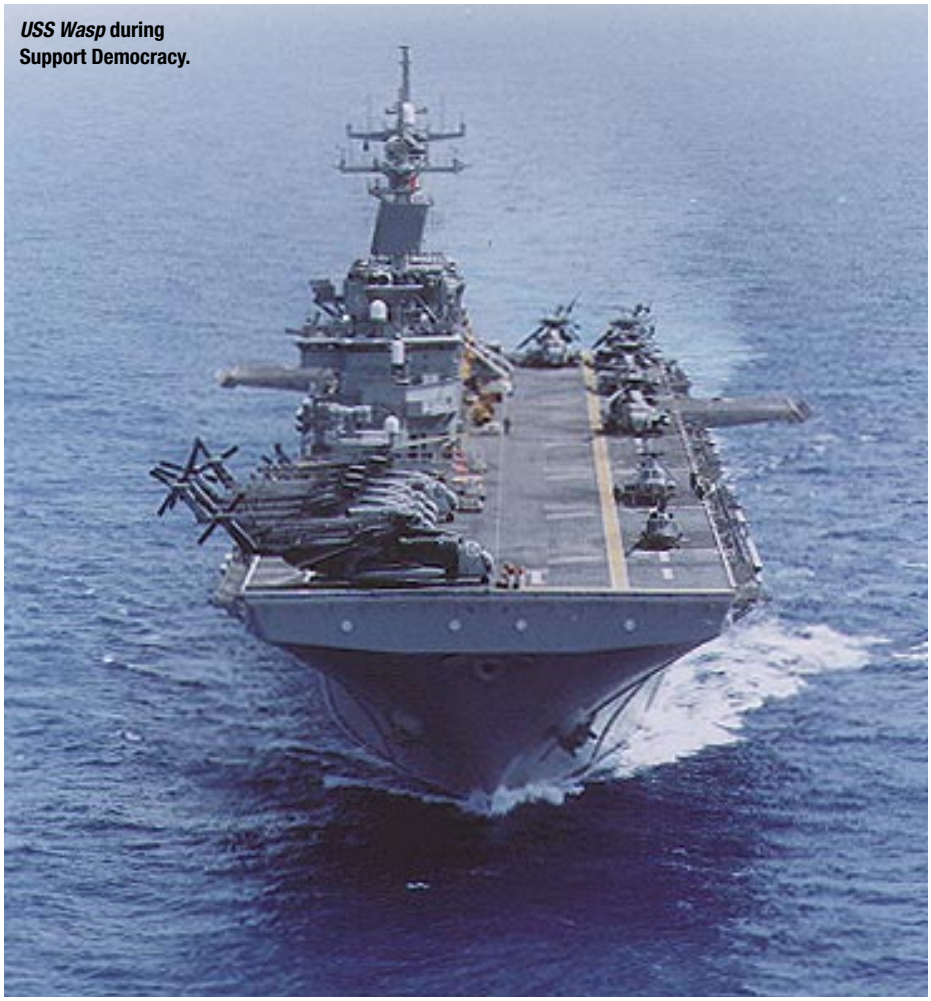
Ironically, the biggest adjustment in conducting littoral operations may be among the naval services themselves. For this concept to succeed, the littoral component staff must be an integrated Navy-Marine effort with officers of both services rotating command. If a marine commands, then a Navy officer should be chief of staff and vice versa. Some Navy officers are still uncomfortable with a marine directing movement of a naval task force, but they need to realize that the precedent was established in both Operations Sea Angel and Restore Hope, where a Marine JTF commander functioned as a littoral commander in all but name. The Marines, on the other hand, must adjust their thinking beyond the sanctity of the amphibious objective area (AOA) and inviolability of the airspace control therein. Both the amphibious objective area and amphibious command relationships were a compromise. These constructs were the best agreement possible in fighting through service rivalries in the past, but they may not be in the future.

The key to grasping littoral componency will be to change the view of littoral operations. In the past amphibious operations were seen as a horizontal penetration of a coast. Once an assault force seized a lodgment, heavy Army mechanized forces would come in to relieve them and a GCC would be established to continue the land operation. But how often will there really be a sustained land operation? That is the key challenge to the conventional wisdom. Military analysis since the Cold War has indicated that such campaigns will comprise only about 7 percent of future warfare, and even that estimate may be high.

The logistics needed to support a mechanized force such as that required for Desert Storm could be vulnerable to nuclear, biological, and chemical weapons of mass destruction (WMD). In military operations other than war (MOOTW) the threat might be insurgency or ethnic nationalism. By August 1993, the coalition force logistics lodgment in Somalia had become a virtual hostage of General Aideed's gunmen. Accordingly, much of the effort was directed at protecting this lifeline rather than accomplishing the mission.

Visionaries foresee a time when the Navy-Marine team bases most of the littoral component commander's fire support assets—such as the Navy's arsenal ship concept—as well as logistics at sea, allowing the littoral component to maneuver seamlessly up and down the coast to accomplish military objectives without a large footprint ashore.[11] Naval fire support and aviation assets also can be seamlessly transferred ashore when necessary. In most situations, a ground component in the conventional sense might not be needed at all.

Therefore we may need to start picturing joint operations vertically rather than horizontally. In this paradigm Navy and Marine forces move up



***USS Wasp* during Support Democracy.**

U.S. Navy (John Sokolowski)

and down the coast with no permanently fixed lodgment that an enemy could target. If a fixed lodgment is needed for heavy Army and Air Force operations, it could be provided via other sea or air assets.

The littoral component commander controls the coastal regions while GCC moves inland if necessary. Boundary adjustments are made by simple movement of component boundaries instead of establishing and disestablishing AOAs. Should ACCs have their own areas? This is debatable. If so, the areas should be sufficiently far from the littoral component commander and GCC front lines to allow these commanders to shape the battlefield as they see fit.

our fascination with technology has led us to believe that we are driving RMA

How can the Navy and Marine Corps drive this vision? It may mean a radically different approach to naval warfare. Placing Army tactical missile or multiple launch rocket systems aboard Navy ships would be a major step. Advanced precision guided technology is on the horizon; and distributed, shop-to-consumer, sea-based logistics which eliminate large supply dumps is possible. Tanks may be obsolete by 2020 because of precision guided munitions. The MV–22 and CH–53E (or its successor), combined with carrier-based air and RMA weaponry, may render conventional land-based, tube artillery obsolete within 300 miles of the coast. The day might also come when JFCs only need a littoral component commander and ACC for an operation.

The current concern over roles and missions should not be focused on whether naval forces should have tanks or fixed-wing manned aircraft. Both in fact may be sunset systems, a point that remains open to debate. One should not defend any capability without considering the future of war. The real debate should be over new concepts to guide new paradigms.

Enter Sea Dragon

U.S. forces could implement the vision of littoral componency by means of a combination of tactics, techniques, and procedures roughly grouped under Sea Dragon: a view of naval combat in which platoon-sized groups from the sea range over a battlefield, bringing down accurate fire on an enemy in unprecedented volumes. The object is to make platoons as capable as battalions once were. If we achieve this vision with sea-based fire support and ship-to-objective logistics, we can create a genuinely different approach to warfighting. By eliminating large formations in one place to dominate the battlespace, we can fight smarter, more economically, and with fewer casualties.

The Sea Dragon initiative calls for a radically new, decentralized style for our landing forces which will have eyes everywhere but will present large fixed targets nowhere. What they can see, they can kill. Their battlefield will be a distributed one where to mass is to die. In Marine forces ashore, sergeants will do what captains did previously; lieutenants will command battlespace once covered by lieutenant colonels. Anything big and slow will become a target and will be destroyed on sight. Traditional artillery, tank formations, and massed armored infantry will become liabilities rather than advantages.

The way wars are fought is going through a dramatic transformation. Though not without merit, the system of systems concept—composed of precision strike, dominating maneuver, space and information warfare, and such—does not in and of itself constitute a revolution. Our narrow fascination with technology has led us to believe that we are driving RMA. But nothing could be farther from the truth, and we cannot afford such technical arrogance. We must realize that we do not have a monopoly on new technology. Consequently, we must creatively adapt both doctrine and organizations to these innovative technologies.

In the long run we must recognize that revolutions only indicate the direction in which we are heading. These trends should not be regarded as the definitive future of war. We must remain open to new ideas and developments, such as littoral componency and Sea Dragon, and move out of the narrow tunnels of technocratic thinking by making decisions based on logic and experience. This will ultimately be a source of strength and ensure that any potential enemy who ventures near the littorals will become a victim, not a victor. **JFQ**

NOTES

[1] William Owens, "The Emerging System of Systems," *Military Review*, vol. 75, no. 3 (May–June 1995), pp. 15–19, and "Breakthroughs Could Give Forces Total Command of Future Battlefield," *Inside the Navy* (January 23, 1995), p. 3.

[2] Earl Tilford, Jr., *The Revolution in Military Affairs* (Carlisle Barracks, Pa.: U.S. Army War College, 1995), p. 12.

[3] U.S. Department of the Navy, *Copernicus . . . Forward, C4I for the 21st Century* (Washington: Government Printing Office, 1995), p. 7.

[4] Kenneth F. McKenzie, Jr., "Beyond the Luddities and Magicians: Examining the MTR," *Parameters*, vol. 25, no. 2 (Summer 1995), p. 15.

[5] Michael Mazarr, *The Revolution in Military Affairs: Framework for Defense Planning* (Carlisle Barracks, Pa.: U.S. Army War College, 1994), pp. 30–31.

[6] Ralph Peters, "After the Revolution," *Parameters*, vol. 25, no. 2 (Summer 1995), p. 8.

[7] Martin Van Creveld, *Command in War* (Cambridge: Harvard University Press, 1985), pp. 248–49.

[8] Bruce D. Nordwall, "Cultural Shift Key to New Concept," *Aviation Week and Space Technology*, vol. 143, no. 5 (July 31, 1995), pp. 40–41.

[9] Terry C. Pierce, "Taking Maneuver Warfare to Sea," *U.S. Naval Institute Proceedings*, vol. 121, no. 4 (April 1995), p. 74.

[10] U.S. Department of the Navy, Naval Doctrine Publication 1, *Naval Warfare* (Washington: Government Printing Office, 1994), pp. 31–34.

[11] Pierce, "Taking Maneuver Warfare to Sea," pp. 74–77.

This article was submitted as an entry in the 1995 RMA Essay Contest.

Soldiering.

DOD

War, Politics, and RMA—

The Legacy of Clausewitz

By ANTULIO J. ECHEVARRIA II

Over the last few years practitioners and students of war alike have debated the nature and impact of the revolution in military affairs (RMA) on future war, especially with its emphasis on speed, precision, and intelligence rather than the mass production and target saturation so characteristic of industrial-age warfare. Moreover, analysts have pondered the impact of RMA on the structure and philosophy of the Army of the 21st century, conflicts short of war, and information warfare. All of these observers agree that even though older forms of war will continue to coexist with newer ones, RMA, when complete, will mean that future war will differ fundamentally from wars of the past. It will include more intelligent warriors, knowledge-oriented weaponry, a five-dimensional battlefield (namely, breadth, depth, height, space, and time—the ability and subsequent need to act within an enemy's decision cycle), global envelopment, capabilities to attack simultaneously and precisely on the tactical, operational, and strategic levels, and an explicit "civilianization of war" in terms of increased direct and indirect public participation. In addition, RMA will likely challenge statecraft as diplomats adapt to the flow of real-time data, its

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effect on public opinion, and the uncertain political capabilities and limits of future war.

Given the extent of such change, does the thought of Carl von Clausewitz, developed one hundred and seventy years ago, offer anything to warfighters of the future? Indeed, some say that Clausewitz's funeral rites are overdue: "[Future] war will be fought not to pursue national interests, but to kill enemy leaders, to convert opponents. . . . Thus the core of Clausewitz's philosophy of war—that states wage wars using armies in pursuit of political objectives—will disappear."[1] Some think that nuclear weapons, transnational constabulary warfare, anti-terrorism, counter-narcotrafficking, and greater compartmentalization among political and military leaders render obsolete the Clausewitzian definition of war as an act of policy and his tripartite concept of war.[2] Moreover, the relevance of *On War*[3] appears suspect for not addressing war as a cultural phenomenon: it not only fails to explain why wars occur, it views war from the perspective of the Western nation-state paradigm.[4] However, such arguments fundamentally misunderstood what Clausewitz meant by politics. In fact, despite technological changes introduced by RMA—as well as those brought about by nuclear weapons—his conception of war remains valid.

despite technological changes from RMA his conception of war remains valid

In Search of *Politik*

Clausewitz's description of war as a "continuation of politics (*Politik*) by other means" is well known but unfortunately is often interpreted to mean that war is merely an act of state policy aimed at achieving political aims. Part of this confusion stems from the ambiguity of the term *Politik,* which means both policy and politics. But Clausewitz also deserves some blame for neglecting to define in simple language how this multivalent term was to be understood. German scholars and soldiers alike have puzzled over that since the last century. Eberhard Kessel argued, for example, that for Clausewitz *Politik* consisted of subjective and objective elements. The former related to choices by political leaders about the type of war to wage and the specific aims to pursue. The latter involved dominant ideas, emotions, and political interrelationships unique to a given time and place.[5]

In fact, Clausewitz's varied use of *Politik* and the context in which he wrote indicate that he signified three things with the term. First, it meant policy, the extension of the will of the state, the decision to pursue goals, political or otherwise. Second, it meant politics as an external state of affairs—strengths and weaknesses imposed by geopolitical position, resources, treaty, etc.—and as a process of internal interaction between key decisionmaking institutions and the personalities of policymakers. Last, it meant an historically causative force, providing an explanatory framework for examining war's various manifestations over time.

The first definition appears principally in the first chapter of *On War* which discusses the nature of war. A prefatory note indicates that Clausewitz considered only this chapter to be in final form. But one must resist the temptation to read no further, for while it might appear that the essence of Clausewitz's message can be grasped in 15 pages rather than 600, this is not the case. As one authority observes, strong though circumstantial evidence suggests that the note was written when *On War* was closer to completion than generally believed.[6] Thus, individuals seeking a "genuine understanding of Clausewitz cannot escape the task of actually reading *On War*."[7] Indeed, one should read his other works as well. For example, his notes on history and politics and the essay on "Agitation" (*Umtriebe*) reveal that his ideas were continually evolving. The hefty tome *On War* constitutes barely a third of them.[8] Clausewitz is often clearer when read in German, but the prerequisites for understanding this great theorist are really patience and a will to reflect.

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Karl Philipp Gottlieb von Clausewitz.

Political Forces

The final three books of *On War*—on defense, attack, and war plans—contain the majority of Clausewitz's mature ideas pertaining to the influence of politics on war. They also disclose that his military thought was becoming increasingly historicist. He sought to interpret historical epochs on their own terms and understood that those who lived and fought in past wars were governed by institutions, values, and beliefs unique to a specific time and place. In "The Scale of the Military Objective and of the Effort To Be Made," Clausewitz broadens his concept of *Politik* to encompass the first and second definitions mentioned above. He refers to policymaking, for example, as more than a mere act of intelligence or product of pure reason: It is "an art in the broadest meaning of the term—the faculty of using judgment to detect the most important and decisive elements in the vast array of facts and situations." This judgment, in turn, was highly subjective, affected by "qualities of mind and character of the men making the decision—of the rulers, statesmen, and commanders, whether these roles are united in a single individual or not." States or societies were not limited in form to monarchies (constitutional or absolutist) and semi-rigid social hierarchies

characteristic of his day, but "determined by their times and prevailing conditions." A state, for instance, can be a united, sovereign entity, a "personified intelligence acting according to simple and logical rules," or merely "an agglomeration of loosely associated forces." Hence, the definition applies equally to feudal rulers, drug cartels, or terrorist groups. Even numerous European military institutions (for instance, armies and command structures) have "differed in the various periods." In fact, in his later books Clausewitz uses the term *military* to mean all institutions, procedures, philosophies, and values of the military as a community.

Clausewitz employed several historical examples to show how policy and political forces have shaped war from antiquity to the modern age. His chapter "The Scale of the Objective" includes vastly different yet profoundly similar wars of conquest and plunder carried out by semi-nomadic Tartars and those of expansion prosecuted by Napoleon's armies. Selecting the Tartars as an example of politics directing war is significant, for some would claim that their "tribal societies" fall outside the Western nation-state paradigm.[9] Tartar tribes originated in Central Asia along with other Turkic peoples. In the 12th and 13th centuries they were overtaken by Mongols and mixed with them. They participated in Mongol invasions of eastern Europe and the Middle East.[10] They eventually converted to Islam and joined in Ottoman *Jihads* (holy wars of conversion) against the West. Tartar bands even raided Prussia in 1656–57, burning hundreds of villages, killing 23,000, and enslaving 34,000.[11] They thus fought for booty, to convert infidels, to kill enemy leaders, and for entertainment—all motives for future war as cited above. Yet, such motives, as Clausewitz knew, were shaped by resources available to the Tartars, their geopolitical role as a composite of Turkish and Mongol nations located in Central Asia, their nomadic culture and traditions, and the religious influence of Islam. These factors all fell under the rubric of political forces in Clausewitz's mind.

While the Tartar system of formulating policy appears less sophisticated than that of Frederick the Great or Napoleon Bonaparte, it proved no less decisive in developing strategies and directing military force in pursuit of political objectives. As seen in this example, Clausewitz's use of *Politik* affords both a transhistorical and transcultural perspective on war, one that at the same time respects historical and cultural uniqueness. Thus the elements that shape policy are both situational and cultural, objective and subjective (or rational, nonrational, and irrational according to political-scientific models).[12] "The aims a belligerent adopts, and the resources he employs, will be governed by the particular characteristics of his own [geopolitical] position; but they will also conform to the spirit of the age and to its general character."

technological advances affect the grammar of war, not its logic

Technology and the Trinity

With a more complete understanding of what Clausewitz meant by *Politik*, we can examine his tripartite conception of war in some detail. This "remarkable or paradoxical trinity," as it has been called, is Clausewitz's framework, or model, for understanding the changeable and diverse nature of war. The forces that comprise it—blind emotion, chance, and politics—function like "three different codes of law, deeply rooted in their subject and yet variable in their relationship to one another." They, in turn, correspond to three representative bodies—the character and disposition of the populace, skill and prowess of the military, and wisdom and intelligence of the government.

Despite revolutionary advances in technology, this trinity remains relevant to future war. Technology does not require adding a fourth component to the trinity, squaring the triangle, as has been suggested.[13] Technological advances will not alter the framework of war since they affect the grammar of war, not its logic. In other words, new technologies change only war's form, not its nature. War is multidimensional and chameleon-like, composed of subjective as well as objective natures. The former consist of war's means. Since they vary over time and place, Clausewitz dubbed them subjective. The latter, on the other hand, embrace elements of violence, uncertainty, chance, and friction; and while embodying many varieties and intensities, they remain a constant part of war despite time and place. Moreover, because war is not an autonomous activity but a social and human event, it has two tendencies, escalation and reciprocation. Absent the moderating influence of policy and debilitating force of friction, these tendencies push warfighting toward a violent extreme. Thus, for Clausewitz war might change color like a chameleon, but its essential nature remains constant—violent, unpredictable, and prone to escalation.

Technology, in fact, resides in all elements of the trinity without altering their inter-relationship. Military technology, for example, might be defined as any technology used by a nation's forces for military purposes. While items such as missiles fall in the military corner of the trinity, their component technologies (such as microchips) usually originate in the private sector. Indeed, technologies related to communications and transportation have broad application in all branches of the trinity, thereby defying pat labels. The point is that the interdependency of various components of the trinity will remain unchanged despite technological advances. The evolving information and communication technologies of RMA will simply expand the immediacy—by shortening response times and heightening sensitivity—for each component in its interaction with the others.[14]

Information technology will certainly demand increases in the intelligence levels of military personnel and civilians alike, or at least oblige them to process more information in less time. But it will not change the fact that ruling bodies—legitimate governments, revolutionary cells, terrorist gangs, or drug cartels—will make decisions on

when, where, how, and why to apply force. Their decisions will be influenced by political forces such as power relationships linked to alliances and treaties (either perceived or real), the effectiveness of key institutions involved in decisionmaking, and general assumptions, beliefs, and expectations held by decisionmakers. Events surrounding the Cuban Missile Crisis and October 1973 War reveal that even in the modern age misperceptions continue to create and/or exacerbate crises.[15] Technology will speed the transmission of information (already approaching real time), even provide it in new forms (such as satellite imagery), and may, depending on the scenario, reduce or expand the time for making decisions. But decisionmakers will continue to receive a vast quantity of information through subjective filters; thus, their decisions will remain largely a matter of judgment, and that judgment will be shaped by political forces.

Paradoxically, new technology increases and decreases violence, chance, uncertainty, and friction in unforeseen and uneven ways. New weapons systems enable both sides to observe and strike simultaneously throughout the depth of a battlefield, thus eliminating safe areas. The five-dimensional battlefield means that operational commanders must consider defeating either an attack or a counterattack from various directions at any time. A general "lack of immunity" will prevail as units at all echelons of command and control endure greater risk.[16] Precision-guided weapons and munitions do increase the certainty of a hit or kill, but the weak link will be supplying reliable and timely target data.[17] Enemies will take measures and countermeasures against this, and tactics will change as a result. Thus new technology alone will not prove decisive in future war; it will require a harness of sorts—a flexible, comprehensive doctrine that integrates the tactical, operational, and strategic levels of war. The objective nature of Clausewitz's concept of war will remain relevant.

The Nuclear Factor

Even the development of nuclear arms, the so-called absolute weapon, has not meant the death of Clausewitz,

USS Cape St. George firing SM–2 standard missile.

U.S. Navy (Johnny Wilson)

as some claim.[18] His dictum that "war is the continuation of *Politik* by other means" is as valid in a nuclear conflict as in conventional war. The evolution of nuclear strategy from massive retaliation in the 1950s to flexible response in the early 1960s, for instance, shows how *Politik* affects war even in the nuclear age.[19] Since 1945 policymakers have duly responded to changing situations, growing strike and counterstrike capabilities, and the will of the populace by determining that, because of attendant risks, nuclear war did not suit national objectives; hence, other more conventional forms of war received more attention while nuclear weapons assumed a deterrent role. Policy and politics have patently conspired to force the avoidance of nuclear war.

Clausewitz's thought does not insist that warfare serves a purely rational aim

The destructive power of nuclear weapons, prospect of runaway escalation, and concept of superconductivity—the elimination of friction by reducing the chain of events between the *decision* to launch and the *actual* launch of a strike—will reduce or negate the influence of policymakers on nuclear war should it occur.[20] Obviously, until the technology is developed to harmlessly disarm nuclear weapons in flight, the possibility of aborting or down-scaling nuclear war after a launch is minimal. But such realities are merely products of the times and constitute what Clausewitz, in his historicist approach, would have considered the subjective elements of war—means selected for its prosecution—that distinguish nuclear war from other forms of conflict in the nuclear age. It might be an exaggeration to claim that such means are the ultimate expression of the remarkable trinity in terms of absolute war, but not by much.

Again, Clausewitz's mature thought does not insist that warfare serves a purely rational political aim. In any event, the definition of a rational political aim is largely subjective. A terrorist

group can launch suicide bombings that it considers completely rational. Indeed, the current world order advances the possibility of a limited nuclear exchange between states or groups which have relatively small arsenals.[21] Far from restricting the influence of *Politik* over war, such a climate is likely to increase it, while admittedly reducing the time policymakers have to react to a strike.

Nuclear weaponry does not render irrelevant the intelligence of the government, skill of the military, and emotive force of the populace as some believe. Rather, the advent of such weapons and attendant strategies reveals that each component of the trinity changes over time. Diplomacy is more aware that military action of any sort might generate unintended consequences and runaway escalation, and it has developed systemic checks and precautions to prevent that. The military has gradually altered its warrior ethos to prize rather than eschew intelligence and technical expertise. The public has also changed, becoming more educated and politicized, and growing more sensitive to the fact that the future rests in the hands of a few chosen officials. Such developments do not invalidate Clausewitz's trinity but speak instead to its lasting durability and intrinsic dynamism.

Of course, not all of Clausewitz's military thinking remains relevant. His vision of war did not include the economic, air, sea, and space dimensions, for example. But his conception of war, his remarkable trinity, and his grasp of the relationship between *Politik* and war will endure as long as states, drug cartels, warrior clans, and terrorist groups have a mind to wage war. **JFQ**

NOTES

[1] Steven Metz, "A Wake for Clausewitz: Toward a Philosophy of 21st Century Warfare," *Parameters,* vol. 24, no. 4 (Winter 1994–95), pp. 126–32, here p. 130.

[2] John E. Sheppard, Jr., "*On War:* Is Clausewitz Still Relevant?" *Parameters,* vol. 20, no. 3 (September 1990), pp. 85–99; Martin van Creveld, *The Transformation of War* (New York: The Free Press, 1991), pp. 33–62.

[3] Carl Von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976).

[4] John Keegan, *A History of Warfare* (New York: Alfred A. Knopf, 1993).

[5] In its polemics with Hans Delbrück, the German great general staff argued that war was indeed subordinate to politics, but that political forces had changed since Clausewitz's day. They saw politics as a social-Darwinistic struggle for national existence that demanded war be waged to the utmost.

[6] It also appears in Azar Gat, *The Origins of Military Thought from the Enlightenment to Clausewitz* (Oxford: Clarendon Press, 1989), pp. 255–63.

[7] Christopher Bassford, *Clausewitz in English: The Reception of Clausewitz in Britain and America 1815–1945* (New York: Oxford University Press, 1994), p. 7.

[8] These and other essays are found in Carl von Clausewitz, *Historical and Political Writings*, edited and translated by Peter Paret and Daniel Moran, (Princeton: Princeton University Press, 1992).

[9] Keegan, *A History of Warfare*, pp. 11–40; van Creveld, *The Transformation of War,* pp. 33–62.

[10] Douglas S. Benson, *The Tartar War* (Chicago: Maverick Publishing, 1981).

[11] F.L. Carsten, *The Origins of Prussia* (Oxford: Clarendon Press, 1954), p. 208.

[12] See Bassford's discussion in *Clausewitz*, pp. 22–24, and "John Keegan and the Grand Tradition of Trashing Clausewitz: A Polemic," *War in History,* vol. 1, no. 3 (1994), pp. 319–36.

[13] Michael Handel, "Clausewitz in the Age of Technology," in *Clausewitz and Modern Strategy*, edited by Michael Handel (Totowa, N.J.: Frank Cass, 1986), pp. 58–62.

[14] See also David Jablonsky, "U.S. Military Doctrine and the Revolution in Military Affairs," *Parameters*, vol. 24, no. 3 (Autumn 1994), p. 34.

[15] Robert B. McCalla, *Uncertain Perceptions: U.S. Cold War Crisis Decision Making* (Ann Arbor: University of Michigan Press, 1992).

[16] Avraham Rotem, "The Land Battle of the 1990s," in *Technology and Strategy: Future Trends*, edited by Shai Feldman (Jerusalem: Jaffee Center for Strategic Studies, 1989), p. 56.

[17] Shai Feldman, "Technology and Strategy: Concluding Remarks," in *Technology and Strategy*, p. 130.

[18] Sheppard, "Is Clausewitz Still Relevant?" pp. 88–91; and Martin van Creveld, *Nuclear Proliferation and the Future of Conflict* (New York: The Free Press, 1993), pp. 43–64.

[19] The history of nuclear strategy did not end there. Strategies of the early 1960s gave rise to mutual assured destruction, mutual agreed assured destruction, Carter's countervailing strategy, Reagan's strategic defense initiative, etc. Donald M. Snow, *National Security: Enduring Problems in a Changing Defense Environment*, 2nd edition (New York: St. Martin's Press, 1991); Henry S. Rowen, "The Evolution of Strategic Nuclear Doctrine," in *Strategic Thought in the Nuclear Age*, edited by Laurence Martin (Baltimore: The Johns Hopkins University Press, 1981), pp. 131–56; and Fan Zhen Jiang, "Is War Obsolete? A Chinese Perspective," in *Essays on Strategy VI*, edited by Thomas C. Gill (Washington: National Defense University Press, 1989), pp. 189–201.

[20] Stephen J. Cimbala, *Force and Diplomacy in the Future* (New York: Praeger, 1992); and Richard N. Lebow, "Clausewitz and Crisis Stability," *Political Science Quarterly*, vol. 1 (Spring 1988), pp. 81–110.

[21] Jerome Kahan, *Nuclear Threats from Small States* (Carlisle Barracks, Pa.: U.S. Army War College, Strategic Studies Institute, 1994).

The 1995 RMA Essay Contest: A POSTSCRIPT

By ANDREW W. MARSHALL

As the preceding articles demonstrate, there is a serious debate today over whether we are going through a period of revolutionary change in warfare and what that change may be. Many of those who have studied this question believe that we are indeed in the initial stages of a revolution in military affairs (RMA) that will result in dramatic conversions in the character of war.

The current era resembles the decades of the 1920s and 1930s when major shifts occurred in land, sea, and air warfare. Several lessons emerged from that interwar period, including the fact that the military organizations that performed best in World War II were those which innovated most successfully in the interwar era. The most critical factor to success was not technological surprise but the adoption of innovative operational concepts and organizations to exploit commonly available systems. Perhaps the most important aspect of successful innovation was the articulation of a clear and compelling vision of warfare early in the process of change. The origin of *Blitzkrieg*, aircraft carrier strike forces, amphibious warfare, and long-range airpower theory can be traced to the years immediately after World War I, a critical period in theoretical work and experimentation.

While there appears to be a growing consensus that major changes in warfare are underway—similar in scope to those of the interwar period—a coherent vision of how warfare might look by the year 2015 and beyond seems lacking. Desert Storm provided a glimpse of some likely systems and technologies; but the operational concepts and organizations to fully exploit them have yet to be developed. Profound innovation appears more challenging today than in the 1920s since critical aspects of future warfare may center less on tangible platforms than on concepts—especially those related to command and control, which are difficult to envision, model, and simulate. At the same time, the rapid pace of technological change may demand a much faster rate of innovation than we have ever experienced.

Although there are service initiatives to deal with RMA, none have focused on stimulating critical thinking within the broad population of potential innovators. This highlights the importance of initiatives like the *Joint Force Quarterly* RMA Essay Contest. Such a competition offers a rare incentive for individuals concerned with military affairs to depart from near-term operational issues and focus on long-range visions which portend profound change. This year's entries made it clear that the contest achieved its purpose of stimulating such thinking. The backgrounds of the entrants—especially heavy active duty and junior officer participation—was particularly encouraging.

The 1995 contest has established a solid basis for theoretical discussion. Nevertheless, we undoubtedly have a good way to go in thinking through all the implications of this ongoing RMA. It is likely to take many years of concerted effort, through many initiatives, to generate the breadth and depth of thought needed to deal with the military challenges of the 21st century.

In addition to generating ideas, the contest served to expose officers to new concepts and the need for change—especially those who will lead the Armed Forces when this RMA culminates. Thus it is important that this competition of ideas continue with maximum participation. Those of us in the business of long-range thinking look forward to the entries in next year's contest. JFQ

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TUNING the Instruments of NATIONAL POWER

By HANS BINNENDIJK *and* PATRICK L. CLAWSON

There has been a marked realignment since the end of the Cold War of the instruments of national power which are available to the United States in pursuing its interests around the world. Because of resource constraints and new threats, some former mainstays of defense and foreign policy—such as strategic nuclear forces and foreign aid—are less central today. At the same time, the U.S. Government is developing new techniques to deal with changing circumstances which rely more on coalition partners, high technology, the private sector, and additional roles for the Armed Forces.

The Strategic Setting

In the modern world, the changes related to geostrategy, information, and government are so sweeping that they may be regarded as revolutions. One common characteristic of these changes is that they are transforming the world into a more fast-paced and diverse place in which a more tailored and coordinated approach to policymaking is required. They also increase the means that are available to the United States in exercising its power and influence.

Geostrategy. The most apparent multidimensional changes are geostrategic. In the area of relations among major powers—long the focus of world politics—superpower confrontation was replaced by cooperation in the initial rush of enthusiasm after the Cold War. Now relations with Russia and China are somewhat cooler as they resist further reform and seek to strengthen their international position. Among the powers, the United States is by far the strongest. Nevertheless the world has not become unipolar as some predicted a few years ago.

Another aspect of the geostrategic scene has been the triumph of market democracy. While not always practiced, it is nearly universally regarded as the model approach. From this vantage states can be divided into three groups: those successful at implementing market democracy, those in transition from authoritarianism towards that goal, and troubled states that fall behind the rest of the world while often struggling against ethnic or religious extremism. The most likely sources of conflict are troubled and transitional states. Some rogues may divert attention from their domestic ills by external aggression aimed at imposing regional hegemony. The proliferation of weapons of mass destruction (WMD), particularly nuclear

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Marine anti-terrorism team during Valiant Thunder '95.

U.S. Navy (Lou Caporaletti)

arms, makes confrontations with rogues especially dangerous. Conflicts are likely in troubled states, and in some cases they will fail—ceasing to function and degenerating into societal chaos. Though the United States will not always intervene, it has developed capabilities to conduct humanitarian and peace operations when they are required.

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Perhaps the most striking aspect of the geostrategic scene is the explosion of transnational problems that do not stem from the policies of governments. International crime, terrorism, mass migration, and environmental threats transcend national boundaries and often are not susceptible to traditional tools of statecraft designed for relations among sovereign states.

Information Technology. Advances in information technology are increasing tenfold every five years. Computers, facsimile machines, fiber optics, satellites, and the like speed information across frontiers, reinforcing political trends toward open societies. No one can foretell how this technology will alter traditional means of national power, but certain useful themes are emerging. One is that access to technology is a prerequisite for economic growth, at least in developed states. Another is that the ubiquity of global communication is creating new avenues for American values, culture, and interests to radiate overseas and vice versa. Still another is that information is perhaps the single most important factor in deciding the outcome on the battlefield.

The Nature of Government. After an era of increasing state activity, central governments are in retreat. Power is devolving as more control is ceded to the regional or local level. Central governments are shedding functions, in part to cut budget deficits. Governments are privatizing state-owned enterprises, relying on markets to boost growth, and the power of international firms has grown. Moreover, less concern is directed to projecting power overseas and more at domestic issues, especially the economy. In many countries the argument is made that a strong economy is the only means of sustaining an active international role.

In the United States, domestic concerns have caused a decline in resources which support defense and foreign programs. From FY85 to FY95, funding for defense fell 34 percent in real terms, and funding for international programs fell 46 percent. Administration and congressional mid-1995 projections for defense and international spending both showed a continued reduction in real terms from 1996 to 2000. For defense they agreed on a 7 percent reduction. For international programs the White House projects a 23 percent cut while the concurrent budget resolution projects a 43 percent cut. Furthermore, pressure to

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balance the budget while protecting domestic programs may push reductions for defense above the levels projected in mid-1995 by the administration or Congress. The lower resource levels will pose a serious challenge for exerting our influence over a range of issues and at a level of leadership that U.S. interests require and that Americans expect.

Impact of the Revolutions. While the basic characteristics of the present strategic environment are uncertainty and change, historical experience suggests that the new world system may be more malleable now than it will be in a few years. International systems have typically had a life cycle in which relations among the major powers start out flexible then become more rigid. The way the system is shaped tends to determine whether these powers remain at peace. If that analogy holds, then there is an urgency to resolving the domestic debate on what the United States wants from the new world order and maximizing the instruments of power available to policymakers.

Although changes in the instruments of power have generally been driven by developments in the international environment—revolutions in geostrategy, information technology, and the nature of government—much is the result of conscious decisions made in Washington. The United States is reinventing the ways in which it operates in order to reduce costs, taking advantage of changing circumstances to shed functions and institutions that are no longer needed while making greater use of new opportunities. As reinvention continues the challenge will be to make more effective use of varied instruments which the United States has at its disposal. These instruments can be grouped into three general categories: non-military, political military, and military.

Combat Camera Imagery (Yvette Walden)

The Chairman and Ambassador Albright in Croatia.

Non-Military Instruments

Diplomacy. The nature and tools of diplomacy are changing rapidly. In the more fluid situation of the 1990s, negotiations are shifting from formal to ad hoc arrangements. Attention is being given to merging elements of a diplomatic structure which was created for a different age. Global affairs have been given new prominence at the State Department. Our embassies abroad are less the province of the State Department and more a site of interagency functions under the looser leadership of the ambassador. And as the loss of three colleagues in Bosnia attests, the life of the diplomat is becoming increasingly dangerous.

Information. American Cold War ideology—marked by emphasis on freedom, democracy, and marketplace—has triumphed, although it has not been fully practiced in transitional or troubled states. Public diplomacy is therefore evolving from the battle over hearts and minds to campaigns to persuade foreign governments and publics to support specific national policies. In this effort the U.S. Information Agency plays the principal role, presenting our perspective to a world saturated by commercially produced information and supplementing it, as required, with government assets.

Nonstate Actors. The United States uses international and private voluntary organizations more often today and in more ways than during the Cold War. The military works more directly with them, requiring both sides to adapt, given the obvious differences in their respective cultures (such as command structures versus webs of independent actors that rely on consensus-building). The government not only uses international organizations in responding to disasters and the effects of ethnic strife, but in mitigating the threat to vital national interests from rogue states.

Economics. As in other fields, the trend in economic affairs is away from the commitment of budget resources. Foreign aid is shifting from direct bilateral budget assistance to new ways of mobilizing multilateral resources for vital national interests; for example, creation of the Korean Peninsula Energy Development Organization. But the larger story is that as security threats have declined, the Nation has used existing economic instruments (such as trade retaliation) vigorously against its allies, which may endanger alliances in the long term. But often economic instruments have little impact, in part because the United States does not commit sufficient resources to make instruments such as foreign aid effective. In other cases the collateral impact of these instruments is too great; that is, they have broad consequences that inflict unacceptable political damage, such as when the threat to withdraw China's most-favored nation status resulted in a deterioration of relations across the board. When America is prepared to inflict heavy collateral damage, a coercive economic tool such as sanctions can have a discernible effect. Witness how sanctions weakened Baghdad's ability to threaten its neighbors and Belgrade's support to ethnic Serb forces in Bosnia.

Intelligence. As the focus of national security policy shifted away from the Soviet Union, intelligence activities have been diffused. The debate continues about what intelligence is needed and which areas are appropriate for analysis. For instance, ethical and methodological questions have arisen over the collection and dissemination of economic intelligence on U.S. allies. In those areas where policymakers want intelligence, the information explosion has yielded vast amounts of open-source data. Some have estimated that 80 percent of the information used by the intelligence community is now derived from open sources. Policymakers are likely to get their first report of fast-breaking events from CNN. The intelligence community is accordingly devoting attention to what consumers want and how to package and deliver that information quickly. Greater priority is being given to analysis of the large flow of available information, and less to collecting it.

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Political-Military Instruments

Productivity and Technology. Little attention is given today to industrial mobilization and maintaining an engineering lead (such as jet engines or armor). That results partly from changes in political environment, but perhaps more from the priority given to information technology instead of metal industries. Contrary to concerns that productivity and technological power are in decline, the United States is the leader in information technology, especially in the critical area of software. America's technological base along with its production capacity constitute as potent an instrument of national power as ever. To be sure, the way in which that power will be applied to defense production is changing. More cutting edge research is being done in the private sector and less by the government. As more money goes into electronics, and as the production of major weapons platforms shrinks, more collaboration among businesses, including foreign firms, will be required for the survival of core capabilities (such as building carriers and nuclear powered submarines).

Arms control. The agenda of arms control has shifted to the nonproliferation of nuclear, biological, and chemical (NBC) weapons and missiles, building on the indefinite extension of the Treaty on the Non-Proliferation of Nuclear Weapons. Mutually reinforcing measures—nuclear-free zones, a comprehensive test ban treaty, and a fissile-material production-cutoff treaty—offer promise for strengthening non-proliferation. Meanwhile, conventional arms control models and confidence-building measures implemented with the former Warsaw Pact have relevance for other strife-torn areas of the world. Despite this diversification of effort, Russia remains indispensable to arms control. Its support is vital to supplementing the Treaty on Conventional Armed Forces in Europe, solidifying the emerging system to control dangerous weapons and dual-use technology, and dismantling the legacy of nuclear arms, including the cooperative threat reduction program for greater security of nuclear material to forestall proliferation dangers.

Defense Engagement in Peacetime. Cold War interaction with foreign militaries other than alliance partners often meant providing developing countries with equipment at favorable prices, so as to shore up their ability to meet Soviet-inspired subversion or outright aggression. By contrast, the 1990s have seen a drop in arms deliveries, and a shift in the focus of defense engagement to interaction, such as professional education and combined military exercises, and high-level defense diplomacy, such as quasi-diplomatic trips by regional CINCs. This engagement has expanded to nearly every country in the world, including military-to-military contacts with governments leery of U.S. policies. But at the same time, there has been a decrease in the number of soldiers, sailors, marines, and airmen with foreign-area expertise, as well as a reduction in forces which are likely to take part in foreign military interaction programs (such as engineers, military police, and medics). The challenge is to make better use of declining resources.

Security Relationships and Peacetime Deployment. The core of U.S. security policy in the Cold War was its alliances for collective defense against the external threat from the Soviet Union. The post-Cold War role of alliances is shifting as they become the political and military cornerstones of ad hoc coalitions. Such arrangements are the likely way the United States will fight in the foreseeable future. The NATO combined joint task force (CJTF) concept is the most telling example of the new role of alliances; but delays in implementing it illustrate the difficulty in re-directing Cold War institutions, even where there is clear military utility (in this case, for crisis response beyond NATO's borders). While alliances like NATO provide the military nucleus for an ad hoc coalition, there may well be political utility in including many states, even if some contribute little militarily. Coalitions that include uncertain partners require a delicate balance. Meanwhile, as force structure declines and support at home as well as in host countries for large overseas bases becomes more open to question, dependence on pre-positioned equipment ashore and afloat will

Air National Guard (Mark A. Moore)

Oklahoma City, April 21, 1995.

continue to increase, and there may be a place for new approaches such as mobile offshore bases.

Humanitarian and Peace Operations. The typical peace operation in the past was patrolling a cease fire line. With the end of superpower rivalry peacekeeping operations have generally been focused on resolving conflicts within states rather than on cross-border aggression. Such missions are more complicated and controversial, as there is less control over armed elements and, in some cases, virtually no organized government to work with. The most critical elements to the success of complex peace operations can be the right mix of military and civilian agencies as well as private voluntary organizations, and properly coordinating their actions in the field. In more complicated settings, involvement can make the difference between success and failure because of the skills of the Armed Forces, from C^3I to special operations forces (including civil affairs and psychological operations), and leadership and managerial abilities. While accepting its role, the Nation resists the assumption that it will automatically play a dominant part in every situation, instead preferring to concentrate on how to succeed with limited U.S. participation. The record of success is mixed at best in operations where no peace accord exists and the peace force is perceived to be antagonistic toward one side. The task is to contain or end fighting while not becoming a party to the conflict or assuming responsibility for nation-building. The prognosis for expanded operations of this sort is uncertain. The United Nations admittedly lacks the capability to manage such missions, which means that they are likely to occur successfully only when Washington opts to lead a coalition.

Military Instruments

Unconventional Responses. U.S. interests may be challenged by indirect means such as terrorism, subversion, narcotics trafficking, and sudden flows of refugees. Some kinds of threats are useful ways for the weak to attack the strong. Lately, they have become more salient because of the demise of the Soviet Union and the trend toward a more open world economy and the freer movement of people. Ultimately, regional powers intent on systematically challenging our national interests may mount unconventional threats. Responses to them will include an enhanced role for law enforcement agencies. Unconventional military responses offer options to decisionmakers who are reluctant to resort to costly measures; and they can minimize collateral damage. However, unconventional instruments are politically sensitive.

Limited Military Intervention. In recent decades insurgencies were essentially ideological and the United States supported one side. Today insurgencies and civil wars are more often fought among ethnic groups, and the U.S. goal is peace between two sides, one of which is usually the internationally recognized government. While interethnic conflicts may become frequent events, Americans may not always support involvement in them, since they often occur in regions where geostrategic interests are slight, although challenges to our values (such as genocide) may be high. When the United States does become involved, its goals may be very limited. In light of the record of the United Nations, especially in Somalia and Bosnia, the decision to intervene will depend on the objectives, command and control, contributions by like-minded nations, and duration and cost.

Classical Military Power. While the United States is much more capable than any potential enemy, strategic assets such as airlift and sealift would be strained in the event of two nearly simultaneous major regional contingencies. Also, since the overseas presence of our ground and air forces was reduced by half between 1986 and 1995, there is less margin for error in deploying our remaining forces. And given that weapons systems last decades and relatively little is being procured, the Nation will be fielding equipment designed for use against the Soviet Union for the

Somali women drawing water.

U.S. Navy (Joe Gawlowicz)

foreseeable future and must adapt it to new types of warfare. Unless spending on procurement is accelerated, the military could face bloc obsolescence of equipment in fifteen to twenty years. Perhaps more important than equipment is doctrine: knowing how to fight. Each service has updated its doctrine during the past few years, and now the focus must shift to the development of more joint doctrine.

more important than equipment is doctrine: knowing how to fight

Emerging Military Instruments. Information technology offers the best opportunity for the Armed Forces to develop new instruments in the mid-term. But to benefit from these capabilities, through a military technological revolution, innovative operational concepts and organizations are required, namely, a revolution in military affairs. We are on the verge of integrating systems into what the Vice Chairman, Admiral William Owens, refers to as a *system of systems*. This supersystem could see all key enemy assets on a battlefield (through "dominant battlefield knowledge"), communicate this information instantly to combat units, and strike with unprecedented accuracy. With insightful leadership and hard work this will provide a high degree of control over global security through a capability to intervene quickly, effectively, and economically. In some cases that intervention will be done by the Armed Forces directly, whereas in others it will be achieved by providing real-time intelligence, systems expertise, and software to our allies. One caution: the effective use of emerging instruments requires protecting military information and other systems to avoid retaliation in cyberspace. Although there is considerable interest in information war, it is not clear how vulnerable potential adversaries may be, especially those that are not heavily dependent on modern computer technology. It is clear that we are vulnerable.

Countering WMD. The end of the Cold War was punctuated by new threats from regional powers. Rogue states with NBC capabilities are dangers that must be considered despite programs to prevent proliferation. Thus attention is being devoted to countering WMD. The first choice is deterrence, but that may be difficult to achieve regionally. A rogue with NBC capabilities may use them as weapons of choice, whereas previously that may have been a last resort. Moreover, it may not be credible to threaten a nuclear response against a chemical attack. Because of problems in deterring regional states, more emphasis is being put on defensive measures. Some are passive, like intelligence and NBC protection. Active defenses, such as theater high-altitude area defense, become more important as ballistic and cruise missiles become more widely available.

Some Conclusions

There has been an understandable tendency to put greater emphasis on domestic concerns of late, resulting in calls for cuts in the budgets of most instruments of national power, as well as for

reorganization or fundamental reform of many foreign policy institutions. Five conclusions can be drawn about applying U.S. power in this new environment.

New Ways of Applying Power. Enhancing our ability to exert influence abroad does not necessarily mean buying more of the same old thing. The national security establishment evolved largely out of the Cold War. New ways of doing business are being developed to draw on untapped strengths of existing organizations while shifting resources from areas that are no longer relevant. For instance, transnational threats are becoming more critical relative to concerns over aggressive destabilizing states, which demands a greater role for Federal law enforcement agencies that have traditionally kept a relatively low profile abroad. Another example is the information revolution in which technological innovation is driven by commercial capital rather than government investment. The military will no longer be the principal sponsor of technological innovation and, consequently, the Armed Forces face the challenge of adapting rapidly advancing commercial technologies.

the Armed Forces face the challenge of adapting rapidly advancing commercial technologies

Phasing Down Use of Some Instruments. As the United States diversifies its instruments, reliance on some that were central in the past is declining. For example, America is foregoing the capability to retaliate in kind against chemical or biological weapons, has drastically reduced its reliance on tactical nuclear weapons, and is dismantling much of its inventory of strategic arms. It has also effectively ended military aid (save to Israel and Egypt), other than minuscule amounts for education and training. The United States once carried out functions for which it no longer has adequate resources to have substantial impact. For instance, the goverment is no longer a key actor in international radio broadcasting and economic development, although it still funds some broadcasting (especially the Voice of America) and some foreign aid.

Working with the Private Sector. Government will need to rely more on the private sector in its conduct of national security policy. Voluntary organizations often provide humanitarian relief more effectively than governments. Sometimes an eminent private citizen can explore ideas with rogues, without the Nation extending legitimacy by direct contact. Businesses, acting out of self-interest and without governmental intervention, can often advance U.S. goals, as when investors stimulate economic growth that, in turn, reinforces market democracy or that cements a fragile peace. As the private sector grows in former state-dominated economies, and American firms operate in a global market, the Nation has increasing opportunities to exert its influence. But there are limits. Firms doing business abroad cannot defend national interests. The pervasiveness of popular culture—music, sports, and designer names—and the strength of high-tech industries—computer software and aerospace—can contribute to national power, but it is not a basis for leadership in national security. Regardless of the extent to which economy and culture are globalized, traditional governmental activities remain key to defense and foreign affairs.

Applying Instruments to Limited Ends. Past competition with the Soviet Union meant that most international events involving U.S. interests came into play as part of a global chess game. In a multipolar world of uncertainty and ambiguity, the Nation is likely to be engaged to promote limited interests. Given the stakes, it may not be credible for Washington to threaten to use the full range of instruments at its disposal even if warranted. There will no doubt be cases when a small commitment may be made but without the public will to enlarge that commitment.

Coordinating Among Instruments. While coordinating government agencies has always been a problem, the challenge is growing for several reasons. During the Cold War, coordination among agencies and policy instruments was simplified by the overwhelming priority given to containing Soviet communism. In the post-Cold War era, there is less clarity about which goals are central and which are peripheral. And because a wider array of policy instruments is being used, there are more agencies among which policy has to be coordinated.

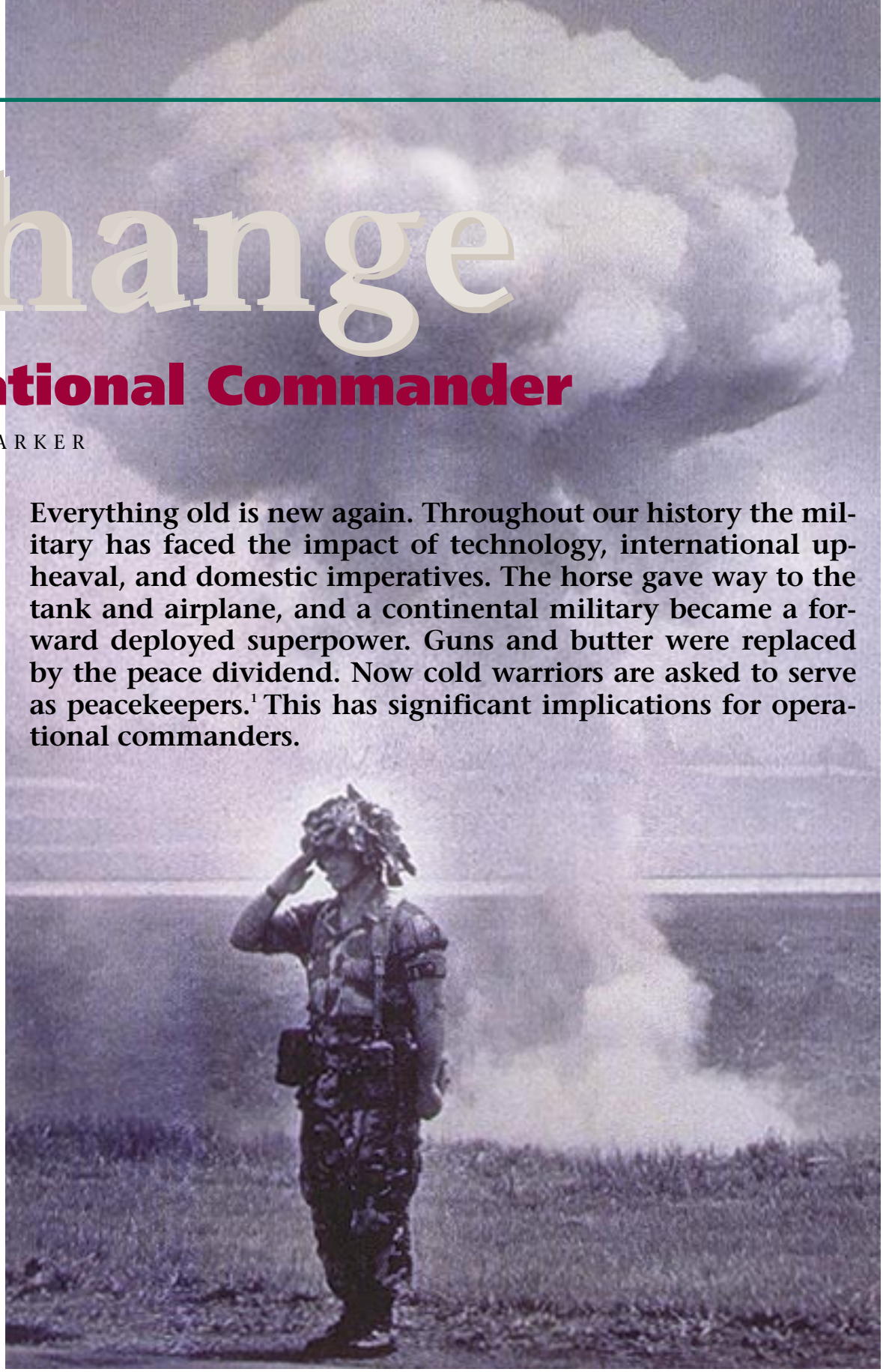
As foreign policy goals become more complex and a greater variety of instruments are brought to bear on any one problem, interagency coordination and clear policy direction become all the more important. Close coordination among agencies and consultation between the administration and Congress are potent force multipliers. To this end, attention is being given to drawing lessons from earlier complex crisis management efforts.

Despite resource constraints, the Nation has an impressive array of instruments of national power and influence that are being adapted to changing circumstances. While there may be defects in how the United States uses those instruments, it has succeeded in achieving many of its goals, and the efficiency of such capabilities continues to improve steadily. If the resources continue to be cut, however, this optimistic assessment could be reversed. **JFQ**

Change and the Operational Commander

By JAY M. PARKER

Everything old is new again. Throughout our history the military has faced the impact of technology, international upheaval, and domestic imperatives. The horse gave way to the tank and airplane, and a continental military became a forward deployed superpower. Guns and butter were replaced by the peace dividend. Now cold warriors are asked to serve as peacekeepers.[1] This has significant implications for operational commanders.



U.S. Navy (Ted Saloïs)

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Commanders from theater level down serve at the crossroads of change. They perform the key role of identifying the need for change and advising the senior leadership on how to respond. But most importantly, they ensure those responses are then implemented. To do this, commanders introduce innovative doctrine and technology. They must adapt the existing force to new missions, organizations, and equipment while offering timely and accurate feedback to superiors. They must grow the future force and its leadership. Finally, as warfighters, they must face the ultimate test of leading the force in battle.[2]

Commanders must swim against the tide—both individual and institutional—that has often frustrated those who attempt to adapt forces to the challenges of a new era. The personal stakes are high, but the cost of failure is much greater. At Manassas and Pearl Harbor, in Korea as well as Desert One, we paid the price for being unprepared. Although many studies chart how the military responds to change at the macro level, the following article deals with the operational level, using theories of organizational behavior, communication, and psychology to ascertain the barriers and how to overcome them.[3]

commanders are responsible for initiating decisions to ensure the diffusion of innovation

Understanding Change

Two facts serve as competing forces in the process of change. The first is that change is the only true constant. The second is that individuals and organizations routinely deny this reality in the belief that the status quo is permanent and desirable. The inertia of this denial must contend with the impetus of change. Also debate over change is often misdirected. At issue is not whether change should occur. Ultimately, no effective barrier exists. There are, however, many barriers to *effective* change. The difference is found in the outcome. Organizations in general and the military in particular either emerge stronger or are defeated and replaced.

Two social scientists who surveyed the body of literature on innovation, communication, and individual and organizational dimensions of change distilled definitions that help to probe the role of operational commanders as implementors of change. First, they defined social change as "the process by which alteration occurs in the structure and function of a social system.... Change occurs when a new idea's use or rejection has an effect."[4] Compared with the description of detailed change types, the two step *contingent decision* requiring prior innovation decision is the most suited to change in the military. The initial decision is an *authority decision*, made by the senior leadership and requiring action by subordinates, regardless of their opinion on the mandated change.[5] The subsequent decision by subordinates to implement the leadership's decision also is, strictly speaking, an authority decision. It differs from the first in that the subordinate (in this case an operational commander) must implement decisions, though he remains somewhat autonomous.

Another analyst derived six major motives for change in the military, namely, technology, budgeting, interservice rivalry, leadership, intraorganizational group conflict, and the impact of the international security environment.[6] But these motives are normally above a commander's level of control; he mainly affects change through advisory input to policymakers. Commanders are, however, responsible for initiating contingency decisions to ensure the diffusion of innovation.[7]

The force modernization initiatives in the 1970s and 1980s illustrate both how this occurs and its consequences. With new systems came changes in force structure, maintenance, logistics, and contingency planning. The Abrams tank and Bradley fighting vehicle significantly enhanced the firepower available to heavy task force commanders. The ability of armored forces to shoot on the move and the arrival of an improved antiarmor standoff capability for mechanized infantry were matched by force structure changes at unit level that upgraded the concentration and control of firepower on the battlefield. They were also complimented by the modernization of field artillery, air defenses, attack helicopters, and other capabilities, as well as combat, combat support, and combat service support assets.

But with the new technologies and organizations came challenges. Simple systems became complex, and complex systems required complex maintenance and repairs. Both the Abrams and Bradley required a logistics capability that could refit and refuel forward while keeping up with the new high speed vehicles. Task force commanders, who once might have focused only on the low technology of infantry riflemen and tanks that had changed little since World War II, had to train, maintain, sustain, and fight a complex array of weapons and support systems.[8]

The Gulf War further illustrated the demands changes place on operational commanders. Viewed as a triumph of technology and force rebuilding, this conflict also showed the limitations of some changes. For example, the flood of information available complicated the commander's

task and had unintended consequences by diminishing control. "The constant pressure of the data stream," Eliot Cohen has observed, "together with the growth of nighttime operations, means that leaders try to keep on top of events at the cost of sleep and acuity." It also complicates readiness and training. Overdependence on futuristic capabilities and detailed information risks the inability to operate without them. The high-tech Goliath could be easy prey for a low-tech David. "Future warriors," Cohen noted, "may paradoxically find themselves all the more at a loss when the real world differs sharply from a familiar cyberworld." [9]

While on the surface it is possible to isolate individual elements such as technology which lead to change, seemingly distinct elements of change are frequently interrelated. For example, the defense buildup that made the Abrams and the Bradley possible was related to the Soviet invasion of Afghanistan and other international shifts. Increases in defense spending since the late 1970s enabled the Armed Forces to keep up with technology. At the same time, interservice rivalry took a turn. Pressures to increase interoperability mounted after the failure of Desert One, the hostage rescue mission in Iran, and escalated in the wake of Urgent Fury, the Grenada invasion. Confused planning as well as incompatible communication and fire support systems led Congress to mandate a series of initiatives in joint doctrine, planning, training, and personnel policies.[10]

Halsey demonstrates one of the greatest barriers to change—personal beliefs and instincts

Commanders—burdened by dramatic changes in weaponry—had greater responsibility for integrating the capabilities of other services into planning and operations. The competition to find quality officers for their units was complicated by requirements to assign those same individuals to crucial joint billets. Outstanding officers could no longer secure their futures by following the path of their parent service.

Budget fluctuations have also brought challenges of downsizing units and limited training funds. Traditional military leadership has been stressed by dramatic changes in the social makeup of the force. Over the last twenty years, leaders have had to adjust their units to the all-volunteer force, more married personnel, greater opportunities for women, and a change from traditional war on isolated battlefields to humanitarian assistance under the scrutiny of television cameras.

Operational commanders cannot defer responsibility for making initial authority decisions to the senior leaders. Nor can they assume that a single order will suffice.[11] Implementing such change at their level means understanding, initiating, and following through on a range of complex actions. These changes are not without precedent. The Soviet military was decimated by Stalin's purges and suffered defeat early in World War II. But it was rebuilt in the midst of war and then overcame powerful German forces.[12] At the same time, the French military—badly demoralized and almost vanquished in World War I—was transformed into one of the largest and most modern forces. Yet it was crushed in a matter of weeks in 1940.[13] If the motives for change are present, and if failing to implement effective responses to change risks national disaster, why do militaries not implement effective change and how much of this failure is the responsibility of commanders?

The Individual

Admiral William ("Bull") Halsey was a visionary. When other surface warriors balked at the idea of naval airpower, he saw it as part of the future. A qualified aviator, he gambled his career on carrier warfare. His subordinates at Midway feared the cost of his absence and worried that surface warrior Raymond Spruance would not understand how to best employ this new weapons system.[14] But at Leyte Halsey's instinct was that of a traditional surface warrior, not an aviator. He left the invasion force behind and went on in search of a battleship engagement. His experience demonstrates one of the greatest barriers to change—personal beliefs and instincts.

Often the most difficult task is discarding the frameworks that we create to explain and deal with daily life. As Walter Lippmann wrote:

The real environment is altogether too big, too complex, and too fleeting for direct acquaintance. We are not equipped to deal with so much subtlety, so much variety, so many permutations and combinations. And although we have to act in that environment, we have to reconstruct it on a simpler model before we can manage it.[15]

Lippmann's argument is at odds with the classic "rational actor" view of decisionmaking. That theory contends that rational decisions can be made by objectively bringing all relevant information to bear on the problem and comparing, first, the "relative effectiveness of alternative means for achieving the goal," then "effects on values other than those that would be fulfilled by achieving the immediate end," and finally by alternative ends in light of costs "in terms of other values." [16] This efficient model provides an optimal outcome; but students of the process of decisionmaking side with

Lippmann more than with the rational actor model. The post World War II "cognitive revolution" in social psychology resulted in a wide range of studies illuminating human behavior in general and decisionmaking in particular. Some detail the obstacles which operational commanders must overcome in their own decisionmaking and in that of their subordinates.

Individuals do not usually approach decisionmaking objectively and comprehensively. People are limited in the amount of information they can process. They develop sometimes naive theories based on experience and longstanding beliefs. When decisions arise, particularly crises, these theories are an individual's default setting. Such cognitive shortcuts are a means of making inferences and decisions with minimal time and energy.[17]

Individuals interpret specific situations in light of more general stored knowledge. They make judgments about events, people, or objects by quickly placing them into *a priori* categories. These economical verdicts guide the retrieval and storage of mental information and fill in missing or ambiguous data with "default values." In brief, information is processed from the top down based on preconceived theories structured to organize and explain the world rather than the harsh realities of new data.[18] In the face of barriers, change is slow and incremental at best. Individuals may go so far as to shut down the evaluation process and come to premature mental "closure" rather than contend with complex decisions.

militaries are subject to unique constraints when they attempt to institute changes

What does this mean for operational commanders and their subordinates? When faced with a crisis decision, existing beliefs and theories will take over as they did in Halsey's case at Leyte Gulf. The results can be positive. Arguably, MacArthur's bold move at Inchon was the result of invoking his long held and consistently exercised theories about maneuver warfare. By the same token, his failure to grasp post-World War II realities led to his inability to understand the global political dimensions of the Korean War and his confrontation with Truman.

"We professional soldiers are traditionally laggard in facing and adopting changes," James Gavin wrote in 1947, "especially radical changes that upset proven methods and the ways in which we have been doing things for years past."[19] Lieutenant General Gavin was clearly an exception to his own rule. Tapped for future greatness, Gavin rose from captain in 1941 to major general and command of the 82d Airborne Division in 1944. Like many of his contemporaries, he was an outstanding leader who successfully implemented changes needed to transform the small, outdated regular Army of the 1930s into the complex, modern force which triumphed during World War II. One of the first officers to volunteer for airborne duty, he was responsible for developing airborne doctrine, training embryonic airborne units, and then leading them in battle from Sicily to Berlin.[20] Later, serving on the Army Staff, he continued to be an innovator. He initiated the development of helicopter tactics, modern missile artillery, and space age technology. He was also an early critic of American military operations in Vietnam.[21] Gavin and many members of his generation who advocated and implemented change exhibited many of the positive characteristics of innovators and "early adopters." They had intelligence and a favorable attitude toward risk and change, and also sought information about innovation, pursued education, and were far less dogmatic.[22]

There are notable exceptions, but the nonrigidity of these officers might have resulted from the fact that many were junior and had seen little or no combat in World War I. The experiences and analogies of that war had limited value for them. Those like Patton, who had been in combat, focused on the innovations that might have broken the bloody stalemate on the Western Front.[23] Eisenhower's goal in Europe was to avoid "the long, dreary, and wasteful battles that bled Europe white in World War I."[24] Gavin's recognition of barriers to change and his skills as an innovator were not always sufficient. In the 1950s he and others faced opposition from the senior civilian and military leadership.[25] Once commanders on the operational level overcome barriers, they must challenge the collective and interactive responses from other quarters within their organizations.

The Organization

The task of changing an organization depends on its type. Militaries are best understood as bureaucracies. The word *bureaucracy* conjures images that are antitheses of precision, efficiency, and professionalism in an ideal military. Yet virtually every definition of bureaucracy refers to the makeup and operation of the military. When Max Weber wrote his classic work on bureaucracy, he selected the military as his model. As bureaucracies, militaries are subject to unique limitations and constraints on large, hierarchical organizations when they attempt to institute changes.[26]

"Organizations, like individuals, are reluctant to accept any change in their environments—whether good or bad—as permanent," notes Anthony Downs, "if such acceptance would

USS Wisconsin firing Tomahawk missile.

U.S. Navy

B–2 stealth bomber.

U.S. Air Force

require them to make a significant alteration in their customary behavior patterns."[27] This bureaucratic inertia is not only understandable, it is beneficial. A bureaucracy is, by definition, a government agency with a public trust. Success or failure has a broader public impact than the profits or losses of a private corporation. Thus stability mitigates risk. Risk for the military is literally a life and death proposition. But the reverse can also be true; failure to change increases risk. The consistent refusal of the British to realize the potential of mechanization and naval airpower jeopardized their readiness during the 1930s. Despite experiences of cavalry against tanks in World War I, Britain continued to cling to the horse cavalry until early in World War II.[28]

Viewed in a larger context and over time, most changes are evolutionary; but their defining moments are often associated with dramatic events. These milestones lead to contradictory forces that affect bureaucratic organizations. First, organizations react by closing ranks and seeking refuge in longstanding procedures. They thus reinforce a shared reluctance to confront information that contradicts the organization's norms and beliefs.[29] At the same time, the organization is faced with powerful external demands to reform and restructure. In democracies, these come from the civilian leadership that funds military operations. The pressures accelerate in the wake of a major mission failure (actual or perceived) by the organization. Following a major success, however, the organization is more risk averse, preferring to rely on proven tactics, techniques, force structures, and technologies. Thus, after such victories as World War II, the Persian Gulf War, or the end of the Cold War, the military has proven itself and is reluctant to accept change regardless of how little relation future challenges may have to the past.[30] Therefore, the military proves unprepared for a limited war like Korea or for modern peacekeeping and peace-enforcement.

DOD

There is some truth in the cliché that armies prepare to fight the last war. Victory constrains rather than frees the victor, and complacency becomes the rule. "In theory," Norman Dixon stated, "a major war should confer benefits on the armed forces of the victor. New lessons have been learned, new technologies developed, and new confidence found. Thus equipped, they should have a head start on preparations for the next war. In practice, the reverse seems to be the case." [31]

It would appear that without external pressures, the military will normally only overcome inertia and move toward change after failures like Korea or Vietnam. Even in such cases, the type of change needed may only be resolved by external political pressure. But the impetus for change is not limited to the debate among national security decisionmakers. In most contemporary cases, the civilian leadership has capitalized on proposals made by officers on the operational level. The rise of Special Forces is frequently credited to President Kennedy. Early Special Forces doctrine and force structure resulted from a clash in the 1950s that operational level officers had with the prevailing doctrine of massive retaliation. Special Forces, it was argued, was an essential element for reacting to challenges all along the conflict spectrum.[32]

education can provide an understanding of innovations and their full implications

In the interwar years junior officers on the operational level proposed changes in doctrine, force structure, and technology. Despite some initial success, those who argued for change after victory often suffered isolation, discredit, and in the extreme, elimination from military service. In Britain, J.F.C. Fuller and Basil Liddell Hart were shunned and condemned by mainstream soldiers for advocating mechanization. It was the endorsement of outsiders such as Winston Churchill that kept these ideas in the forefront even when Fuller was forced to retire.[33]

Brigadier General William ("Billy") Mitchell was an airpower prophet without honor. Like his doctrinal mentor, Giulio Douhet, he faced court martial. American airpower gained ascendancy because of an overwhelming tide of events and political pressure, combined with the realization by the Army and Navy that both would benefit. Mitchell did not live to see this.[34] Liddell Hart wrote that even success of a new idea ultimately costs its advocates. A wall of "obstruction compounded of resentment, suspicion, and inertia" builds up to block the advocates of new ideas. "As the wall finally yields to the pressure on the new idea it falls and crushes him." [35]

This cannot be blamed on individuals. It is the collective pressure of military organization and bureaucratic norms. "It seems quite possible," one critic noted, "that, as well as being agents of change, modern complex organizations are equally well suited and disposed toward suffocating it." [36] Such barriers have been countered by leadership and support on levels above the operational commander. The recovery of the military from Vietnam was largely due to leadership initiatives at the highest levels. This is consistent with research

which shows militaries generating reform internally in the wake of failure.[37] But the success of Grenada and Panama did not hinder force modernization that led to success in the Gulf War.

There are lessons to draw from America's interwar experience. While Mitchell suffered for his advocacy, some survived. George Patton, Dwight Eisenhower, and others championed many of the ideas in America which Fuller and Liddell Hart advanced in Britain. The period between the wars was marked by slow promotions and dismal assignments, but when war came they appreciated the value of their earlier vision.[38] They benefitted from innovative study at staff and war colleges, opportunities to write, and mentors like Major General Fox Conner, the Army chief of staff during World War I. Not all achieved wartime prominence. But America had an able cadre of innovative officers to assign as operational commanders when World War II broke out.[39]

Organizational barriers can be overcome, but not without costs. The recurring patterns for successful change include:

- willingness by the innovator to take professional risks
- awareness of the need for bureaucratic mentors and allies
- awareness of, and involvement in, innovation initiatives by higher military and civilian leadership
- patience with organizational inertia on the part of those advocating change
- patience with those advocating innovation on the part of the bureaucracy.

For operational commanders there are several imperatives for ensuring effective change. First, they must understand their psychological strengths and limitations as well as those of their subordinates. Contending with individual barriers to change requires not only knowing obstacles that exist but how to overcome them. While traits such as openness and risk acceptance are not easily learned at an advanced age and career status, education can provide an understanding of innovations and their full implications. Second, it is not enough to master mainstream doctrine and practices. The school solution must be constantly challenged. Ideas that threaten an operational commander's own domain may provide the best opportunities for success. Patton declared that his saddest moment was the day his cavalry unit gave up its horses.[40] His personal dismay, however, did not stop him from embracing armored warfare.

Next, openness must be renewed. Innovators in one generation may be the obstacles to the next. Many officers who benefitted as subalterns from the favorable innovations of the late 1930s and early 1940s were obstacles to innovators in the 1950s and 1960s.[41] Fourth, as leaders at the crossroads of innovation, operational commanders can also help to mitigate obstacles presented by organizational limitations. Nurturing ideas and mentoring those willing to adopt and advance them are the responsibilities of operational commanders. The leaders who set the command climate can determine the success or failure of innovation.

Finally, in a profession that requires risk to life and limb, risk to professional status can be no less acceptable. The patience needed to have the mainstream accept important innovations may require falling off the usual path of success. For every Gavin or Patton there is a Fuller or Liddell Hart. Had it not been for World War II (and the retirement of his arch rival, Douglas MacArthur), George Marshall might have capped his career as a colonel advising the Illinois National Guard.[42] In the final analysis, the effective implementation of change starts with the recognition that the operational commander does not train, plan, lead, and fight to ensure the success or failure of any tactic, doctrine, or weapon system. His mission is to prepare and use the Nation's military in the optimal manner to ensure the defense of vital national interests. **JFQ**

NOTES

[1] For an overview of the recurring transformation of the American military, see T.A. Heppenheimer, "Build-Down," *American Heritage,* vol. 44, no.8 (December 1993), pp. 34–46.

[2] Operational commanders lead units that conduct—and train others to conduct—operational level warfare.

[3] Relevant works include Andrew F. Krepinevich, Jr., *The Army and Vietnam* (Baltimore: The Johns Hopkins University Press, 1986); Barry R. Posen, *The Sources of Military Doctrine* (Ithaca, N.Y.: Cornell University Press, 1984); and Jack Snyder, *The Ideology of the Offensive* (Ithaca, N.Y.: Cornell University Press, 1984).

[4] Everett M. Rogers and F. Floyd Shoemaker, *Communication of Innovations: A Cross Cultural Approach* (New York: The Free Press, 1971), p. 7.

[5] Other types are optional decisions (those reached regardless of the decisions by the social system) and collective decisions (those made by consensus). See Rogers and Shoemaker, *Communication*, pp. 36–38.

[6] Rick Waddell, "The Army and Peacetime Low Intensity Conflict, 1961–1992: The Process of Peripheral and Fundamental Military Change" (unpublished paper, 1992).

[7] Rogers and Shoemaker, *Communication.*

[8] A thorough study of this period is found in Chris C. Demchak, *Military Organizations, Complex Machines: Modernization in the U.S. Armed Services* (Ithaca, N.Y.:

This article is based on a longer essay entitled "Into the Wind, Against the Tide: Change and the Operational Commander" which was cited for distinction in the 13th CJCS Strategy Essay Competition.

Cornell University Press, 1991), pp. 41–61, 164–66. Based on the author's experience in Europe, 1980–84.

[9] Eliot A. Cohen, "The Mystique of U.S. Air Power," *Foreign Affairs,* vol. 73, no. 1 (January/February 1994), pp. 114–15.

[10] Wayne Maynard, "The New American Way of War," *Military Review*, vol. 73, no. 11 (November 1993), pp. 6–8.

[11] "As any seasoned hand well knows, the crystal-clear so-called military model—give an order and get instant compliance—doesn't even hold for the military." Thomas J. Peters and Robert H. Waterman, Jr., *In Search of Excellence: Lessons from America's Best-Run Companies* (New York: Harper and Row, 1982), pp. 90–91.

[12] Norman F. Dixon, *On the Psychology of Military Incompetence* (New York: Basic Books, 1976), p. 346; Dwight D. Eisenhower, *Crusade in Europe* (Garden City, N.Y.: Doubleday, 1948), pp. 467–69.

[13] Posen, *Sources*, pp. 105–40.

[14] T.B. Buell, *The Quiet Warrior* (Annapolis: Naval Institute Press, 1987), pp. 132–66; William F. Halsey and J. Bryan III, *Admiral Halsey's Story* (New York: McGraw-Hill, 1947).

[15] Walter Lippmann, *Public Opinion* (New York: Macmillan, 1922/1960), p. 16.

[16] Roger Hilsman, *The Politics of Policy Making in Defense and Foreign Affairs: Conceptual Models and Bureaucratic Politics* (Englewood Cliffs, N.J.: Prentice-Hall, 1987), pp. 45–46.

[17] Robert Jervis, "Political Decision Making: Recent Contributions," *Political Psychology*, vol. 2, no. 2 (Summer 1980), pp. 98–100; Deborah Larson, *Origins of Containment: A Psychological Explanation* (Princeton: Princeton University Press, 1985), pp. 50–52.

[18] Larson, *Origins*.

[19] James M. Gavin, *Airborne Warfare* (Washington: Infantry Journal Press, 1947), p. 140.

[20] James M. Gavin, *On to Berlin* (New York: Bantam, 1979).

[21] Gavin, *Airborne*, pp. 140–60; see also Gavin's *War and Peace in the Space Age* (New York: Harper Brothers, 1958) and *Crisis Now* (New York: Random House, 1968).

[22] Rogers and Shoemaker, *Communication*, pp. 347–85.

[23] John Toland, *No Man's Land: 1918, The Last Year of the Great War* (New York: Ballantine Books, 1980), p. 130.

[24] Eisenhower, *Crusade*, p. 449.

[25] Gavin, *Space Age*, pp. 155–57.

[26] In addition to Weber, most other students of bureaucracy use the military as an example of this organizational type. See James Q. Wilson, *Bureaucracy: What Government Agencies Do and Why They Do It* (New York: Basic Books, 1989), pp. 3–6, 15–18.

[27] Anthony Downs, *Inside Bureaucracy* (Boston: Little, Brown, 1967), p. 174.

[28] Dixon, *Incompetence*, pp. 111–18.

[29] Irving L. Janis, *Groupthink: Psychological Studies of Policy Decisions and Fiascoes* (Boston: Houghton Mifflin, 1982), pp. 174–77.

[30] Waddell, "The Army."

[31] Dixon, *Incompetence*, p. 110.

[32] One of the few published accounts of the little chronicled "colonels' revolt" is found in David Halberstam, *The Best and the Brightest* (New York: Random House, 1972), pp. 573–79. Personal reflections by two key participants are in Maxwell D. Taylor, *Uncertain Trumpet* (New York: Harper Brothers, 1960), pp. 23–79; and Matthew B. Ridgway, *Soldier: The Memoirs of Matthew B. Ridgway* (New York: Harper and Brothers, 1956), pp. 266–73, 286–94.

[33] Dixon, *Incompetence*, pp. 112–14.

[34] Russell F. Weigley, *The American Way of War: A History of United States Military Strategy and Policy* (Bloomington: Indiana University Press, 1977), pp. 223–41.

[35] Dixon, *Incompetence*, p. 114.

[36] Robert Presthus, *The Organizational Society* (New York: St. Martin's, 1978).

[37] Posen, *Sources*, pp. 221–28; Waddell, "The Army."

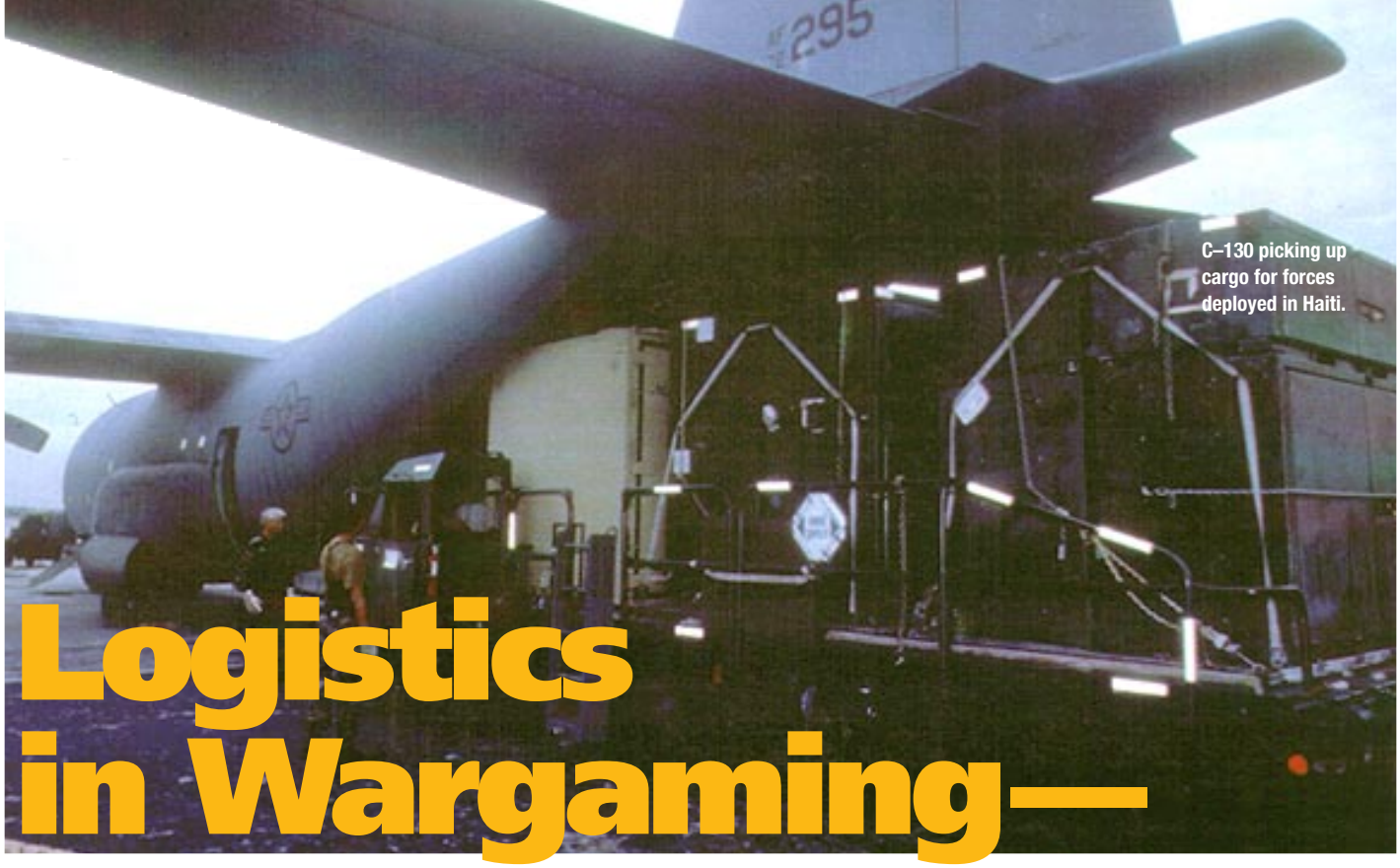
[38] Joseph I. Greene, editor, *The Infantry Journal Reader* (Garden City, N.Y.: Doubleday, 1943) includes works by Patton, Stillwell, Chennault, Marshall, and others written when they were young company and field grade officers between the wars.

[39] Halberstam, *Best and Brightest*, pp. 390–91.

[40] Dixon, *Incompetence*, p. 118.

[41] See Krepinevich, *Vietnam*, pp. 4–7.

[42] William Manchester, *American Caesar* (Boston: Litle, Brown and Company, 1978), p. 157.



C–130 picking up cargo for forces deployed in Haiti.

Combat Camera Imagery (Frank Oplanic)

Logistics in Wargaming—An Initial Report

By JOHN B. LAPLANTE, DAVID P. GARNER, *and* PATRICIA INSLEY HUTZLER

The Joint Staff has been concerned about analyzing logistics capabilities in an operational context for some time. Two recent events deepened that concern. First, the Secretary of Defense charged the Chairman with carrying out wargames to validate the two nearly simultaneous major regional conflict (MRC) strategy using the *Bottom-Up Review* update force structure. Second, he called for realistic evaluations in support of the joint warfighting capabilities assessment (JWCA) process. This led to the adoption of gaming as a means of undertaking joint assessments of critical logistics issues. Wargames are unique, low-cost ways to examine issues in an operational setting.

warfighters have come to see logistics in an operational context

Logistics analyses are often conducted without the participation of warfighters. Moreover, logistics is normally seen as an operational constraint in wargames. As a result, wargames tend to avoid focusing on how the presence—or absence—of logistic support affects campaign planning. Wargaming models largely ignore the logistic impact on operations, making it difficult to quantify specific logistic needs, support requirements for meeting those needs, and evaluate the implications of not meeting them. In most cases experts qualitatively assess possible constraints on operations.

In the past year the incorporation of logistics as an integral part of wargames has improved communication between warfighters and logisticians. The former have gained an appreciation of the critical role of logistics in operations and the latter have come to see logistics in an operational context. Now, at the conclusion of many games, the representatives of regional CINCs characterize constraints on logistics as *operational* rather than narrow *logistics* issues.

Developing a Strategy

Using wargames to assess logistics required a strategy. Global '94, a game conducted at the Naval War College, introduced us as logisticians to the joint wargaming environment and also served as the testbed for developing a strategy. Based on wargames in the last year, this strategy

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Joint Staff to assess near- and mid-term capabilities to win two nearly simultaneous MRCs against forecasted threats. The game illustrated the benefits of pre-game coordination between the Joint Staff and services. It was a watershed for understanding both the capabilities and limitations of theater-level campaign analysis, especially logistics assessments. Nimble Dancer '95 indicated the direction that modeling must take to integrate logistics in theater-level analyses and highlighted strategic mobility, adequacy of support forces, and the apportionment of preferred munitions.

Naval Ordnance Game (ORDWAR)—This game was the first to focus on ordnance as well as related logistics issues. Co-sponsored by the Navy and Marine Corps, ORDWAR assessed one MRC set in 1995 and then expanded to a two-MRC scenario. In addition to combat consumption, it addressed outload, transportation, industrial base, maintenance, and regeneration of ordnance, as well as command and control. ORDWAR also stressed entwining Navy and Marine requirements and capabilities with those of the other services, for example, using common facilities for in-theater reception and onward movement of munitions. The requirement for greater participation by the munitions community in TPFDD development was one of the major outcomes.

Naval Total Force '94 (TF–94)—This game focused on readiness, availability, adequacy, and accessibility of the Reserve, and the capabilities of the naval force structure to meet two-MRC requirements. TF–94 sought to develop a model for Selected Reserve readiness categories based on expected call-up times, address the Secretary of the Navy's Naval Reserve issues, review roles and missions, and play the Naval Reserve master mobilization plan. A major accomplishment of TF–94 was developing a means for categorizing Reserve units to flag activation requirements and designate unit readiness goals. Moreover, it expanded the definition of enabling forces to include deploying forces with responsibilities other than for movement and reception of forces.

Cobra being loaded aboard *USS Capella* after Desert Storm.

U.S. Army (Robert Reeve)

***USS Tripoli* being refueled by *USS Sacramento* off Somalia.**

Combat Camera Imagery (Jeff Brady)

instances where the models support logistics issues—such as munitions consumption—the operative assumptions and variables inherent in the model are not apparent. Thus, model results require careful analysis and interpretation to furnish meaningful support in games. Professional judgment by subject area experts provides the critical qualitative assessments needed to complement model results.

Data requirements and turnaround time often limit models in gaming. Many models used in campaign analysis are resource-intensive, requiring extensive preparation for each run. Moreover, they can provide details on the conduct of campaigns. These characteristics emphasize pre-game modeling runs and severely restrict excursions in real games. But improvements have been made and, as a result, models for Global '95 supported two moves a day. Nonetheless, much remains to be done on model development to increase the value gained for logisticians from gaming.

Variations among wargames limit the ability to replicate results. Each addresses particular concerns. They are expensive, so duplication must be managed. Varied timeframes, objectives, and organization contribute to their unique character. In addition, the dynamic nature of wargames where players influence the conduct of a campaign limit the ability to compare the results of games. From an assessment perspective, we must treat each match as an individual data point rather than as providing a complete answer. However, a string of similar data points results in a trend; and soon a possible impact of an issue on operations becomes clearer, as does the likely solution.

A recurring problem has been a lack of synchronization among wargames. As mentioned, varied timeframes, objectives, and purposes make it difficult to achieve consistent results, although a greater harmonization is being realized. Recently, the scenario of two nearly simultaneous MRCs has become the standard gaming scenario, with excursions done primarily with regard to location, size, and timing of associated OOTWs. Last year the naval series as well as Global '95 were set in 2003. Each iteration of a standard scenario contributes to our understanding of logistics problems.

Joint participation varies. We are at the embryonic stage in assessing logistics issues from a joint perspective. Many issues are analyzed using a stovepipe approach. Linkages among issues are not clearly identified. Joint requirements are not solidly established and complementary service capabilities are not being maximized. Nonetheless, we are aware of these shortfalls. In an era of dwindling resources, a combined, integrated effort is necessary to support the warfighter.

Keys to Success

One major lesson has been to identify, describe, and analyze issues before a game, and to do it early. Because it is imperative that CINCs, services, and Joint Staff fully participate, new management tools have been developed. Central among them is the joint monthly readiness review to identify logistics readiness concerns of CINCs and examine service budgets and FYDP issues.

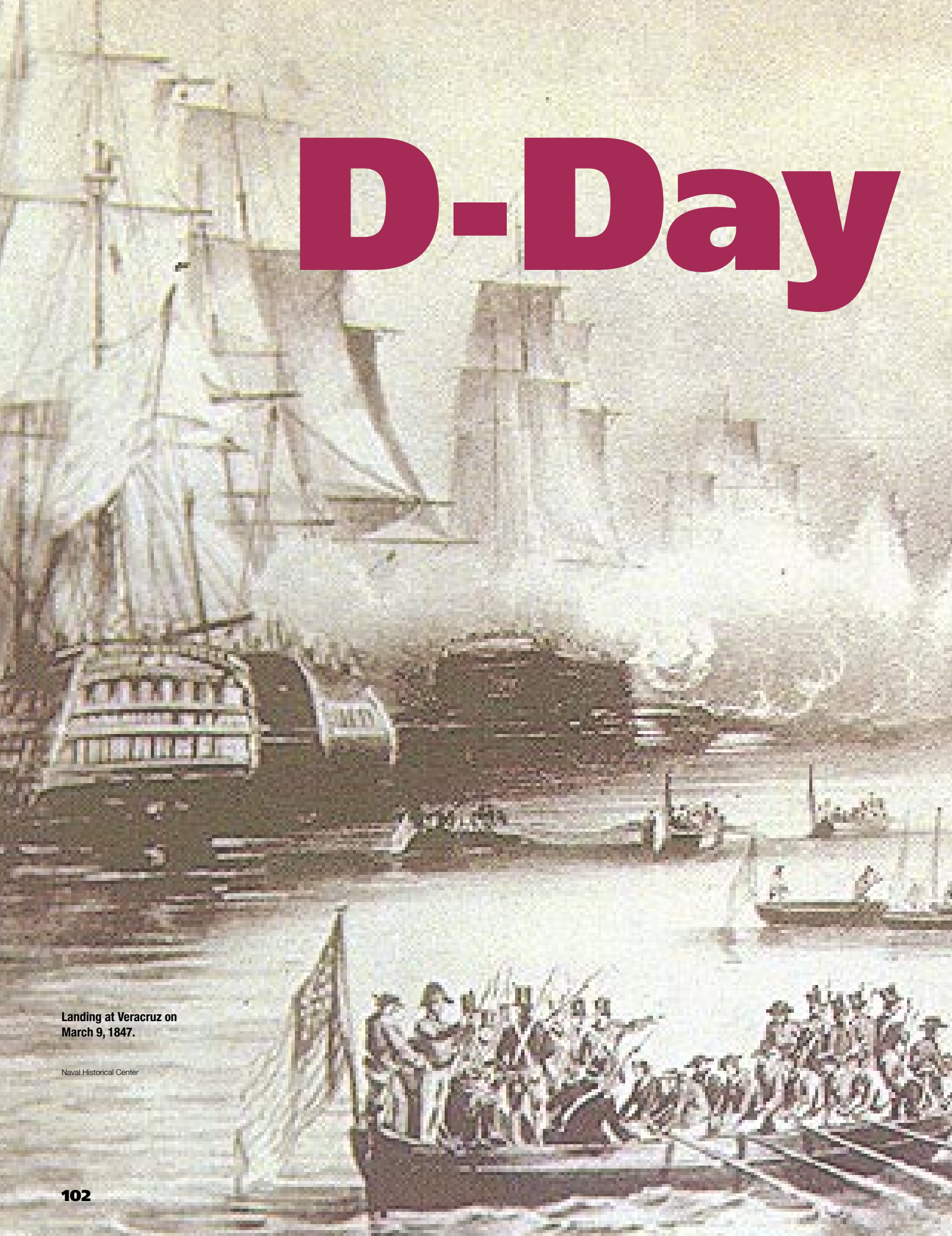
Include joint and coalition support issues. Wargaming can increase knowledge of common sourcing and employment of logistics as a force multiplier. This requires an expanded use of joint logistics capabilities. Moreover, it means considering the logistics impact on coalition partners in terms of requirements and potential support. This is important in depicting implications of host nation support in games. An improved means of analyzing joint and coalition requirements is needed.

Involve general and flag officers. To focus staff performance, especially in the pre-game phase, continuous participation by senior leaders is critical. Flag-officer IPRs, as conducted in the Naval Logistics Game, are very effective. While this process requires a considerable investment of time, the benefits of flag officer involvement have been demonstrated. At a minimum, periodic flag-level briefings are needed to apprise senior leaders of the relevant issues and their status.

Develop effective logistics models and data bases. The weakness in gaming—particularly logistics—is modeling and simulation. Models and data bases that produce quantifiable results at useful levels of detail are key to improving consideration of logistics in campaign-level analysis. Many defense analysts are currently embarked on ambitious efforts to develop the next generation of joint campaign-level models. Representing logistics impacts will be part of this capability.

The success of wargaming logistics has influenced the Chairman's Program Assessment by working through logistic operational issues in a scenario-based assessment. It has also significantly improved dialogue among joint logisticians, developed a process for including logistics issues in wargames, and expanded attention to such issues through new management mechanisms. Although gaming has genuine limitations, it offers valuable insights to the joint logistics and operations communities. We have a sound basis on which to build relationships that will continue to grow. JFQ

D-Day

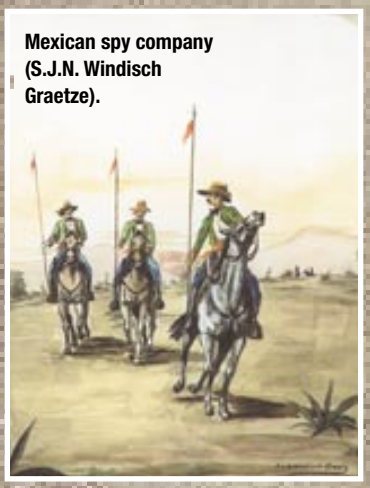


Landing at Veracruz on March 9, 1847.

Naval Historical Center

Veracruz, 1847–
A Grand Design

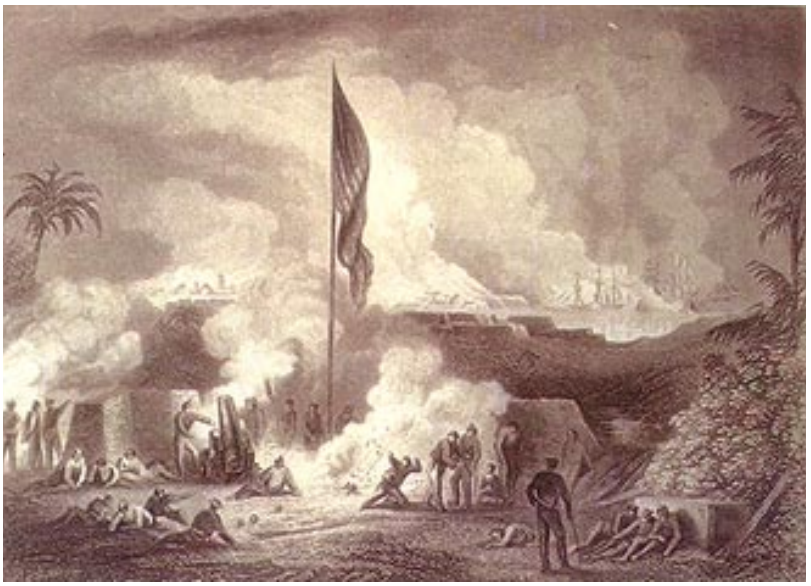
By PAUL C. CLARK, JR., *and* EDWARD H. MOSELEY



Mexican spy company (S.J.N. Windisch Graetze).

NDU Library Special Collections

In his last message to Congress, delivered on December 5, 1848, President James K. Polk described the magnificent efforts that had led to victory in the war with Mexico. He praised those civilians who had directed the military in "a vast extent of territory, hundreds and even thousands of miles apart from each other." He took special pride in the cooperative efforts of the Army and Navy: "Both branches of the service performed their whole duty to the country. . . . There was concert between the heads of the two arms of the service. . . . By this means their combined power was brought to bear successfully on the enemy."[1]



Naval Historical Center

Night battle at Veracruz.

Behind Polk's idealistic and laudatory statement was a much more complex and somewhat sordid reality. The development of national strategy during his administration was often marred by personal and political struggles, competition among officials with large egos, and a jealous chief executive insecure in his own strategic thinking and overly concerned with tactical details better left to his subordinates. A prolonged debate about the expansion of slavery blocked a major military appropriations bill in Autumn 1846, delaying critical supplies to the Army in the field. Suspicion and intrigue poisoned relations between the President and his two senior Army commanders, and at times between those officers. Despite such difficulties—and petty bickering—Polk was justified in feeling a sense of accomplishment for historic victories. In citing the close cooperation between the Army and Navy, he highlighted jointness as a significant dimension of the U.S. achievement. And one of the war's most successful joint operations was the landing at Veracruz.

To place this operation in context, it is important to note that there were numerous incidents of interservice cooperation during the Mexican War. It was evident in far-flung actions along the California coast, where sailors under Commodore Robert F. Stockton fought bravely on land to rescue a small, ill-equipped Army force under General Stephen Kearny. General Zachary Taylor's campaign in northern Mexico was highly dependent upon a supply line across the Gulf of Mexico and up the Rio Grande, kept open by the Navy. In May 1846, the Navy landed 500 sailors and marines to reinforce Taylor at Fort Polk on the Brazos Santiago when "Old Rough and Ready" was fighting the first major battle of the war a few miles away at Palo Alto.[2]

Most significant, however, was the landing and siege of Veracruz, a joint operation which took place March 9–27, 1847. That landing, largely unknown to all but students of the Mexican War, was the first major amphibious operation in American history and the largest one conducted until the North African campaign in 1942.

The War's Background

In a war message to Congress in April 1846, Polk charged Mexico with aggression against U.S. territory. He stressed the defensive nature of American military operations in the first weeks after Congress declared war. In keeping with that, naval forces established a blockade from the mouth of the Rio Grande to the Yucatan Peninsula and along the Pacific coast of Mexico. It soon became clear, however, that the President had much broader objectives. In answering the call of Manifest Destiny, he was committed to a strategy that would expand the Nation into New Mexico and California. To accomplish this, he decided on an aggressive campaign that took U.S. ground forces from the southwest borderlands deep into the Mexican interior.[3]

From May to September 1846, Zachary Taylor won a series of hard fought battles in Texas and Northern Mexico. Despite these Mexican defeats, it became apparent that the occupation of Mexico's northern provinces would not force that government to agree on a settlement acceptable in Washington. Polk held preliminary cabinet meetings in June 1846 about a new strategy calling for a second front along Mexico's east coast. In anticipation of this action, Secretary of the Navy George Bancroft directed the commander of the Home Squadron, Commodore David Conner, to furnish information on defenses at Mexican gulf ports, especially Tampico and Veracruz (including the latter's fortress, San Juan de Ulúa), and on routes from the coast inland to Mexico City.[4]

Conner considered the smaller port of Tampico useful as a staging base for an operation against Veracruz. The latter was the more important location because it gave access to the *Camino Nacional* (national road) to Mexico City. In his reports, Conner outlined a strategy for ground and naval forces to reduce Veracruz by investing it from the rear. Besides recommending Tampico as a staging base for U.S. forces en route to Veracruz,

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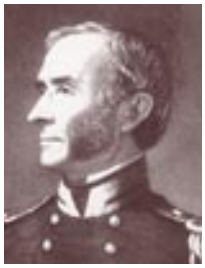
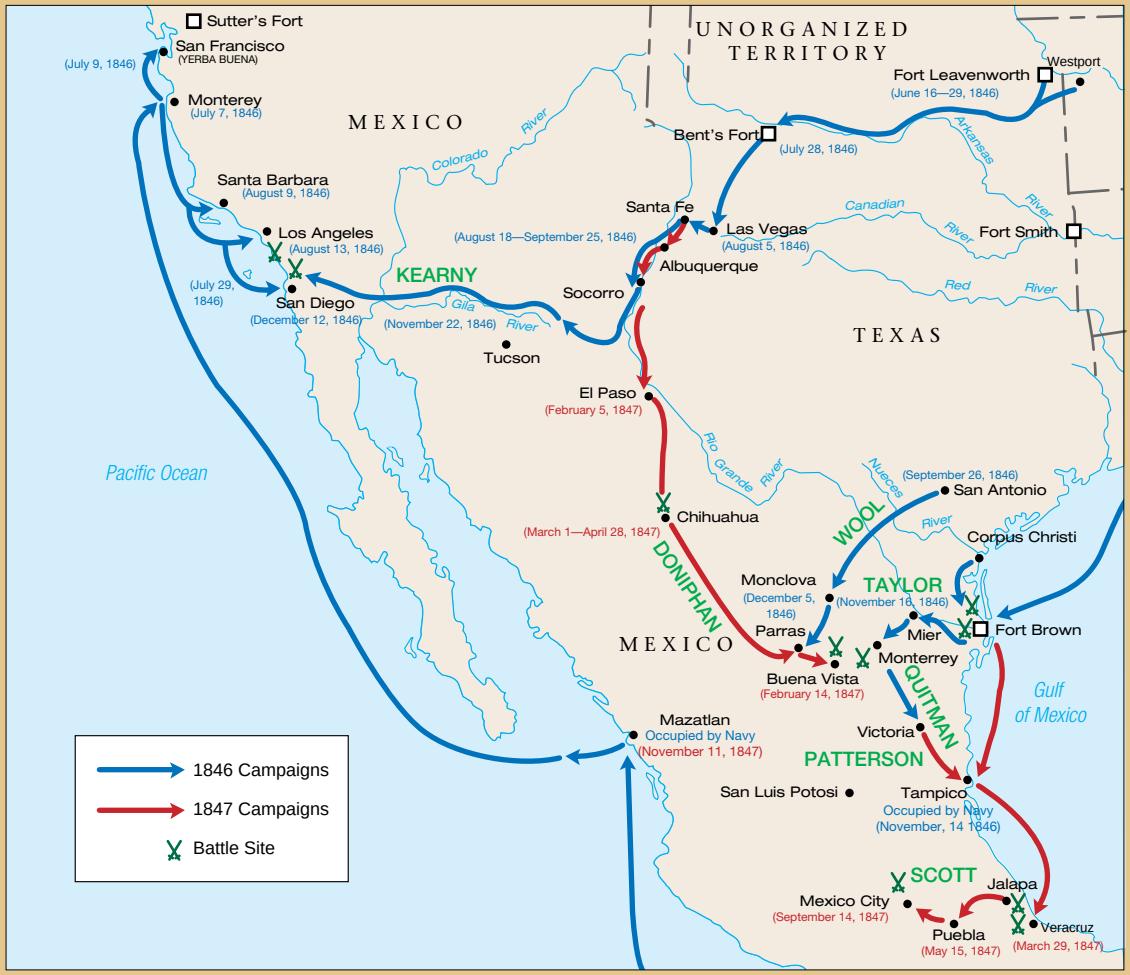


Naval Historical Center

Commodore David Conner.

Mexican War: Theater of Operations, 1846–47



Sources: The West Point Atlas of American Wars (New York: Praeger, 1959); Adrian George Traas, *From the Golden Gate to Mexico City: The U.S. Army Topographical Engineers in the Mexican War, 1846–1848* (Washington: Government Printing Office, 1993).

he recommended Antón Lizardo, an anchorage ten miles below Veracruz, as a safe roadstead for a rendezvous prior to an amphibious assault. Finally, Commodore Conner cautioned that a direct naval assault against San Juan de Ulúa would be an extremely high-risk operation.[5]

In August Polk first broached the idea of a major operation at Veracruz to the cabinet, and for the next three months, during numerous discussions with his staff, he discussed the notion of an amphibious landing. Though reports from the theater were usually a month old, the President demonstrated a zeal and tenacity regarding both strategic and operational issues and demanded that he be informed of practically every detail. Strangely, Polk did not include the Nation's top military officers in these sessions. It became clear that he had every intent of being his own chief of staff and would use cabinet members, especially Secretary of War William Marcy and Secretary of the Navy Bancroft (who was replaced by John Mason in September 1846) as a kind of "operational plans" division. The War Department, which was larger than the Navy Department, had virtually no staff to support planning, and consisted of only nine clerks, two messengers, and a handyman. The President's decision to take matters of strategy into his own hands, despite a lack of military experience, was partially motivated by distrust of the senior Army commander, the general in chief Winfield Scott. Polk claimed that Scott's actions and attitude were "recklessly vindictive" toward his administration, and doubted him because he was an outspoken Whig. In fact, Polk's relations with senior officers reflected his

insecurity about military strategy, an uncertainty made worse by jealousy. He was equally suspicious and contemptuous of the other top officer, General Zachary Taylor, another Whig sympathizer.[6]

Polk continued his strategy sessions into Autumn 1846. When he decided on October 20 to have Taylor go on the defensive in northern Mexico, it appeared that he was moving cautiously toward some type of an operation along the gulf coast. His private statements and diary entries, however, indicated that he was uncertain about the course of the war and feared the political costs of enlarging it.

Veracruz and Its Castle

Although Scott was still out of favor with Polk and had not been invited to participate in the deliberations, Marcy kept the general in chief informed. Scott, sensing that a final decision on the expedition was near, maneuvered for command of the Veracruz operation.[7] He prepared plans that outlined his views on seizing the port and on a subsequent march on Mexico City. In late October, he forwarded a written proposal to Marcy entitled "Veracruz and Its Castle." Two weeks later he revised this study to reflect an expanded campaign into the heartland of Mexico.[8]

Scott's strategy was based on Jominian principles of war

Scott's strategy for the seizure of Veracruz and follow-on thrust into the interior was surely influenced by Conner's reports. It was also based on Jominian principles of war. Realizing that the war was controversial and that public opinion was dangerously divided, he understood that war policy would not be an unqualified extension of political will. Resources would be limited; the Nation would only partially mobilize to support a campaign. His strategy included blockades and sieges, employed deception and diplomacy when possible, and substituted maneuver for superior numbers and combat. Following Jomini, Scott recognized the inherent dangers of an amphibious invasion of a foreign land and the imperative to seize a fortified harbor through which to invade—or to retreat if necessary—and to secure a beachhead where a large force could be disembarked. His plan recognized the need to introduce artillery early to support the landing. Scott called for an invasion early in 1847 since a delay beyond then would risk mounting the operation in an unhealthy season of the year along the coast where the dreaded *vómito negro* (yellow fever) could strike his troops.[9]

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Naval bombardment of Veracruz (lithograph by N. Currier).

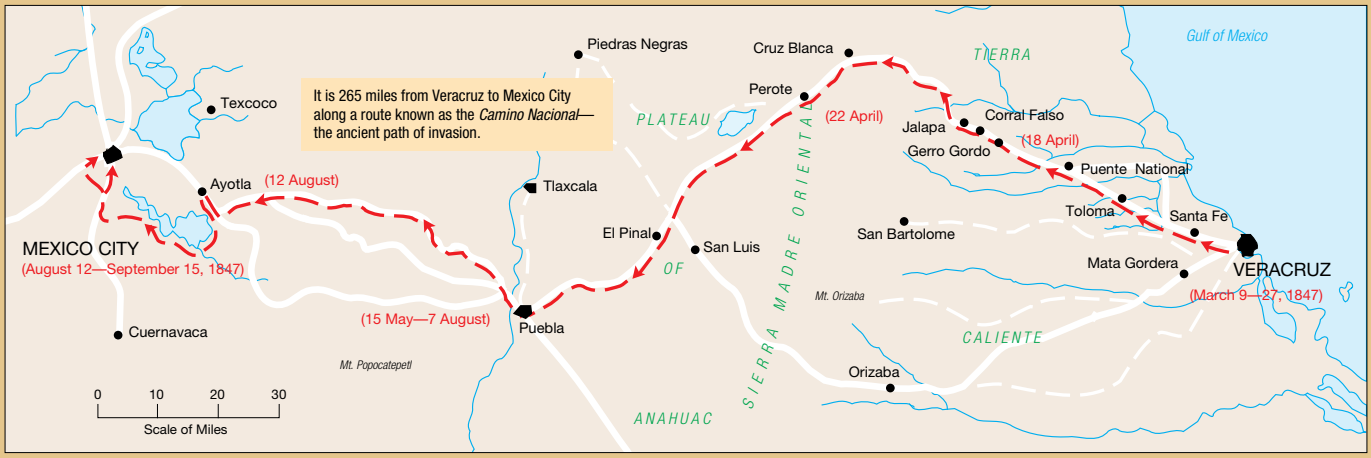
A Second Front

The President agonized over approval for the expedition. The conflict was at a stalemate. Taylor had won great victories on the northern battlefields, but strategically they had little meaning. Polk feared a public backlash if the war were greatly expanded. He began to speak of going on the defensive, even writing into a draft of his annual message to Congress a passage which called for a policy of "inactive occupation" of territory already conquered. A great frustration was beginning to set in among members of his administration and Congress. Daniel Webster remarked that "Mexico is an ugly enemy, she will not fight—and will not treat." Yet Polk knew that Veracruz meant a full-scale campaign into the heart of a foreign land, that it would transform the conflict into a war of conquest and subjugation, and that many Americans were opposed to their Army occupying the capital of another nation.[10]

At this point of indecision, the President came under the persuasion of his friend and fellow Democrat (and favorite military advisor), the influential Senator Thomas Hart Benton of Missouri. Benton met with Polk almost daily in this period and they frequently discussed the war. Although initially against involvement, the senator was now a war hawk. Benton opposed Polk's inclination to revert to the defensive, contending that it would only "prolong the war and ruin the Democratic Party." He argued for an aggressive strategy that called for a bold strike against Veracruz followed by a "rapid crushing movement" against Mexico City. The President, at last convinced, announced his approval of the Veracruz expedition to the cabinet.[11]

Polk now had to pick a commander for the new theater. Realizing the commanding general could become a national hero and thus a political challenge, Polk wanted a Democratic ally, while the two senior men in uniform, Taylor and Scott, were Whigs. He discussed the command issue with Benton who readily concurred with the partisan opinion that Taylor was "a brave officer but not a man of capacity enough for such a command."[12] When Polk raised Scott's name, the senator replied that he had no confidence in him, a view that must have pleased the President. Benton then suggested that the President ask Congress to create the grade of general of the Army, a rank above that of both Taylor and Scott, the

After Veracruz: Scott's Six-Month March on Mexico City



Source: The West Point Atlas of American Wars (New York: Praeger, 1959).

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Secretary of the Navy George Bancroft.

Army's general in chief. The officer holding this rank could then be given command of the new Army. The great Missouri senator, never accused of modesty, then suggested that he was willing to accept the command himself. Polk, revealing a tendency to place politics first—and showing his innocence of military affairs—enthusiastically backed the idea and immediately lobbied Congress for support. After briefly attempting a political coup (the House of Representatives favored the idea), Polk was convinced of its futility by his friends in the Senate. He then turned again to Scott, the logical choice and Marcy's recommendation. Secretary of State Buchanan, Secretary Mason, and the remainder of the cabinet—even Senator Benton—eventually fell in line to support the general in chief who was the author of the plan to open a second front that the administration had already agreed upon. Winfield Scott could now pursue his grand design.[13]

Scott and Joint Warfare

The mission was only generally defined by Scott's command authorities. Marcy indicated that Polk had ordered him to "repair to Mexico, to take command of the forces there assembled, and particularly to organize and to set afoot an expedition to operate on the gulf coast." He assured Scott of the full support of the administration and promised no interference from either himself or the President on operational questions. Some have argued that the mission was purposely broad to ensure that if "grief came to the expedition the blame would rest on Scott's Whig shoulders."[14]

Scott took full advantage of the broad mission statement. Before arriving in the gulf, he communicated with Conner, requesting details on staging areas, anchorages, defenses at Veracruz, Mexican troop strengths, potential landing beaches, and roads to the interior. Conner, echoing his earlier report to Bancroft, recommended that Scott use Tampico, 200 miles north of Veracruz, as an intermediate staging area for ground and naval units, and that Antón Lizardo serve as a final safe anchorage and rendezvous point prior to the assault. Much of Conner's information in this period was the basis of Scott's operational plan for the landing. Scott also wrote to Taylor at Monterrey, informing him that he would have to stay on the defensive and furnish most of his regulars for this expedition. Some troops in forward positions around Monterrey would go overland to Tampico; units still in Taylor's rear area on the border would rendezvous at the Brazos Santiago (referred to as "the Brazos"), north of the mouth of the Rio Grande on off-shore islands along the gulf coast. Drawing off Taylor's best troops embittered the old soldier, causing a permanent rift with Scott.[15]

Scott's demand for sea transport and naval support was both large and unique for that era. For the largest amphibious assault in American history, he requested 50 ships of 500 to 750 tons each to lift approximately 15,000 men and a large siege train to the area of operations.[16] These transports would be sail as well as steam-powered and under Army command. Since amphibious operations of this type and scale were unprecedented, the landing craft did not exist. Scott wanted small assault boats to put his troops ashore and gave

the requirement to his resourceful logistician, Army quartermaster general Thomas S. Jesup. These surfboats were the first specially constructed for an American amphibious assault. Scott's specifications called for flat-bottomed, double-ended, broad-beamed rowboats; and 141 were ordered at $795 each. They would carry a platoon of forty men plus a crew of eight sailors, with a naval officer in command. The contract was negotiated with a Philadelphia builder by Jesup's agent, Captain Robert F. Loper of the Army, but the boats were designed by a naval officer, Lieutenant George M. Totten.[17]

Scott's demand for naval support was unique for that era

When Scott departed Washington for the Brazos on November 26, 1846, he planned to have his entire force afloat in gulf waters by February 1 at the latest. In New York, he engaged the diplomat Francis Dimond to go to Cuba to recruit two intelligence agents to operate inside Mexico. Continuing from New York on the 30th, head winds and rough seas in the gulf delayed his arrival in New Orleans until December 19, where he dined with Henry Clay. The venerable old statesman and orator, who opposed an aggressive policy toward Mexico as a presidential candidate two years before, would lose a son, Lieutenant Colonel Henry Clay, Jr., at Buena Vista within two months. While in the Crescent City, Scott was also advised by shipmasters that Lobos Island, a sandy coral formation between Tampico and Veracruz, offered safe anchorage and a good rendezvous location. Due to limited space in the Tampico anchorage, Scott chose Lobos and sent a message from New Orleans advising all forces to rendezvous there before continuing to Antón Lizardo.

Scott then moved on to the Rio Grande, hoping to discuss the exact breakout of forces for the new campaign with Taylor. But Taylor was in no mood to converse with the general in chief and failed to appear, so Scott decided which units to take along. The troops were ordered to gather at the Brazos for movement to Lobos Island. Concerned about undercutting Taylor's command authority, Scott was careful to send him copies of all movement orders. He discovered that many of Taylor's units had not arrived at the Rio Grande, and that Jesup, whose headquarters had been moved to the Brazos, was having trouble getting the transports and accompanying trains (including surfboats) from the east coast. Scott became increasingly concerned that he would not meet the February 1 launch date for the invasion. In an attempt to "summon an army," he remained at the Brazos during January 1847. While there, he communicated again with Conner, who confirmed that Lobos Island would be an appropriate rendezvous point. Restless with inactivity and agitated by the laborious process of gathering troops and supplies, Scott—now resigned that his target date would slip—left Brigadier William Worth to complete the embarkation at the Brazos and departed for Tampico in the middle of February.

Scott found some 6,000 soldiers at Tampico on February 19 waiting for transportation to Veracruz. Reaching the port city was a triumph for Scott. He was greeted in grand style ashore by the strains of the Army band from Governor's Island. Many senior officers who had been fighting with Taylor were there to greet him. After conferring overnight, Scott steamed south and arrived at Lobos Island, now the main rendezvous for the Army, on February 21.

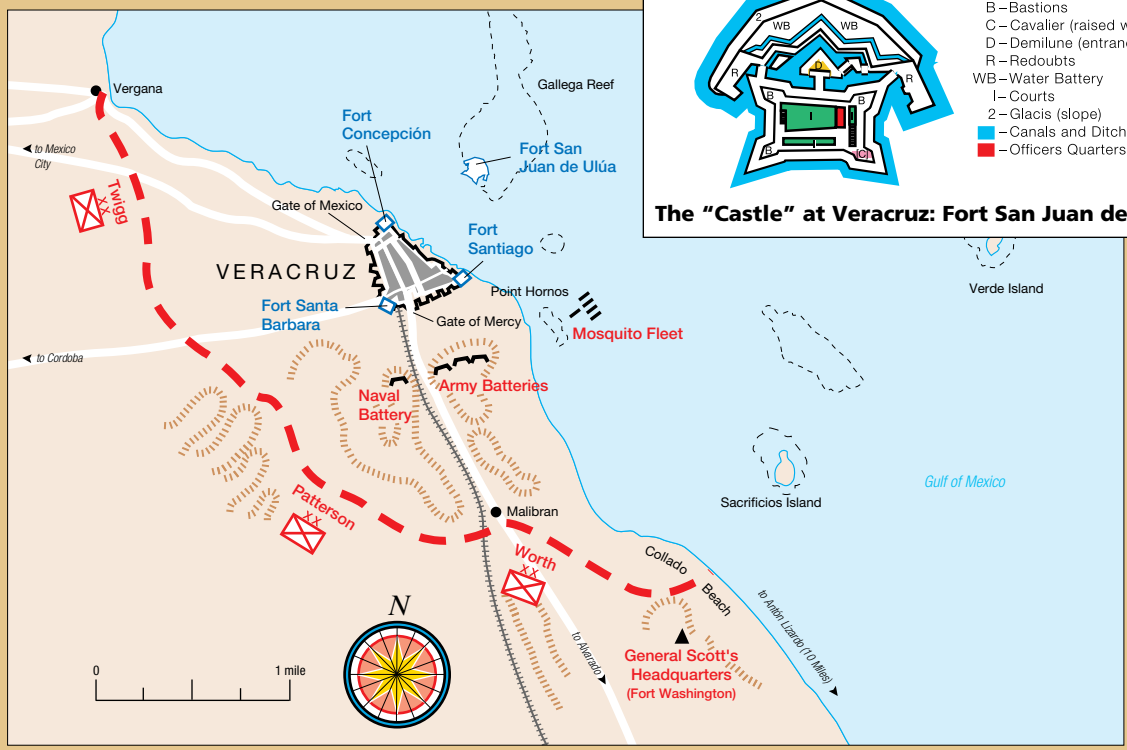
Scott spent a week at Lobos drilling available troops and waiting impatiently for the rest of his force. Good winds finally came, bringing most of the regiments under General Worth, along with a few units from Tampico and troops directly from home "coming down before the gale like race horses." The roadstead at Lobos Island became, in the words of one soldier, "a wilderness of spars and rigging." Although all his troops had not arrived, the restless Scott, fearing the approach of the yellow fever season, decided to go with the forces on hand. On March 3 the commanding general departed, his blue flag flying from the maintruck of *USS Massachusetts*. Always a man of spectacle and drama, the imposing six-foot-five Scott stood bareheaded on the deck of his flagship. As it moved among the transports, he acknowledged the shouts from his men. Morale was high; troops cheered their general, and sailors sang:

> *We are now bound for the shores of Mexico*
> *And there Uncle Sam's soldiers we will land, hi, oh!*

The fleet stood away. Winfield Scott and his army were off to Veracruz.[18]

Driven by fair winds, the armada arrived March 5. Commodore Conner sent a ship under Captain John Aulick to an offshore island, Isla Verde, to meet the fleet and guide it through the shoals to Antón Lizardo. The next day—Sunday, March 6—Conner arranged for a reconnaissance of the landing site by Scott and his principal commanders and staff, who left at 0900 on the small steamer *Petrita*. Aboard were Scott's three division commanders and all the officers he called his "little cabinet." This group essentially acted as a general staff and was made up of Army officers. Among them were Lieutenant Colonel Ethan Allen Hitchcock, the inspector general; Scott's son-in-law, Captain Henry Lee Scott (who

The Investment of Veracruz, March 9—27, 1847



The "Castle" at Veracruz: Fort San Juan de Ulúa

Sources: K. Jack Bauer, *Surfboats and Horse Marines: U.S. Naval Operations in the Mexican War, 1846–48* (Annapolis: U.S. Naval Institute, 1969); *West Point Atlas of American Wars* (New York: Praeger, 1959).

acted as staff coordinator); the chief engineer, Colonel Joseph Totten; and five engineers: Major John L. Smith, Captains Robert E. Lee and Joseph E. Johnston, First Lieutenant P.G.T. Beauregard, and Second Lieutenant Zebulon B. Tower. Conner showed Scott a potential landing site. Known as Collado Beach, it lay behind Sacrificios Island, two and a half miles below Veracruz. It was a slightly curving stretch of beach with a gentle slope. The site, just beyond the range of the guns of the city and fort, was an excellent choice.[19] As

the plan was simple compared to modern amphibious operations

Petrita turned in front of the fortress San Juan—at a distance of less than a mile—Mexican batteries opened fire and bracketed the ship. Ten rounds exploded beyond, short of, and over the command group, but none struck the little steamer, and it returned safely to Antón Lizardo.[20]

Scott and Conner used Monday, March 7, to organize the forces in loading units. The plan was simple compared to modern amphibious operations. Scott had apparently first thought of the landing as an all-Army effort—with troops simply moving from Army transports to surfboats and assaulting the beach. But Conner argued that the roadstead between Collado Beach and Sacrificios Island was too limited to hold all the Army transports and that it would be more effective to move most of the assault force from Antón Lizardo in large Navy ships. Scott agreed. Army transports were put temporarily under the command of Conner who was given authority to organize loading on Salmedina Island—adjacent to Antón Lizardo—and carry out ship-to-shore movement. Scott planned to hit the beach in three waves: Worth's division of regulars would go in first, with Major General Robert Patterson's volunteers following, and Brigadier General David Twigg's regulars landing last. On the evening of the 7th, Scott announced the landing would take place the next day.

On the 8th, the weather broke stormy. Scott, fearing a "norther," the dreaded gulf storm of the winter season, postponed the landing a day. On

the 9th, Scott later recalled, "the precise day when I had been thirty years a general officer—the sun dawned propitiously on the expedition." Another officer present observed, "If we had the choice of weather, we could not have selected a more propitious day. The sun shot forth his brilliant rays in a cloudless sky. . . ." The first real D-Day in American history had arrived. At Salmedina, boat crews under Captain French Forrest launched surfboats from designated positions on the beach and used them to move the troops from Army transports to naval vessels. The largest ships, the frigates *USS Raritan* and *USS Potomac*, each loaded 2,500 men; the smaller ships, such as the sloops *Albany* and *St. Mary's*, each loaded about 1,000 men; and other still smaller vessels loaded fewer men. Ten Navy sailing ships, four Navy steamers, and five Army steamers were used for the move from Salmedina to Sacrificios.[21]

Discarding signals which had been prepared for an all-Army operation, Scott and Conner worked out a set for supporting fires, loading surfboats, and assaulting the beach. The movement took most of the day. At 1530 hours, Scott hoisted red, yellow, and red-and-white flags from the mainmast of *USS Massachusetts*, a preparatory signal for Worth's division to reload the surfboats. After some initial confusion, Worth pulled them abreast behind *Princeton,* anchored about 400 yards off shore. As *Potomac* moved behind Sacrificios its band struck up "Yankee Doodle," "Hail Columbia," and "The Star Spangled Banner." At this time Mexican cavalry were spotted on hills behind the beach. Although the enemy disappeared when the schooner *Tampico* fired one volley in its direction, anxiety rose as the assault troops expected opposition on landing. At 1730 the troops cheered as Scott fired a gun and raised a fourth flag to his mast. It signalled the first wave: assault the shore! It was a moment of great tension and excitement since no one knew what lay beyond the beach. In minutes a gig sped out from the left side of the line of boats and an officer jumped waist-high into the surf, general's gold braid reflecting the bright sun. The gallant William Worth was leading the 6th Infantry Regiment ashore.[22]

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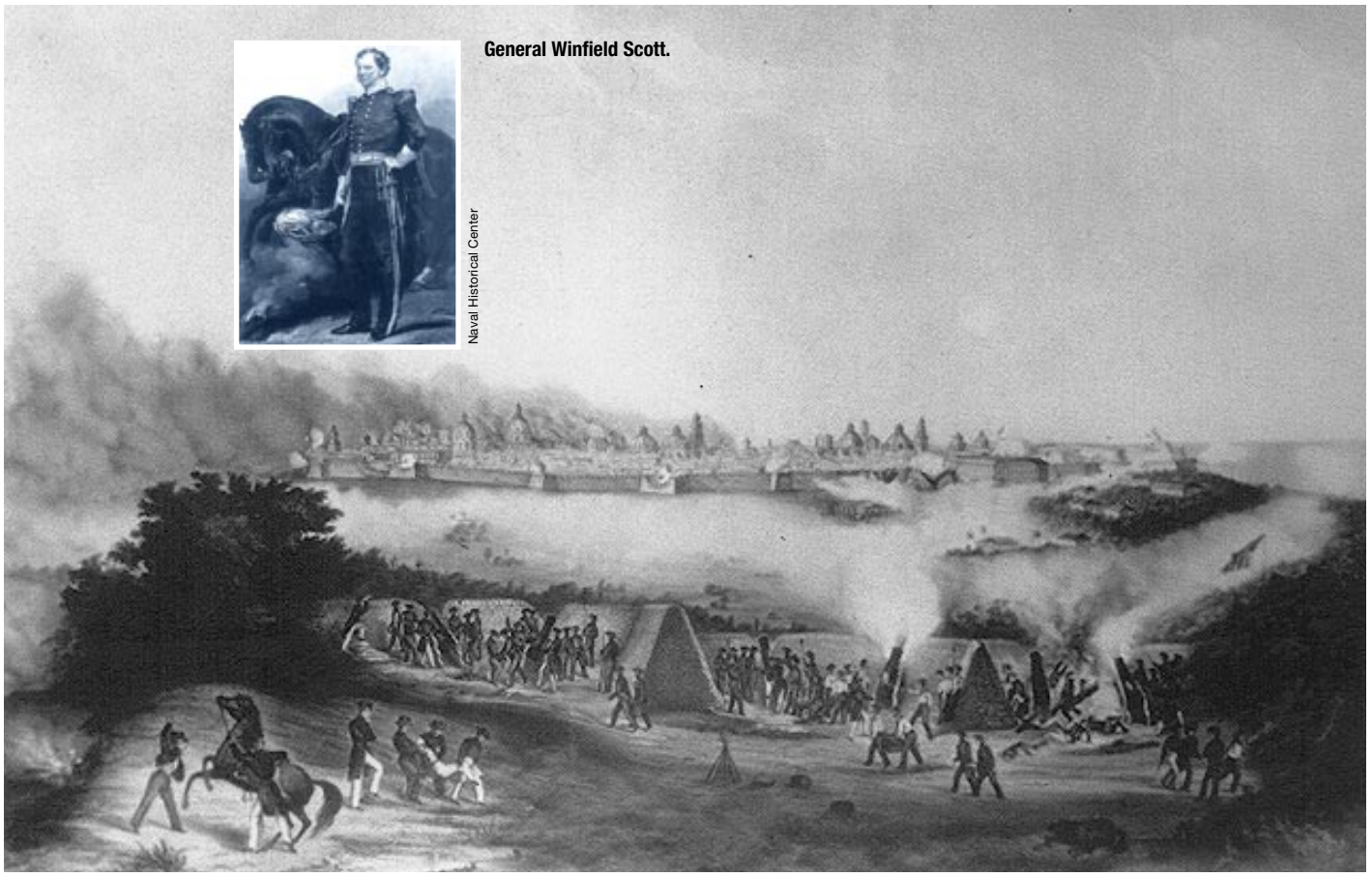
Commodore Matthew C. Perry (portrait by John Beaufain Irving, Jr.).

To Worth's surprise, his division landed essentially unopposed—there was only sporadic fire from San Juan de Ulúa—and the remaining two assault waves came ashore by 2200 hours. By midnight Conner had landed 10,000 men without one life lost. Over the next few days, under intermittent harassing fire from Mexican batteries and occasional fire from cavalry patrols behind the sandhills, Scott established his headquarters ashore (naming the encampment Fort Washington) and began subduing the city and fort. This required a large supply build-up on Collado Beach and troop deployments over difficult terrain to invest Veracruz, efforts delayed by "northers" over the next two weeks. Unloading supplies, however, continued at Collado. To distract the Mexicans during the troop movement, Conner sent Commander Josiah Tattnall with *Spitfire* close in to the shore to fire on San Juan de Ulúa on March 10. The bombardment did little damage but allowed Patterson to pass through Worth's troops and position his division to the west. Within two days, Scott had most of his 12,000-man army—including a Marine company in the assault phase, soon augmented by a 400-man battalion—on Mexican soil.

The formation consisted of Worth's division deployed from Collado Beach southeast of the city, west and northwest to a position at about seven o'clock. Patterson's volunteers occupied roughly the center of the half moon encirclement on the west. Twigg's regulars, passing through Patterson's division, completed the investment on March 13 when they closed on the village of Vergana at the entrance to the national road on the coast north of Veracruz. The line of investment ran about seven miles from shore to shore.

From reconnaissance on horse the first day, Scott realized that his plan to reduce the city through siege would take patience. Conner's earlier reports had convinced him that Veracruz and San Juan were formidable and strongly defended. He understood there were 3,000 well-supplied troops (including 1,000 militia) in the city of 15,000. The city was encircled by a 15-foot curtain wall with redans and nine forts. The defenders set thick clusters of prickly pear in front of the wall and dug a line of *trous de loup*, conical holes with sharpened stakes to impale anyone who stepped on them. On the seaward side loomed the fortress of San Juan de Ulúa, solidly constructed on the submerged Gallega Reef. It was, and remains today, an awesome structure. Mounted along and within its walls were over 100 cannons and 1,000 men. Scott noted that in March 1847 the fort "had the capacity to sink the entire American Navy."[23]

During the first week on shore some of Scott's officers questioned his siege strategy and wanted to take Veracruz by infantry assault. The general called a meeting in his tent and argued that an assault would be "an immense slaughter to both sides, including noncombatants—Mexican men, women, and children." Besides, he claimed, such an assault could mean the loss of 2,000 to 3,000 of "our best men . . . and I have received but half the numbers promised me." How, Scott contended, "could we hope to penetrate the



General Winfield Scott.

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Perry's heavy guns, March 24 and 25 (painting by Lieutenant Henry A. Walke, USN, from drawing on stone by Pfau).

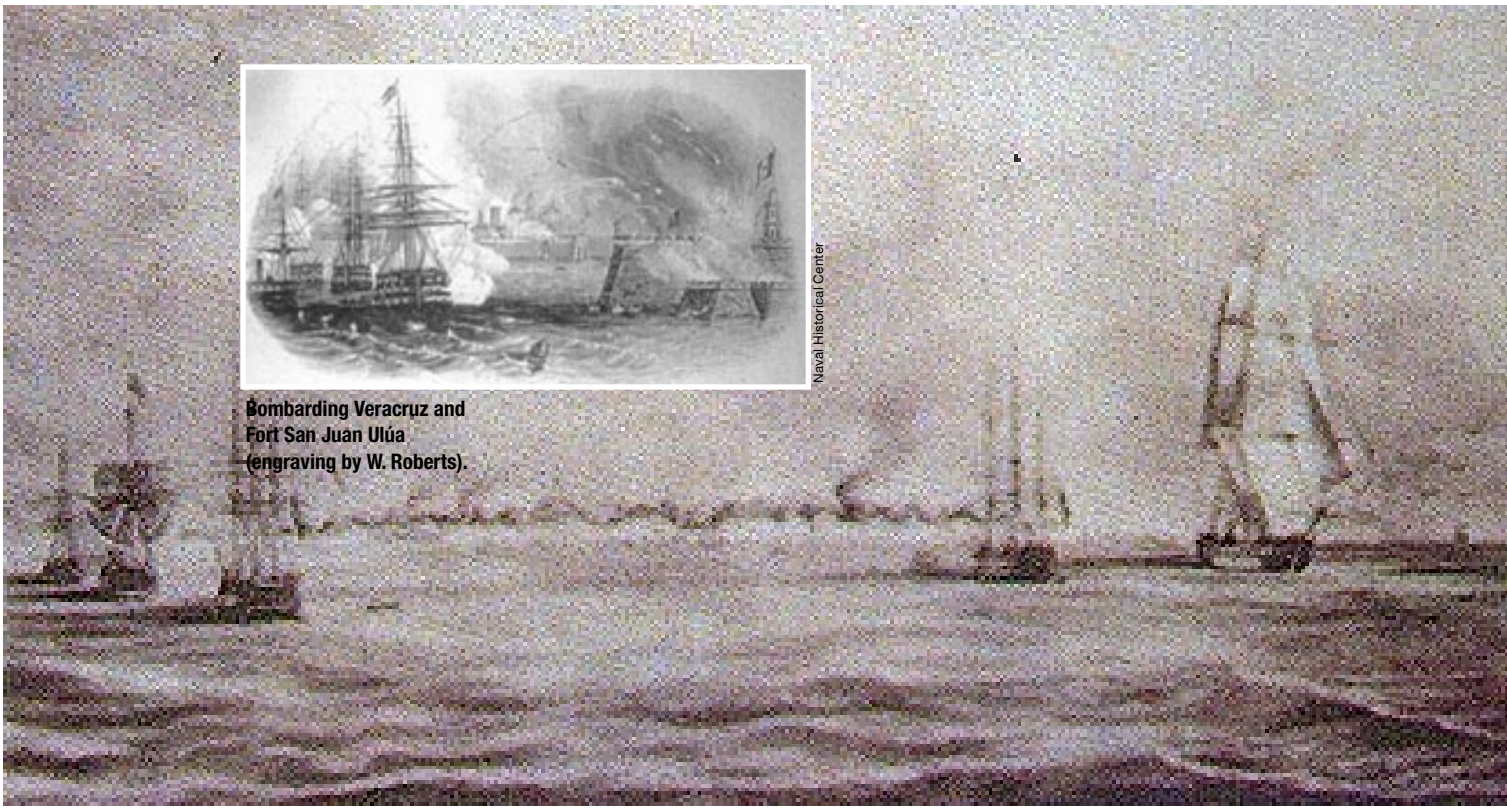
interior?" He admitted to his officers that the Nation would hardly acknowledge a victory "unaccompanied by a long butcher's bill" (referring to praise Taylor's bloody victories had earned in the States), but he would forego "loud applause and aves vehement," and "take the city with the least possible loss of life." Scott's arguments carried the day—the siege continued with renewed support from his commanders and staff.[24]

one critical aspect was constructing positions for siege guns

One critical aspect of the operation was constructing battery positions for siege guns, a task Scott gave to Totten. "Northers" that blew after landing delayed construction as well as unloading the mortars and heavy guns into position. Totten used both regular and topographical engineers as supervisors and infantrymen for the spade work.[25] Though discouraged at receiving only a small portion of the requested artillery, Scott nonetheless wrote to Marcy and expressed appreciation for the help of the Navy: "Commodore Conner's squadron is indefatigable in assisting us."[26]

Despite storms and problems with the logistical build-up on the beach, the operation to choke off Veracruz continued apace. The Army tightened its line of investment, all the roads were secured, and the water supply for the city and fort was cut. American troops were under constant fire, and while work on battery positions was accomplished mostly at night, there were casualties around construction sites. Casualties also resulted from skirmishes with Mexican irregulars who were patrolling the perimeter. Scott sent a letter to the Spanish consul in Veracruz on the 13th with an offer of safe passage out of the city for foreign consuls, adding ominously that "a bombardment or cannonade, or assault, or all" of these possibilities could occur soon. He later recalled that the diplomats "sullenly neglected" his proposition.

Lacking sufficient heavy guns on shore, Scott feared his coming bombardment would not be effective on Veracruz's fortifications. Conner offered to bring naval guns ashore from the fleet and emplace them in land batteries under construction. The commanding general delayed accepting the offer but did inform Conner on the



Bombarding Veracruz and Fort San Juan Ulúa (engraving by W. Roberts).

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Rendevous at Island of Lobos on February 9, 1847 (drawing by Lieutenant Charles Crillon Burton, USN).

19th that Army batteries—prepared in Worth's sector less than a mile south of the city—were almost ready and would open fire the next day. He requested that Conner join in bombarding Veracruz with his ships offshore. Scott delayed the bombardment order, however, and on the 21st decided to accept the earlier offer of naval guns. When Conner came ashore Scott was surprised to see him accompanied by Commodore Matthew C. Perry, who had arrived the previous day to take command of the Home Squadron. Even though the change of command was clearly inopportune, Scott apparently took it in stride and reiterated that he wanted the naval guns.[27]

Scott asked Perry to send six guns ashore and said Army artillerymen would operate them. Perry balked, then calmly replied, "Certainly, General, but I must fight them." While Scott wanted the Army to get credit for manning the guns that he thought would reduce the city, he recognized the Navy's prerogative and agreed. Perry arranged for double naval crews to man the guns, and several hundred Army troops helped drag them across the dunes. Robert E. Lee, almost killed the previous night by an American attempting to desert, was in charge of preparing the emplacement. Lee immediately had a problem with some sailors. Although eager for combat ashore, they could not see the need for laboriously reinforcing the naval position when they were a mile from the fort. Later, when the firing began, they were grateful for the sturdy fortifications. On the 22nd, before the naval battery was ready, Scott decided to begin the bombardment with the three Army batteries. He issued a demand for surrender; when the Mexicans refused, firing began at 1600 hours.

The batteries that opened fire on March 22 did little damage to the fortification but wrecked havoc on civilian structures in the city. More effective fire came from the naval guns offshore. At 1800 hours, Perry ordered the fleet to join in the bombardment. Once again he sent Tattnall of the small steamer *Spitfire* in close to fire on the fort. This time Tattnall took another steamer with him, *Vixen,* and five schooners, *Falcon*, *Reefer*, *Petrel*, *Bonita*, and *Tampico*). Tattnall moved in and dropped anchor in the lee of Point Hornos, a promontory south of the city less than a mile from San Juan de Ulúa. He opened up with every gun in his flotilla of light ships, remaining in position for eighty minutes under heavy counterfire. The guns from *Spitfire* were especially accurate, some rounds reaching Veracruz's central plaza. Although Tattnall had to withdraw after

expending his ammunition, the brave exploit of his gunboats boosted morale among soldiers and sailors alike.

On the 23rd, Scott opened fire with a fourth Army battery after three 24-pounders arrived at Collado Beach, and Perry brought in the huge ship-of-the-line *USS Ohio*, to train its heavy guns to bear on San Juan de Ulúa. And that morning Perry again ordered Tattnall to take his guns back in under Mexican fire to engage the fort. The two men had a strained relationship—Tattnall had never cared for Perry and did not mind expressing his opinion. The gallant commander now had another chance to excel, however, and immediately asked the commodore exactly where he should position his gunboats. Perry replied, "Where you can do the most execution, sir!" Tattnall went in closer, opened up his guns, and withstood a withering response from San Juan. Finally Perry called him back. Tattnall did not see the signal (or ignored it) and stayed on station for another hour. At last Perry sent out Captain Isaac Mayo to order the reckless Tattnall to retire, and he reluctantly did so to cheers from soldiers on the beach, sailors of the Home Squadron, and neutral British, French, and Spanish ships observing the action. Though Tattnall's conduct bordered on insubordination, Perry felt compelled to ask his commanders to "express to the crews his sense of their gallantry."[28]

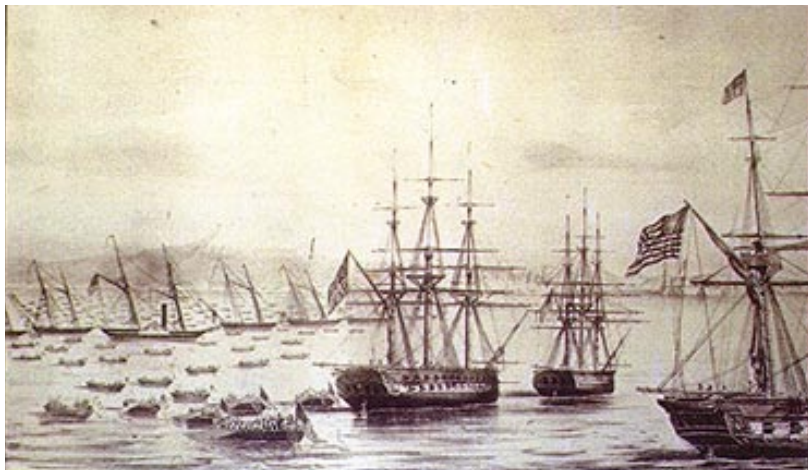
together Army and Navy batteries had a devastating impact

Lee had the naval battery—which some maps denote as "battery no. 5"—ready by the 24th. The six guns Perry furnished, according to one historian, were the heaviest "ever before mounted in siege." Three were long thirty-two pounders which fired 32-pound solid shot. The others were *Paixhans*, a French 8-inch gun which delivered accurate horizontal fire with a 68-pound exploding shell. Lee transferred the battery to Captain John Aulick of the Navy and it went into action on the morning of the 24th. The joint artillery bombarded Veracruz until the naval battery expended its ammunition at 1500 hours. Army fire continued. Since the naval battery had attracted much of the counterfire from the Mexican guns, it had to be repaired and supplied over night. Before first light on the 25th, Perry sent Mayo to relieve Aulick with a new crew and resume firing.[29]

Together, the Army and Navy batteries had a devastating impact on the city and fort. Large gashes appeared in the city's walls (although not the fort's), and at midafternoon of the 25th Mayo observed many Mexican gunners leaving their positions. He rode back to tell Scott he thought the Mexicans had quit the fight. This was not quite true, because in a few minutes they briefly opened fire again. But the battle was over. Mexican fire ceased, and foreign consuls sent out word that they now desired safe passage and also requested that the women and children be allowed to leave. Scott quickly refused, reminding them that they had had their chance and stating that he would now treat only with General Morales. His terms were complete surrender. Morales feigned sickness (apparently to save face) and appointed General Juan Landero to negotiate a surrender with Scott's representatives. The negotiations took most of a day, and terms were reached late on March 26. On the morning of the 28th, the Mexican garrisons of Veracruz city and San Juan de Ulúa marched out to military honors and stacked their arms in front of the assembled Americans.

The capitulation marked the end of a remarkable event in the annals of American military history. While Veracruz represented the largest U.S. amphibious operation prior to World War II, it was completed with relatively few casualties on either side. This was due partly to the baffling Mexican decision not to resist the assault on the beach, where even modest opposition could have brought high casualties, and partly due to Scott's strategy of siege warfare vice infantry assault. He would later comment that it was an "economy of life, by means of headwork." Mexican casualties vary by accounts from 200 to 1,000 killed, but most claims are in the lower range. Scott lost 13 killed in action and 55 wounded. The landing of over 10,000 troops ashore in wooden boats in the span of five hours without any losses was remarkable in itself. The operation surely suffered in the planning phase, adversely affected by Polk's indecision and partisan politics. Even the selection of a commander was done in an unprofessional, roundabout manner. But in the event the best man got the job. He came up with a solid plan, much of it joint in nature. Scott consulted Conner's reports—both the intelligence and recommendations on the landing, siege, and campaign to the interior—throughout his strategic and operational planning for Veracruz. The landing and siege operations were clearly joint, from the positioning of the Army and Navy ships, to the reconnaissance, to the landing, and finally to the Army-Navy bombardment itself.

Scott was not reluctant to give credit to the Navy. On March 30, he issued General Order Number 80: "Thanks higher than those of the



Naval Historical Center

Army leaving the Gulf Squadron with Veracruz in background (drawing by J. M. Ladd; lithograph by N. Currier).

general in chief have also been earned by the entire Home Squadron, under the successive orders of Commodores Conner and Perry, for prompt, cheerful, and able assistance from the arrival of the Army off this coast."

Years after the war, Scott praised the Navy and interservice cooperation. His views were reinforced by President Polk and Secretary Mason, who remarked in his report to Congress that the "entire operation, from the landing of the troops to the surrender brought the Army and Navy into the closest contact." The "courage and skill displayed," the Navy Secretary stated, "were not more honorable to both than the perfect harmony which prevailed."[30]

Veracruz was the Normandy of the 19th century. The landing opened the way for great victories from Cerro Gordo to Mexico City, battles that "conquered a peace" and brought vast new territory to the Nation, forever changing the relationship between the United States of America and the Republic of Mexico. It was also a watershed campaign in the development of jointness. **JFQ**

NOTES

[1] Message of the President to Congress, December 5, 1848, *Senate Executive Documents*, House (vol. 537), 30th Cong., 2d sess., 1847–48, pp. 5–6.

[2] Two studies of Navy and Marine Corps efforts in the Mexican War are K. Jack Bauer's excellent *Surfboats and Horse Marines: U.S. Naval Operations in the Mexican War, 1846–48* (Annapolis: U.S. Naval Institute, 1969), and Gabrielle M. Neufeld Santelli, *Marines in the Mexican War* (Washington: History and Museums Division, Headquarters, U.S. Marine Corps, 1991).

[3] Message of the President, May 11, 1846, in *Senate Document 337,* 29th Cong., 1st sess., 1845–46. Early debates over war policy are found in James Knox Polk, *The Diary of James K. Polk During His Presidency*, edited by Milo Milton Quaife, 4 vols. (Chicago: A.C. McClurg, 1910), vol. 1, April to June 1846.

[4] Polk, *Diary,* vol. 2, p. 16; Marcy to Polk, June 13, 1846, *Senate Document 392*: 29th Cong., 1st sess., vol. 18.

[5] Conner's reports are in Bauer, *Surfboats and Horse Marines*, pp. 9, 15–43.

[6] For Polk's attitude toward Scott, see *Diary*, vol. 1: pp. 407–18, and Ivor Debenham Spencer, *The Victor and the Spoils: A Life of William L. Marcy* (Providence: Brown University Press, 1959), p. 141. His opinion of Taylor grew increasingly hostile as the general's national popularity grew after the Battle of Monterrey in September 1846. By November, Polk was beside himself with distrust of the new national hero. On the 14th, he recorded that Taylor was "unfit for command" of the expedition and was a "bitter political partisan." On the 22nd, he noted that Taylor "is a narrow-minded, bigoted partisan, without resources and wholly unqualified for the command he holds . . . anyone would do better than Taylor." By January 1847 Polk was lambasting Taylor as "wholly incompetent." See Paul H. Bergeron, *The Presidency of James K. Polk* (Lawrence: University Press of Kansas, 1987), pp. 92, 255, 257; Polk, *Diary*, vol. 2: pp. 236, 250, 307. For an excellent account of relations among the major political and military figures of the Mexican War, see John S.D. Eisenhower's "Polk and His Generals," in *Essays on the Mexican War*, edited by Douglas W. Richmond (Arlington: University of Texas Press, 1986), pp. 34–35.

[7] Polk had earlier offered Scott command of all theater forces but had withdrawn the offer when Scott wrote a letter critical of the administration and Polk's leadership. After May 1846 their relationship disintegrated into mutual distrust. See Polk, *Diary*, vol. 1, pp. 396–421, especially the entry for October 22, 1846.

[8] The first paper is in found U.S. Congress, House, *Executive Document 60*, 30th Cong., 1st sess., pp. 1268–70; the second paper is at pp. 1270–74.

[9] On Scott as a disciple of Jomini, see James W. Pohl's "The Influence of Antoine Henri de Jomini on Winfield Scott's Campaign in the Mexican War," *Southwestern Historical Quarterly*, vol. 77, no. 4 (Winter, 1973–74), pp. 85–110. A recent discussion of Scott as a strategist is found in James R. Arnold, *Presidents Under Fire: Commanders in Chief in Victory and Defeat* (New York: Orion Books, 1994), pp. 113, 121. Scott's principal biographer, Charles Winslow Elliot, discusses his strategic thinking and the Veracruz plan in *Winfield Scott: The Soldier and the Man* (New York: Macmillan, 1937), pp. 90, 436–37, as does T. Harry Williams in *The History of American Wars from 1745 to 1918* (New York: Alfred A. Knopf, 1981).

[10] Fletcher Webster, *The Writings and Speeches of Daniel Webster,* 18 vols. (Boston: National Edition, 1903), vol. 16, p. 465.

[11] Bauer, *Surfboats and Horse Marines*, p. 64; Charles L. Dufour, *The Mexican War* (New York: Hawthorn Books, 1968), p. 159; Elliot, *Winfield Scott*, p. 437; Polk, *Diary*, vol. 2, pp. 233–38; Otis A. Singletary, *The Mexican War* (Chicago: The University of Chicago Press, 1960), p. 111.

[12] Polk, *Diary*, vol. 2, p. 227.

[13] Arnold, *Presidents Under Fire*, pp. 99, 100; Polk, *Diary*, vol. 2, pp. 244–46; Singletary, *The Mexican War*, p. 120.

[14] Mission statement is in Merrill L. Bartlett, *Assault from the Sea: Essays on the History of Amphibious Warfare* (Annapolis: Naval Institute Press, 1983), p. 75; quote from *The Mexican War, 1846–1848* (Lincoln: University of Nebraska Press, 1974), p. 237.

[15] Elliot, *Winfield Scott,* p. 444; James M. McCaffrey, *Army of Manifest Destiny* (New York: New York University Press, 1992), p. 166; Singletary, *The Mexican War*, pp. 72–73. Polk had earlier ordered Taylor through Marcy to halt his advance at Monterrey and go on the defensive; Scott's order reinforced this directive. But Taylor ignored it, even after his forces were drawn off by Scott, and he advanced south of Saltillo where he engaged the much larger army of Santa Anna at Buena Vista. That famous victory in February 1847 greatly enhanced his stature as a war hero and carried him to the White House in the following year.

[16] Scott's force estimates are in studies prepared for Marcy. See *House Executive Document 60*, pp. 1268–74.

[17] Surfboat specifications are found in William G. Temple, "Memoir of the Landing of the United States Troops at Veracruz in 1847," addendum to Philip Syng Physick Conner, *The Home Squadron Under Commodore Conner in the War with Mexico, Being a Synopsis of Its Services, 1846–1847* (n.p., 1896), pp. 60–62.

[18] Emma Jerome Blackwood, editor, *To Mexico with Scott: Letters of Captain E. Kirby Smith to His Wife* (Cambridge: Harvard University Press, 1917), pp. 108–09; Dufour, *The Mexican War*, p. 201; Elliot, *Winfield Scott*, p. 451; Douglas Southall Freeman, *R.E. Lee: A Biography,* 4 vols. (New York: Charles Scribner's Sons, 1934), vol. 1, pp. 220–23.

[19] Retracing Scott's campaign in 1993, the authors visited Veracruz and San Juan de Ulúa and inspected the beach from Antón Lizardo to the city. Part of the wall still can be found and the massive fort (now connected to the mainland) is quite intact and a tourist attraction. The beach is largely unchanged and the visitor will come to agree with most commentators on the Mexican War that the site chosen by Scott and Conner for the amphibious landing was superb.

[20] Scott does not mention arriving at Antón Lizardo or the *Petrita* incident in his memoirs. Events on March 5 and 6 are in the following participant accounts: Ethan Allen Hitchcock, *Fifty Years in Camp and Field* (New York: G.P. Putnam's Sons, 1909), p. 237; George Meade, *The Life and Letters of George Gordon Meade, Major-General United States Army*, 2 vols. (New York: Charles Scribner's Sons, 1913), vol. 1, p. 187; and William Starr Myers, editor, *The Mexican War Diary of George B. McClellan* (Princeton: Princeton University Press, 1917), p. 52. Also see Elliot, *Winfield Scott*, p. 455; Freeman, *R.E. Lee*, vol. 1, pp. 223, 226.

[21] Samuel Elliot Morison, *"Old Bruin": Commodore Matthew C. Perry, 1794–1858* (Boston: Little, Brown and Company, 1967), p. 210, and Winfield Scott, *Memoirs*, 2 vols. (New York: Sheldon and Company, 1864), vol. 2, p. 419.

[22] Participant accounts of the landing are in Blackwood, *To Mexico with Scott,* pp. 113–14; Myers, *Diary of George B. McClellan*, pp. 53–54, and Richard F. Pourade, *The Sign of the Eagle* (San Diego: Union-Tribune Publishing Co., 1970), pp. 71–74 (the latter being letters of Lieutenant John James Peck).

[23] A detailed description is contained in a pamphlet by P.S.P. Conner, *The Castle of San Juan de Ullóa and the Topsy Turvyists* (Philadelphia: n.p., 1897). Also see Freeman, *R.E. Lee*, vol. 1, p. 227; McCaffrey, *Army of Manifest Destiny,* p. 168; Scott, *Memoirs*, vol. 2, p. 422.

[24] Elliot, *Winfield Scott,* pp. 458–59; Scott, *Memoirs,* vol. 2, pp. 425–26.

[25] Major John Smith, Captain R.E. Lee, and Lieutenants P.G.T. Beauregard and George McClellan were with Totten as regular engineers (Corps of Engineers). Among those at Veracruz in the Corps of Topographical Engineers were Major William Turnbull; Scott's chief "topog," Captain Joseph E. Johnston; and Lieutenant George G. Meade. See Adrian George Traas, *From the Golden Gate to Mexico City: The U.S. Army Topographical Engineers in the Mexican War, 1846–1848* (Washington: Government Printing Office, 1993), pp. 5, 6, 182–84. Also see Gustavus W. Smith, "Company A Engineers in Mexico, 1846–1847," *The Military Engineer,* vol. 56, no. 373 (September–October 1964), pp. 336–40.

[26] Bauer, *Surfboats and Horse Marines*, pp. 86–87; Morison, *"Old Bruin,"* p. 211; John S.D. Eisenhower, *So Far from God: The U.S. War with Mexico, 1846–1848* (New York: Random House, 1989), pp. 261–62.

[27] Scott, *Memoirs*, vol. 2, p. 427; Smith, *The War With Mexico*, vol. 2, p. 27.

[28] Morison, "Old Bruin," p. 218.

[29] Eisenhower, *So Far From God*, p. 263; Don E. Houston, "The Superiority of American Artillery," in Odie B. Faulk and Joseph A. Stout, Jr., editors, *The Mexican War: Changing Interpretations* (Chicago: The Swallow Press, 1973), p. 106; Elliot, *Winfield Scott*, pp. 458–59.

[30] Scott, *Memoirs*, vol. 2, p. 429; U.S. Congress, "Report of the Secretary of the Navy," December 6, 1847. *Senate Document 1*, 30th Cong., 1st sess., 1847–48, pp. 945–58.

Canadian "Jointery"

Fighter group operations center during Amalgam Warrior 96–1.

Combat Camera Imagery (Greg Suhay)

By JEREMY R. STOCKER

About the only real growth today in Canada's defense establishment is in the area of joint operations. Canada is certainly far from unique in this regard. Where it differs from other nations is that since February 1, 1968 it has not had a separate army, navy, and air force. On that date, the Canadian Army, Royal Canadian Navy, and Royal Canadian Air Force were amalgamated into the Canadian Forces (CF), which poses a difficulty in terminology. While joint operations are generally understood to involve elements of more than one service, Canada in theory has only one service with land, sea, and air elements. But, in practice, joint operations in Canada as elsewhere can be defined as involving operations in more than one *environment*.

Lieutenant Commander Jeremy R. Stocker, Royal Navy, is an anti-air warfare specialist assigned to the staff of the School of Maritime Operations. He recently served on an exchange tour at the Canadian Forces Maritime Warfare Centre.

Since Canada has had unified forces for nearly thirty years, one might think that "jointery" is second nature. Its military institutions, support structures, and much of the training system are unified, with the advantages in rationalization and economy of forces such synergism implies for a small-to-medium sized power. Actual operations, however, were a different matter altogether until recently. Unification was, for various reasons, institutional and bureaucratic, but not operational. The army—Land Forces Command—even managed to retain a British-style regimental system.

Canada, although belatedly, determined that jointness was the way of the future

In terms of its commitment to NATO this distinction between institutional and operational arrangements made some sense for Canada in the Cold War. Maritime Command and Maritime Air Group of Air Command were fully committed to their specialized role of anti-submarine warfare in the North Atlantic. The army, with supporting air elements, was committed to the central front in Germany. Moreover, in addition to supporting other commands, Air Command played a major role with the U.S. Air Force under the bilateral North American Air Defense (NORAD) agreement. These prime tasks proceeded in almost total isolation of one another, reflecting a degree of national specialization in the alliance. Even contributions to peacekeeping operations, in which Canada has a long tradition and takes much pride, tended to be single-environment. Thus Canada has gained far more experience in combined than joint operations.

The end of the Cold War and diminishing defense resources are common to every military establishment. Canada, although more belatedly than some of its allies, determined that jointness was the way of the future. This reflects a determination to get more bang for the buck as well as a recognition that operational needs require much closer links among different warfare environments. In formulating doctrine for planning and conducting joint operations, Canada has unashamedly drawn on the experiences and practices of its allies, the United States and the United Kingdom in particular, adapting ideas where appropriate to its own much smaller forces with their unique needs and concerns. It is worth noting that it seems inevitable that future joint operations undertaken by Canada will also be combined operations.

Together with its allies, Canada foresees that joint operations will be controlled by a joint force commander (JFC) and his staff, but that deployed forces will be contributed by the three existing environmental commands. Forces will be controlled by their respective component commanders or, in smaller operations, a JFC directly. Supporting elements such as communications, logistics, and medical units are provided in unified form, although the individual members wear army, navy, or air force uniforms. The joint headquarters can operate as a Canadian national headquarters, with responsibility for a sector or task in a wider alliance or coalition operation. Alternatively, elements and individuals for more integrated combined joint command structures also can be contributed.

Canadian doctrine for conducting joint and combined operations is evolving, a process that is likely to continue indefinitely, and is contained in a publication known as the "keystone manual." An entire family of publications dealing with different facets of joint operations is derived from this manual, many of which are still under development. This hierarchy of doctrine closely mirrors the system of joint pubs in the U.S. Armed Forces. Prominent in this doctrine are terms familiar to all: principles of war, operational level of war, command and control, et al. Canadian joint doctrine is fully in accord with allied practices and NATO doctrine.

All operations are directed on the strategic level by the Deputy Chief of the Defence Staff (DCDS) who, in turn, is responsible to the Chief of the Defence Staff (CDS). DCDS acts as the chief operations officer, assisted by the Chief of Staff (COS) J-3 and a permanent Joint Operations Staff at National Defence Headquarters (NDHQ) in Ottawa. J-3 issues operational tasking to meet programmed and emergency requirements. The staff is responsible for planning, conducting, and coordinating operations on the strategic level and provides a JFC with a single point of contact at NDHQ. Command on the strategic level is retained by CDS while his other subordinates (namely, the Vice Chief of the Defence Staff, commanders, and civilian assistant deputy ministers) provide forces which are ready to be deployed and advise on their use but are not in the operational chain of command.

Command of a joint force on the operational level is exercised by JFCs who of course have their own headquarters staff. Two types of joint force headquarters (JFHQ) are employed. A formation-based JFHQ serves for operations in and around Canada and for limited international operations. It is situated at one of four Land Force area headquarters or at either Atlantic or Pacific maritime coastal headquarters. An air formation headquarters could also be designated a JFHQ. Such headquarters would normally remain static in their existing facilities but conceptually could be deployed.

For more complex operations, a deployable JFHQ is established, based on the headquarters of the 1st Canadian Division and augmented with appropriate cross-environmental staff. Normally based in Kingston, Ontario, the division's headquarters remains a Land Force unit; but in a joint operation it answers directly to the Joint Staff at NDHQ. JFCs are appointed by CDS for particular operations and drawn from the environment most appropriate to the task. This deployable JFHQ, though based on an army headquarters, has permanent dark- and light-blue augmentees who wear only J hats, whereas the army staff tends to wear both G and J hats. The continental staff system employing G, N, or J designations (1 through 6) is used across all headquarters in Canada.

Component commanders of a joint force can be part of the JFHQ staff but may well be in separate headquarters. A land component commander, for example, can be a brigade commander with his own staff and headquarters. A naval component commander is likely to be a commander task group (CTG) at sea, though he could be ashore. The concept of the joint force air component commander (JFACC) is part of Canadian joint doctrine, but on a modest scale. Of the component commanders, JFACCs are the most likely to be collocated with JFCs.

doctrine for planning joint operations on the strategic level is well advanced

Given that any significant deployed force will almost certainly be part of a wider alliance or coalition, CF may operate in a distinct national area of responsibility, with operational control of forces remaining under a Canadian JFC. Alternatively, control of one or more components may be passed to a separate coalition headquarters (which probably would have some Canadian content), with a more limited national JFHQ to address unilateral concerns. Command on the tactical level is exercised by JTF commanders, when appointed, and by the separate component commanders.

Key to the Canadian concept of jointness is the joint operations planning process (JOPP). This is now routinely employed in exercises as well as real-world operations as, for example, in Operation Cobra, the plan for withdrawing Canadian forces from the former Yugoslavia. So far as possible, JOPP utilizes pre-existing contingency operation plans (COPs), thus reducing reliance on ad hoc planning in a contingency. Plans provide for establishing joint headquarters and deploying front line forces and supporting elements.

Canadian planning is generally capability-based, working with force levels that realistically might be available. This represents something of a shift from the Cold War when commitment-based planning was the norm. The list of available forces (see figure) that can be deployed for a particular operation is clearly identified, each part supported by an OPLAN. This list is by no means the full range of Canadian forces, but it indicates the force size that could conceivably be available for given operations. During the Persian Gulf War, for example, Canada deployed a naval task group and CF–18 fighters but not ground troops. Current operations outside Canada, almost all U.N. peacekeeping missions, involve 3,500 out of a total of 60,000 personnel. Most are in the Adriatic or the former Yugoslavia and others in Rwanda and Haiti. A few serve in places as far apart as Cambodia, Sinai, and Mozambique. In this Canadians are no different from any other nation, though it is probably fair to say that the range and size of their commitment to U.N. operations is without parallel for a country with its resources. The army, in particular, feels the familiar "overstretch," with some soldiers having served three or four tours in Bosnia or Croatia.

The development of Canadian doctrine for planning joint operations on the strategic level is well advanced. On the operational level staffs are fast gaining knowledge and experience. On the tactical level doctrine is rather more patchy. In some important areas Canada has not developed doctrine and procedures that enable forces from different environments to operate together. For example, although there is some experience with army low-level air defense attachments being deployed on board ships, such assets have yet to be fully integrated into overall task group air defense procedures. In other areas, however, things are doing better. NATO coordinated air-sea procedures have been adapted to fit the Canadian region of NORAD. Comparatively few modifications were needed. Voice and data links with the Sector Operations Control Centre at North Bay, Ontario, are standard for Canadian ships, and related command and control is becoming progressively more complex and ambitious.

"Jointery" is alive and well and is fast maturing in Canada. Structures may differ, but the concept is much the same as in other countries. Significantly, *joint* is only half the equation, and *combined* features just as much in Canadian defense thinking. **JFQ**

List of Available Canadian Forces

- deployable joint force headquarters
- mechanized brigade group
  - —up to three infantry battalions
  - —armored regiment
  - —artillery regiment
  - —combat engineer regiment
  - —other brigade-level forces (low-level air defense, military police, intelligence, ambulance, and service battalion units)
- naval task group
  - —*Iroquois*-class anti-air warfare/command destroyer
  - —up to three *Halifax*-class anti-submarine warfare frigates
  - —AOR (auxiliary)
- wing (two squadrons) of CF–18 *Hornet* fighters
- tactical helicopter squadron
- *Aurora* maritime patrol aircraft detachment
- support group
- medical group

Improving **Force Closures**

By GEORGE A. ROLLINS

The term *improving force closures* (IFC) can cause consternation at first blush. For those unfamiliar with it, IFC might suggest a reduction in personnel or the elimination of an installation; but it is actually a significant feature of military strategy. As defined in Joint Pub 1–02, *Department of Defense Dictionary of Military and Associated Terms*, a force closure means "The point in time when a supported commander determines that sufficient personnel and equipment resources are in the assigned area of operations to carry out assigned tasks." This article discusses the importance of, and actions taken with regard to, the future role of IFC.

First, to understand IFC one must fracture several military paradigms. The most prevalent is the ever-present propensity to identify requirements, set objectives to achieve them, and institute timetables. This standard military approach is beyond the realm of IFC, which involves all aspects of strategic mobility. Because of the inherent complexity of strategic mobility, a strict orchestration of objectives or timetables is an improbable undertaking at best. A review of the details of mobility supports this point. Strategic mobility includes, in reverse order from a potential combat area, host nation agreements and treaties, host nation facilities, harbors, sealanes to the area, transport ship and aircraft procurement and maintenance, American port and airport facilities along with highways and railways to them, merchant marine ships, commands and services, longshoremen's unions, Federal and state highway regulations, and most importantly our national strategy. Each involves continuous evolution which complicates forming quick or simply understood procedures.

The Army "fleet."

DOD

we must be able to deploy on shorter notice and over greater distances to perform a wider range of missions

Reductions in force, combined with global insecurity, have dramatically changed the way we carry out missions. As the only remaining superpower, the United States is increasingly called upon to provide forces for a range of operations, including humanitarian, peacekeeping, and peace enforcement missions. This demands addressing smaller conflicts in many locations. Accordingly, we must be able to deploy on shorter notice and over greater distances to perform a wider range of missions than before. Many operations involve building coalitions with other nations and working with nongovernmental organizations. Most future deployments of our forces are likely to be a part of a joint operation involving both active and Reserve component forces.

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Attendant to such deployments will be the requirement to transport a large force. Most of our combat power, particularly heavy ground forces, are now in the contiguous forty-eight states. Shipping is the most credible method of transporting bulky forces across the globe. Airlift, though the swiftest mode of transport, has severe weight limitations and thus is mainly used to supplement shipping. It is primarily employed for moving personnel and light equipment whereas shipping by sea is more suitable for hauling ammunition and heavy equipment. Rapidly projecting forces from North America requires a system with fewer personnel and less equipment, especially in the area of strategic mobility. This is the rationale for IFC, which has the sole purpose of ascertaining ways to improve the Nation's ability to transport large forces.

IFC is chartered to develop, implement, and monitor initiatives that improve force closure to include recommendations arising from findings of the *Mobility Requirements Study: Bottom-Up Review Update* (MRS BURU). A general officer steering committee is charged with coordinating and guiding IFC activities. It is comprised of representatives of unified commands, services, and relevant agencies and co-chaired by the Director for Operational Plans and Interoperability (J-7) and the Director for Logistics (J-4), Joint Staff. The committee meets three times a year to discuss current mobility and logistical issues. The Joint Staff coordinates inputs through several action officer-level meetings at which members may raise pertinent issues.

IFC came into being in 1989 as a means of improving force closures for Europe (IFCFE). The initial results of IFCFE made it obvious that significant reinforcement efficiencies are attainable through intensive OPLAN analysis and innovative procedures for executing national strategy. The IFCFE effort showed potential for expanding IFC to other global and regional OPLANs. Thus, in 1990, IFC was mandated to develop recommendations to enhance U.S. capabilities to respond rapidly, effectively, and efficiently to global and regional contingencies. In 1992, IFC received the additional task of addressing recommendations of the Mobility Requirements Study and later from MRS BURU. In 1993 and again in 1994, IFC members unanimously voted to extend the charter, and their recommendation was approved by the Director of the Joint Staff.

IFC was mandated to enhance U.S. capabilities to respond to global and regional contingencies

Since its inception IFC has addressed topics involving sealift, airlift, prepositioning, force structure, and warfighting requirements. Specific items include Army prepositioning, strategic lift issues raised by CINCs as well as the individual services, strategic sealift, Ready Reserve Force, maritime prepositioning force, joint exercises, West Coast ammunition ports, in-transit and total asset visibility, berth availability, host nation status, Reserve mobilization, MRS BURU implementation, and joint logistics over the shore, fort-to-port, port-to-port, and port-to-foxhole.

Navy beach group constructing temporary pier.

DOD

Ready Reserve Fleet roll-on/roll-off ships

DOD

To gain a better perspective on the specific components within their domain, IFC members visited the Hampton Roads area in April 1995, where many of the assets integral to IFC are situated. The tour included Navy Beach Group–2 at Little Creek Amphibious Base, Ready Reserve Force roll-on/roll-off ships at Norfolk and Hampton Roads, and 7th Transportation Group facilities and ships at Fort Eustis. This offsite visit provided a better appreciation of the challenges facing IFC.

The continuing relevancy of IFC stems from its ability to address most strategic mobility issues. As our national military strategy is redefined and becomes more efficient, IFC is assisting in this complicated process. The general officer steering committee recently refined the purpose of IFC as a sounding board, forum, and reference for recommendations or proposals involving force closures. This will provide an avenue for sharing information among all components to improve our overall force closure capability. **JFQ**

General Maxwell Davenport Taylor

(1901–1987)

Chief of Staff, U.S. Army
Chairman, Joint Chiefs of Staff

VITA

Born in Keytesville, Missouri; graduated from Military Academy (1922); served in corps of engineers, then transferred to field artillery (1922–27); studied in Paris and taught French at West Point (1927–32); Field Artillery School (1933); Command and General Staff School (1935); American Embassy, Tokyo, and military attaché in Peking (1935–39); Army War College (1940); War Plans Division on defense mission to Latin America (1940); commander, 12th Field Artillery Battalion (1940–41); office of the secretary, General Staff (1941–42); chief of staff, and artillery commander in Italy, 82d Airborne Division (1942–44); commander, 101st Airborne Division, at Normandy and in European campaigns (1944–45); superintendent, Military Academy (1945–49); chief of staff, European Command (1949); commander, U.S. forces in Berlin (1949–51); assistant chief of staff for operations and then deputy chief for operations and administration (1951–53); commander, Eighth Army in Korea (1953–55); commander in chief, Far East Command (1955); chief of staff, U.S. Army (1955–59); retired (1959); recalled as military representative of President (1961–62) and Chairman, Joint Chiefs (1962–64); ambassador to Republic of Vietnam (1964–65); chairman, President's Foreign Intelligence Advisory Board (1965–69); and president, Institute for Defense Analyses (1966–69); died at Washington, D.C.

U.S. Army Center of Military History

Portrait by Bjorn Peter Egeli.

[President Kennedy] assured the Joint Chiefs that he did not regard them as narrow military specialists but as men of wide international experience who could help him in evaluating the broad context of many situations, particularly those requiring a combined input from many sources within government. To give his opinion lasting official status, this historic statement of the advisory role of the Joint Chiefs was incorporated in a National Security Memorandum, which was continued in effect throughout the Johnson administration and . . . revalidated by President Nixon.

—From *Precarious Security* by Maxwell D. Taylor

Organization

UCP CHANGES

The Secretary of Defense announced changes on February 7, 1996 to the unified command plan (UCP) which allocates responsibilities among combatant commands. This plan provides guidance to unified combatant commanders; establishes their missions, responsibilities, and force structure; delineates geographic areas of regional combatant commanders; and specifies the responsibilities of functional commanders. The five regional commands are U.S. European Command (EUCOM), U.S. Pacific Command (PACOM), U.S. Atlantic Command (ACOM), U.S. Southern Command (SOUTHCOM), and U.S. Central Command (CENTCOM); the four functional commands include U.S. Space Command (SPACECOM), U.S. Special Operations Command (SOCOM), U.S. Transportation Command (TRANSCOM), and U.S. Strategic Command (STRATCOM).

The Americas. The SOUTHCOM area has been expanded to include the waters adjoining Central and South America and the Gulf of Mexico, formerly ACOM responsibilities. This will enhance interaction between SOUTHCOM and the navies of Central and South America as well as assign control of all U.S. military activities in the Caribbean basin and Central and South America to one unified commander. This transfer is being implemented in distinct phases. The first, which shifted responsibility for the waters adjoining Central and South America, occurred on January 1. The second phase, to be implemented by the Secretary not earlier than June 1, 1997, will transfer an additional portion of the Atlantic Ocean, the Caribbean Sea and its island nations, and the Gulf of Mexico to SOUTHCOM (a map of the region will accompany the JFQ Forum on "The Security of the Americas" in the next issue).

The Gulf Region. The boundary between the PACOM and the CENTCOM areas has been adjusted to assign responsibility for the Arabian Sea and part of the Indian Ocean to CENTCOM. This transfer moved the boundary away from choke points in the region and provides CENTCOM with the land, sea, and air battlespace needed to conduct joint operations and training.

Strategic Reconnaissance. The mission of STRATCOM has assumed responsibility for the conduct of global airborne reconnaissance in support of strategic operations, the single integrated operation plane (SIOP), or other strategic missions as directed.

By law the plan is reviewed periodically by the Chairman. The most recent review was concluded early last year and the Chairman's recommendations were submitted to the Secretary of Defense who then forwarded them to the President who approved the new UCP December 28, 1995. JFQ

STANDING JTF HEADQUARTERS

When confronted by a pending crisis that requires military action, the principal response is to form a joint task force (JTF) under ad hoc headquarters. Unfortunately, this method of standing up JTF headquarters precludes quick attainment of staff efficiency and effectiveness, both of which are critical to crisis action planning. To eliminate these problems, the Marine Corps established the core of a standing JTF headquarters in December 1995. Formally designated Standing Joint Task Force Headquarters (SJTF HQ), Marine Forces Atlantic, and located at Camp Lejeune, it is being organized and equipped to rapidly respond to crises anywhere along the world's littorals.

The core of SJTF HQ was formed around 49 marines and sailors with joint experience and is scheduled to expand the nucleus to include nearly 200 members drawn from every service. While the JTF headquarters will be able to execute a lesser regional contingency for combatant commanders, its primary focus will be on military operations other than war (MOOTW).

SJTF HQ is currently undergoing initial staff training and identifying long-term equipment and support needs. The target date for achieving a fully capable, joint nucleus with expeditionary C^4I capabilities is August 1997. Thereafter, the unit will continue to refine its tactics, techniques, and procedures and to increase its operational expertise through follow-on training and exercises. The inaugural exercise deployment is slated for September 1996 when it will serve as the combined JTF headquarters under U.S. Southern Command for Fuerzas Aliadas Riverine '96.

For additional information, the Standing Joint Task Force Headquarters may be contacted at (910) 521–8581/ DSN 484–8581. JFQ

Doctrine

JOINT DOCTRINE WORKING PARTY

The 16th meeting of the Joint Doctrine Working Party was hosted by the Joint Warfighting Center at Fort Monroe on October 24 and 25, 1995. The center is an integral part of the Directorate for Operational Plans and Interoperability (J-7), Joint Staff, and assists the Chairman, service chiefs, and CINCs by developing and assessing doctrine for joint and multinational operations as well as by providing support for joint and multinational training and exercises.

At the meeting, the Chairman commended working party members for their achievements but stressed the need to refine doctrine through high-level debate, specifically recommending *JFQ* as an ideal forum in which to conduct an exchange of ideas. He also emphasized that warfighting must be based on joint doctrine and that senior leaders must become more involved in the joint doctrine process. Joint pubs, the Chairman said, must be living documents that test the validity of joint doctrine in operations and exercises. Moreover, he indicated that doctrine development must be disciplined yet flexible to take advances in technology into account.

In a follow-up to this meeting, the Chairman approved a "Joint Doctrine Awareness Action Plan" to keep joint doctrine at the forefront of military affairs. The plan will inaugurate a series of professional products to enhance joint doctrine awareness throughout the Armed Forces.

The next meeting of the Joint Doctrine Working Party will be held on April 16–17 in Norfolk, Virginia. JFQ

Education

NEW PEACEKEEPING CENTER

Founded by the Canadian government, the Lester B. Pearson Canadian International Peacekeeping Training Centre began its activities in April 1995. The centre offers programs on every aspect of peacekeeping to intermediate and senior leaders including interdisciplinary cooperation, negotiation and mediation techniques, personal support for peacekeepers, the maritime dimension of

peacekeeping, human rights in peacekeeping, refugees and displaced persons, investigating atrocities and crimes against humanity, the legal framework of peacekeeping, military operations, and administrative and logistical problems of peacekeeping missions.

The Peacekeeping Management, Command, and Staff Course is the capstone activity and aims to develop an international, multidisciplinary group of leaders capable of assuming positions in their respective organizations. This seven-week course includes field trips to U.N. headquarters in New York as well as to the peacekeeping mission in Haiti.

Of particular interest is a visiting scholar program open to experts from around the world which has attracted scholars from Japan, Italy, and the United States. Moreover, a Korean officer recently became the first fulltime international faculty member. The centre has hosted military and civilian participants from more than forty countries and is forging ahead with a number of activities in the areas of research, education, and training.

For further details, write: Pearson Peacekeeping Centre, Cornwallis Park, P.O. Box 100, Clementsport, Nova Scotia BOS 1E0; telephone: (902) 638–8611; FAX: (902) 638–8888. JFQ

STRATEGIC LANDPOWER ESSAY CONTEST

The U.S. Army War College and the U.S. Army War College Foundation have announced the first annual "Army War College Strategic Landpower Essay Contest." The topic of all entries must be related to the advancement of professional knowledge of the strategic role of landpower in joint and multinational operations. A cash prize of $1,000 will be awarded for the best essay. Entries must be postmarked on or before May 1, 1996. For more information write to COL John Bonin, USA, ATTN: DMSPO, U.S. Army War College, Carlisle Barracks, Pennsylvania 17013, or telephone (717) 245–3435/DSN 242–3435. JFQ

JOINT WARFIGHTING ESSAY CONTEST

The U.S. Naval Institute is inviting entries in the annual "Colin L. Powell Joint Warfighting Essay Contest." Essays should focus on combat readiness in a joint context—persuasive discussions of tactics, strategy, weaponry, combat training, force structure, doctrine, operations, organization for combat, interoperability, or other issues involving two or more services. Submissions from both military personnel and civilians are welcome but must be postmarked on or before April 1, 1996. The three best essays will be awarded cash prizes of $2,500, $2,000, and $1,000 and published in the *Proceedings*. Contest rules and further details are available by writing the U.S. Naval Institute, 118 Maryland Avenue, Annapolis, Maryland 21402–5035, or by contacting Valry Fetrow at (410) 268–6110. JFQ

AIR FORCE HISTORY SYMPOSIUM

The Air Force History and Museums Program has issued a call for papers to be given at a two-day symposium, entitled "Aim High: History of the U.S. Air Force, 1947–1997," to be convened in Washington during either April or May 1997 to commemorate the 50th anniversary of the service. For particulars write: Dr. Jacob Neufeld, ATTN: AFHSO/HOX, 110 Luke Avenue (Suite 405), Bolling Air Force Base, Washington, D.C. 20332–5113; or FAX: (202) 767–5527. JFQ

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Gary W. Anderson, "Campaign Planning for Operations Other Than War," *Marine Corps Gazette*, vol. 80, no. 2 (February 1996), pp. 45–47.

Henry A. Black, "The Service Component Command," *Marine Corps Gazette*, vol. 80, no. 1 (January 1996), pp. 49–51.

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Eliot A. Cohen, "Airpower, the Next War, and the Marine Corps," *Marine Corps Gazette*, vol. 79, no. 11 (November 1995), pp. 38–44.

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INSTITUTE FOR NATIONAL STRATEGIC STUDIES
NATIONAL DEFENSE UNIVERSITY

Joint Warfare in the 21st Century: Where Have We Been and Where Are We Going

The third annual joint operations symposium will be held on August 13–14, 1996 at the Armed Forces Staff College in Norfolk, Virginia.

The Goldwater-Nichols DOD Reorganization Act: A Ten-Year Retrospective

The annual topical symposium will be held on December 3–4, 1996 at the National Defense University in Washington, D.C.

For details on future symposia or registration material on the above events, please contact:
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Fax: (202) 685–3866/DSN 325–3866
Internet: grahamj@ndu.edu

Further information on upcoming events, recent publications, et al. is available to Internet users via the National Defense University World Wide Web server. Access any Web Browser (for example, Mosaic or Netscape) by addressing http://www.ndu.edu. Symposia programs and registration material are normally posted on the server 90 days prior to events.

U.S. Marine Corps

MOGADISHU DUET [PART ONE]

A Book Review by
ROBERT B. OAKLEY

Losing Mogadishu: Testing U.S. Policy in Somalia
by Jonathan Stevenson
Annapolis: Naval Institute Press, 1995.
217 pp. $19.95
[ISBN 1–55750–788–0]

In the introduction to *Losing Mogadishu*, Jonathan Stevenson spells out his aim: to "extract lessons" about American involvement and explain "the psychology of American decisionsmaking." He views our experience in Somalia as analogous to that in Vietnam and as "a veritable laboratory of American military policy, U.S. foreign policy in the Third World, and Washington's proper relationship with the United Nations." He puts his finger squarely on what has emerged during the Clinton administration as a critical and hotly debated aspect of foreign policy: where to intervene and when. He also focuses on important questions that arose during the period of active U.S. and U.N. involvement in 1992–95 and draws several conclusions from them, including parallels with Vietnam. The narrative as well as the numerous anecdotes and citations found in the book make it easy to read, fast-paced, and colorful.

Losing Mogadishu is divided into eleven chapters which bear titles as lively as the author's style and reflect a penchant for drawing general conclusions: "Dissemblance as Ethos," "Building the Perfect Beast," "High-Concept Foreign Policy," and "Moral Compulsion in Foreign Policy." One chapter, which explicitly enumerates seven lessons, poses a most pertinent question about the basic efficacy of outside intervention in situations such as Somalia or Rwanda. The final chapter discusses the proper relationship between the United States and the United Nations. These are issues which remain alive and well today in political debates within the administration and Congress over U.S. policy on Haiti, Bosnia, and the United Nations.

Unfortunately, Stevenson's overriding interest in conclusions (for instance, about Somalis or President Bush's motive for intervening) lead him to fluctuate between a chronological, factual account of events and numerous generalizations that he derives from them. Each chapter tends to cover the entire period from the authoritarian rule of Siad Barre during the Cold War to the chaotic early 1990s as the United States intervened through Operation Restore Hope (UNITAF), resulting in a repetition of events. On occasion he juxtaposes in one paragraph events which took place at different times, under dissimilar circumstances, pursuant to assorted administration policies and various mandates from the Security Council. This gives the impression of continuity that did not exist in the thinking, objectives, and actions to implement the policies under the Bush and Clinton administrations, nor in command on the ground. UNOSOM, UNITAF, and UNOSOM II were totally different in concept, mandate, and implementation—not a continuum, despite the fact that they occurred in succession.

This author's approach, however, gives him greater flexibility in drawing conclusions from the "living laboratory" and pursuing the Vietnam analogy, making it easier to generalize about the series of events. Unfortunately, in so doing, some details are overlooked or omitted, which would raise doubts about the validity of the conclusions. One is the fact that U.N. Special Representative Jonathan Howe at no time had control over or gave orders to Task Force Delta which mounted the ill-fated Ranger assault in October 1994. The thesis that the Clinton administration turned over our policy and forces to the United Nations is inaccurate, though they were very much in parallel.

But Stevenson is careful to present views which do not always accord with his own to the point where he sometimes appears to reach alternative conclusions on the same events in different places. Since any number of conclusions can be drawn about Somalia, this approach is valid and makes the book more lively even if the end result is a bit confusing.

One example is the claim that George Bush thought that Somalia exemplified "the concept of the world order" and a prototype for dealing with Third World problems. There is no evidence to support such a sweeping conclusion, and the author is careful in other places to point out that Bush was intent (albeit

Americans in Mogadishu boarding C–5 for home.

U.S. Air Force (James Mossman)

Ambassador Robert B. Oakley served as special envoy to Somalia under Presidents Bush and Clinton.

unrealistically) on completing a relief-only mission by January 1993. The President and his national security team saw Restore Hope as limited in scope and duration, a one-time affair. Moreover, in a press conference on December 4, 1992, then Secretary of Defense Dick Cheney explicitly rejected the idea that it could be completed by January 20.

The President, Secretaries Cheney and Eagleberger, and General Powell were very clear on the limited mission of UNITAF in public statements, orders to U.S. military and civilian leadership in the field, and discussions with troop contributing nations and the Secretary General. Such long-term projects as disarmament and other elements of what, as a result of Somalia, have come to be termed *mission creep* and *nationbuilding* were to be avoided. Larger policy and operational issues would be properly left to the incoming Clinton administration, the newly-elected Congress, and the Security Council when it decided on the mandate for a new peacekeeping operation to succeed the U.S.-led operation.

While Stevenson recounts the constraints put on Restore Hope, he implies that they were due to a failure of vision by the Bush administration. He seems to not recognize that the limitations were due in part to lessons already learned during the Reagan-Bush years (sometimes the hard way as in Lebanon, Grenada, and Panama) and in part to the President's lame-duck status. Most of the lessons found in chapter 7 of *Losing Mogadishu* were applied during Restore Hope. This included using military intervention as the last resort. It took place only after the sequence of other events accurately reported by Stevenson, including the sacking of the effective U.N. negotiator Mohamed Sahnoun, led to more than 300,000 Somalis dead and many others facing death without immediate help. Only a relatively massive, well-organized military-humanitarian operation could remedy this situation. And it did. Moreover, famine has not returned to Somalia three years after UNITAF. Other lessons which the author cites, such as "know your enemy" and "let soldiers be soldiers," were applied. U.S. forces did not underestimate Aideed or guerilla fighters during Restore Hope. They displayed a capability to hit back hard if necessary and avoided being taken by surprise and, at the same time, exercised restraint in using force and maintained a constant dialogue with Aideed, other warlords, and a broad cross-section of Somali society. This minimized conflict and resulted in a surprisingly low number of casualties.

The net effect of the Restore Hope approach was to largely avoid conflict with the warlords while removing most of their fighters and weapons from the streets; to maintain excellent cohesion, command, and control over the 25-country military coalition; and to establish effective coordination between the coalition and over eighty international and nongovernmental organizations. This put a temporary end to three years of intensive civil war as well as mass death from famine and disease within six weeks even if it did not end all political violence. It also enabled the United Nations to facilitate a broad set of political agreements that were signed by all 15 Somali factions at the March 1993 conference in Addis Ababa, even if subsequent events precluded their implementation.

A series of decisions made by newly-elected President Clinton and his advisers was indeed of the general, long-term visionary nature described by Stevenson (though erroneously attributed to the Bush team). So were the views of the Secretary General and the resolutions by the Security Council establishing the mandate of UNOSOM II. Their ideas on what should and could be done, and the resources needed to achieve those sweeping objectives, failed to recognize Somali realities. The result, as the author indicates, was a disaster for the United States and the United Nations, and for prospects of political reunification and peace in Somalia. Like Vietnam these events indeed had a major impact on the administration and Congress, raising grave doubts about peace operations elsewhere, the utility of the United Nations, and the will of the Nation to run any risks abroad.

But the Clinton administration seems to have subsequently relearned many lessons found in chapter 9 of *Losing Mogadishu* and applied in Somalia under the Bush administration. In deciding to intervene in Haiti, we undertook a major U.S.-led, Security Council-approved peace operation analogous to Restore Hope. It was followed, as in Somalia, by a full-fledged, U.N.-commanded operation in which the United States was the major troop contributor. The initial action in Haiti was notable for the restrained application of overwhelming force by the Army and Marine Corps. The analysis of local conditions, choice of objectives, and assessment of resources needed for both the U.S.- and U.N.-led operations was much more realistic than in Somalia, and the transition to U.N. peacekeeping far better coordinated. There was close cooperation between U.S. civilian and military leadership, and with the U.N. representative once he took over. Even though the Clinton administration and other players may be disappointed that their plans for democracy and economic revitalization in Haiti have not been fully realized or are running behind schedule, there has been a willingness to adapt to the local realities and settle for less—rather than insisting on the forceful imposition of values and political institutions conceived by outsiders on recalcitrant and potentially hostile local power groups, as occurred in Somalia.

The Haiti episode has taken place within the context of a more limited, pragmatic view of the United Nations and the concept of peacekeeping by the Clinton administration and Congress. On the other hand, in December 1995 the administration undertook a peace operation in Bosnia under a coalition that is much larger and more complex than those in Somalia or Haiti, albeit under NATO rather than U.N. command. It has the potential for making wrong turns, which Stevenson evoked in examining Somalia, though the Bosnian operation has been marked by careful planning, cautious implementation, overwhelming force used with restraint, and constant dialogue with all parties. JFQ

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MOGADISHU DUET [PART TWO]

A Book Review by
JONATHAN STEVENSON

Somalia and Operation Restore Hope: Reflections on Peacemaking and Peacekeeping
by John L. Hirsch and Robert B. Oakley
Washington:
U.S. Institute of Peace Press, 1995.
208 pp. $26.95
[ISBN 1–878379–41–0]

Somalia and Operation Restore Hope is an informative and basically sincere contribution to the slow, incremental debate over the proper criteria and execution of "humanitarian intervention." While the book contains little that can be labeled controversial or provocative, it has an assiduously clinical and nonspeculative approach that reveals a great deal about the idiom of American foreign policy and how it is found wanting.

Even though U.S. special envoy Robert Oakley was the key player during the early stages of U.S. involvement in Somalia, and John Hirsch was his adviser, the book is not a whitewash of the American role. President Bush's authorization of the intervention, they suggest, was premised on a combination of expedience in public relations: "a definable mission had emerged" and "the goodwill to be gained from helping out in Somalia might help offset criticism that the United States was dilatory in responding to aggression in Bosnia." The authors admit that the United Nations and Washington erred in demonizing General Mohamed Farah Aideed while remaining obdurately blind to his charismatic power. They intimate that these mistakes led ultimately to the October 3, 1994 firefight in which 18 Americans were killed, 78 were wounded, and the U.S. Government was humiliated. And they gently implicate Admiral Jonathan Howe, the U.N. special envoy from March 1993 until February 1994, and later U.N. Secretary General Boutros Boutros-Ghali, as the purveyors of the "peremptory, intrusive attitude" toward Somalis that lamentably replaced Oakley's more mediative and nonpartisan approach.

On the other hand, Hirsch and Oakley's analysis of Operation Restore Hope itself—that is, the initial U.S. intervention on December 9, 1992, and the ensuing four and a half months—does contain a trace of defensiveness. During this period, the United States, through the Unified Task Force (UNITAF), enjoyed command of all forces in Somalia. Through early March 1993, Oakley was the highest-ranking U.S. civilian on the ground. According to the authors, UNITAF's tenure was marked by a firm if limited approach to disarmament. In fact, there was a degree of vacillation in UNITAF's weapons policy which gave Somali gunmen a window of opportunity. Similarly, the authors point out that merely establishing "points of security" was insufficient during the U.S. airlifts that preceded Restore Hope but do not mention that UNITAF's "areas of positive control" were limited in size. UNITAF did not really pacify Somalia. Overt clan problems in Kismayu, the southern port, were ongoing from February 1993 forward.

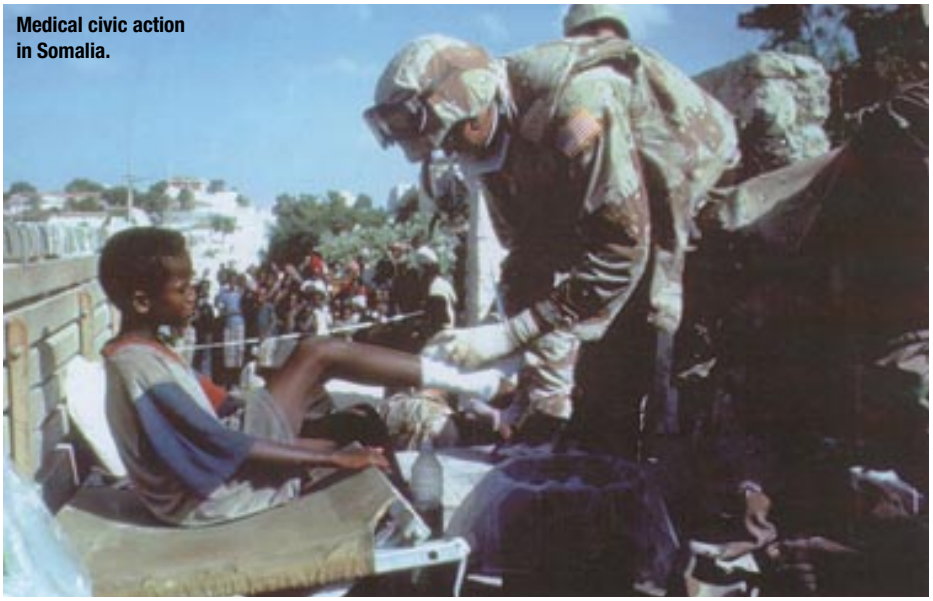
The authors confer perhaps inordinate promise on what few rudiments of civil government did develop in Somalia under UNITAF. A police force and court system (which the disarmament policy was meant to inspire) did begin to operate but lost vitality when the U.N. took over and the lawless among the Somalis took advantage. The "transitional national council" plan, conjured by Somali factions at the U.N.-sponsored conference in Addis Ababa in March 1993, was far less genuine—and thus less salutary—than Hirsch and Oakley suggest in their uninflected account of events. The notion was in fact cobbled together by the groups to salvage Somalia's global image after Aideed's threat to abort the meeting because of an attack in Kismayu by Siad Barre loyalists. It was toothless almost by design. Consequently, the author's conclusion that the Somalis "were given every opportunity" to rebuild their country may be overstated. They probably needed some overarching development plan that was not forthcoming from UNOSOM II. But the larger point, that ultimately the responsibility for Somalia's welfare rests with Somalis, is surely correct.

Some of Hirsch and Oakley's most incisive and important points are cast as afterthoughts. The authors acknowledge that Americans often failed to grasp Somali culture—with operational consequences—but do not elaborate. The lack of cohesion in command and control of UNOSOM II is confined largely to a trenchant footnote. Elsewhere in a footnote they uncritically recount an unpublished report by an adviser to Howe which concluded that Aideed should be prosecuted by an international or local court. This transparently dubious option appears to have been seriously contemplated. Obviously it never panned out, but it would have been interesting to hear the authors' opinion on how feasible it was *ab initio*, and whether any legalistic approach to peace enforcement in failed states has a prayer of bearing fruit.

The tic of *Somalia and Operation Restore Hope* is that it parades UNITAF achievements and minimizes its shortcomings. Despite an expressed wish not to assign blame, the authors skew their presentation to ascribe the ultimate inadequacy of the Somalia intervention (which they do not directly deny) to the United Nations—or at least to friction between it and the United States. This is simplistic for a number of reasons. First, no other single power can match America's military capability, and it is unrealistic at this point to ask any piecemeal U.N. force to do so. Second, to the Third World, American involvement portends largesse and vicarious power. When a society is *ex hypothesi* divided, as in Somalia, U.S. partisanship inevitably becomes a bone of contention no matter how hard diplomats like Oakley try to stay impartial. Finally, Washington exercises plenary control in the Security Council and should generally be estopped to deny it when a U.N. operation spearheaded from the start by the United States goes bad.

None of these points is rejected by Hirsch and Oakley, but neither are they highlighted or developed. With what appears to be false modesty, they downplay the intrinsically disruptive impact of any U.S. presence. "The mandate [of political arbiter]," they write, "in fact belonged to the United Nations, and both the Bush and Clinton administrations were careful not to take it on." Yet they concede that Aideed, in particular, was immovably hostile to U.N. efforts and responded only to American cajoling. In other words, by virtue of U.S. preeminence, its diplomats on the ground could not help but to assume the mantle of political arbiter. At the same time, Hirsch and Oakley do assert that whoever is at the helm, the military, political, and humanitarian aspects of a peacekeeping mission must be coordinated and centralized—a salient

Jonathan Stevenson is a journalist who has covered Somalia for *Newsweek* and *The Economist*.



Medical civic action in Somalia.

U.S. Navy (Terry Mitchell)

and nicely observed lesson of the Somalia experience.

In general, what deprives the book of diagnostic and prescriptive power is a disinclination by the authors to extend their analyses beyond what actually happened to the hypothetical—that is, what could have happened, or what might happen in future scenarios. They extol the Weinberger-Powell doctrine of overwhelming force and show that its application nonplused the Somalis into docility for a time and helped stamp out the famine. This result, they say, was a "good start." But they do not offer a systematic assessment of the suitability of overwhelming force in peacekeeping, instead merely noting that administrative difficulties in the U.S.-to-U.N. handover never allowed for the case to be proven one way or the other. Suppose these problems can be overcome, whether by a standing U.N. army or some more modest device such as "subcontracting," both of which Hirsch and Oakley say should be considered. Is humanitarian military intervention of the variety pioneered by Restore Hope the preferred option? If so, what criteria should govern its application?

These are issues that American policymakers must address with greater determination and focus, so as to avoid the ad hoc mistakes which the authors demonstrate were made in Somalia and proclaim to be "inexcusable." They agree that the military peculiarities of peace operations require far more study and that the bold isolationism which emerged in some quarters of the United States after the October 3, 1994 debacle is an inadequate response to the challenge posed by political and humanitarian problems abroad. Although they are in a uniquely informed position, the authors do not try to provide any comprehensive answers. What they have done is to provide a lucid insiders' account of an unprecedented use of force, the difficulties which the players encountered along the way, and some programmatic suggestions for improvement. For understanding the sequence of considerations that drove American involvement in Somalia, this book is a valuable tool. **JFQ**

OF ARMS AND MEN

A Book Review by
SHAWN C. WHETSTONE

Firepower in Limited War
by Robert H. Scales
Novato, Calif.: Presidio Press, 1995.
336 pp. $24.95.
[ISBN 0–89141–533–5]

The American way of war places a premium on taking objectives with a minimum loss of life. In enduring the horrors of war while allowing planners to move arrows on their map boards, our infantrymen suffered the most casualties in the wars of this century. *Firepower in Limited War* focuses on these soldiers and how firepower, particularly an overwhelming amount of it, can be substituted for lives if judiciously applied.

This book is a good example of using case studies to draw out lessons for future actions. It reviews the evolution of firepower doctrine and experiences in five limited wars to offer insights on tradeoffs between firepower and lives. The author, Robert H. Scales, Jr., is an Army general officer who has commanded a field artillery battalion and been an assistant division commander. In addition, he is principal author of *Certain Victory: The U.S. Army in the Gulf War* (reviewed in *JFQ,* Summer 1995).

Limited wars range from acts of terrorism to conflicts that fall below the threshold of full-scale war. They are typically characterized by no front lines and harsh environs, and occur in less developed areas of the world and often pit a modern force against insurgents who are not as well armed. In the preface, Scales defines two types of limited war—attrition and intervention—which unnecessarily confuses the subject. This distinction is subtle, but it luckily does not significantly affect the ensuing analysis.

The case studies are clear accounts that use battlefield vignettes to illustrate problems faced by tactical commanders, their solutions, and their lessons for current leaders. The stories describe the situation on both the sending and receiving ends of firepower from artillery, naval gunfire, and close air support by fixed-wing aircraft and helicopters. The cases include the first Indochina War, second Indochina War, Soviet invasion of

Shawn C. Whetstone is on the research staff of the Institute for Defense Analyses.

Afghanistan, Falklands/Malvinas War, and Persian Gulf War.

A recurring theme is the difficulty that the side with the advantage of firepower encounters in finding an enemy with accuracy and speed to effectively employ fires. The problem of locating an elusive enemy, often insurgents, in densely covered terrain is a common feature of limited wars. Scales reviews the approaches to solving this dilemma which include forward observers, infantry patrols, and sensors. Coordinating firepower to support a relatively small area of close battle while avoiding fratricide is also covered. The methods used to coordinate artillery, armed helicopter, and tactical air reveal the problems of a combined arms commander. Although the author offers no one solution to these problems, he assesses the effectiveness of historical arrangements.

Scales vividly establishes that the primary effect of firepower is frequently psychological. For example, it can aid friendly troops in difficult situations such as the siege at Khe Sanh. There an experimental use of close support heavy bombing brought cheers from the beleaguered marines. The psychological impact of firepower on enemy forces often far outweighs its destructive effects.

The increased role of helicopters as a significant component in supplying firepower is also chronicled in the case studies. During the Afghanistan conflict, Soviet armor and artillery were not greatly feared because they could not attack the Mujahideen where they were vulnerable. But Hind helicopters combined firepower with mobility and responsiveness that enabled the Soviets to take the battle to rugged mountain sanctuaries used by Mujahideen fighters. Helicopters not only have their own firepower but increase the mobility of other capabilities such as light artillery. During the Falklands War, the British attack on Port Stanley was accompanied by moments of crisis because of inadequate helicopter transport for troops, artillery, and ammunition.

Scales addresses the argument on the balance of firepower and maneuver by looking at the different approaches of U.S. forces in combating an elusive enemy in Vietnam. He asserts that the tactical situation in limited war should determine whether combat becomes maneuver or firepower intensive. A commander must assess character, weapons, and dispositions of friendly and enemy forces to determine which side will prevail.

The case study on the Persian Gulf War is new to this edition of *Firepower in Limited War* (an earlier edition, published by NDU Press in 1990, is out of print). Media coverage of Desert Storm and the spectacular coverage of coalition aircraft in action could easily tempt one to become enamored of aerial firepower. But by examining firepower in support of tactical ground actions, Scales provides insights not normally contained in popular accounts of the war. For example, the account of the attack by VII Corps on Iraq's Republican Guard demonstrates the integration of indirect—artillery—and direct—tank—firepower in a combined arms battle.

The precision of coalition weaponry exacted an overwhelming physical and psychological toll on Iraqi forces, and the precision of the weapons dramatically reduced the amount of ordnance required to achieve the desired effect. One Iraqi lieutenant underscored the accuracy and quickness of U.S. counter-battery fire that illustrates the lethality of these weapons systems. Within minutes of its first and only volley, his battery was destroyed by American rocket artillery.

But firepower is not presented as a guarantee for achieving bloodless victories. Although it paves the way, ground forces still must occupy the battlefield to secure victory. The key features of Desert Storm, namely, an open battlefield and a static enemy, played to the strengths of the U.S. arsenal. Such features should not be anticipated in future conflicts and must color the lessons that one draws from this conflict.

Firepower in Limited War closes by iterating the major observations from the case studies. One predominant theme is that the effects of firepower in limited war should not be overestimated. Civilian as well as military leaders must understand what firepower can and cannot do. Its primary effect is psychological rather than physical destruction. Thus, firepower should be employed in a manner that induces maximum psychological damage to attain victory at minimum cost. However, as in all aspects of war, effective use of firepower requires an extensive knowledge of friendly and enemy capabilities. It cannot compensate for an inadequate strategy.

Scales successfully utilizes historical case studies to offer a wealth of insights on the evolution and application of firepower. Moreover, the inclusion of lessons from the Gulf War in this edition, make the book a worthwhile addition to the professional military library. **JFQ**

SETTING THE RECORD STRAIGHT

A Book Review by

JAMES J. TRITTEN

Revolt of the Admirals: The Fight for Naval Aviation, 1945–1950
by Jeffrey G. Barlow
Washington: Department of the Navy, Naval Historical Center, 1994.
420 pp. $30.00.
[ISBN 0–945274–24–6]

The preface to *Revolt of the Admirals* makes a sobering assumption: ". . . as long as there are differing strategic perspectives and doctrines, there will be service competition over roles and missions." In that vein, the book recounts events in 1948–51 when interservice rivalry over roles and missions led to the dismissal of the Chief of Naval Operations. A familiar tale, it is told from the perspective of newly declassified material as well as interviews by Jeffrey Barlow, a member of the Naval Historical Center, with participants who have remained silent for almost fifty years.

The so-called revolt of the admirals occurred in the wake of the approval of a new strategic bomber (B–36) during World War II and an aircraft carrier (*USS United States*) in 1949, and the fallout from hearings held by the House Armed Services Committee on the FY51 defense budget. The book begins by comparing the doctrine and experience of the Army Air Corps in World War II with that of the Navy. It also contrasts the actual record of strategic bombardment and its promise of victory. With this opening salvo Barlow exposes himself to a charge of bias which could have been avoided. It would have sufficed to review the preference of airpower enthusiasts for strategic bombardment and note that the B–36 had the capability for such a mission.

On the other hand, the attitude of the Navy toward strategic bombing campaigns in Europe and the Pacific is central to the revolt of the admirals. Strategic bombardment as the sole means of attaining victory in warfare was a theory that, according to the Navy, could not be

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Admiral Louis E. Denfeld.

Naval Historical Center

substantiated by actual combat. Rather than question this theory, the Air Force blamed "inadequate resources and the high proportion of its effort foolishly diverted to assist land and naval campaigns," according to Barlow. Experience by the Navy in World War II suggested that naval campaigns should require carrier-based aircraft capable of conducting limited offensive strikes against land targets. Thus the *USS United States* reflected a new design that fully accorded with doctrine and combat experience.

With the advent of nuclear weapons, the Atlantic and Pacific Oceans were no longer seen as a defensive bulwark for the continental United States. War planning centered around strategic air campaigns against Soviet urban-industrial sites as well as naval blockades and strikes from the sea against maritime forces. The Army Air Force viewed nuclear weapons as an additional tool for use in strategic bombardment. The Navy perceived a near-term need for nuclear strikes by either short-range high speed bombers operating from outlying bases close to the territory of a potential enemy or supersonic missiles. Neither the Air Force nor the Navy could take advantage of the technology afforded by nuclear weaponry. Both services required delivery systems which led to a competition for scarce resources with the resulting revolt by the Navy's leadership.

The heart of the interservice debate was the design of a flush-deck aircraft carrier that could launch long-range attack aircraft. The Air Force regarded the Navy's efforts to develop long-range nuclear-capable aircraft as an unwarranted infringement on its responsibilities. Barlow argues that the Navy shunned a carrier-based strategic offensive capability on moral grounds because it did not think bombing civilian populations was a bonus for attacks on urban-industrial targets. Moreover, the Navy doubted the ability of these bombers, specifically the B–36, to penetrate air defenses.

The Navy was frustrated by the insistence of the Air Force that naval and military targets be assigned a lower priority. Destruction of some targets would aid Air Force bombers in penetrating air defenses. Hence, the Navy planned to destroy them from the sea. This joint approach was not appreciated by the Air Force, who looked upon the carrier nuclear strike mission as a major threat.

While much of the anecdotal evidence on the aircraft being designed for the carrier-based bomber focused on the 45,000 lb. gross weight AJ–1 Savage, which had a combat radius of 1,000 nautical miles, internal memoranda revealed that another aircraft was envisaged by the Navy. This was the ADR–42, a 100,000 lb. gross weight plane which had a 2,000 nautical mile combat radius and needed a launch platform with a flush deck, the CVB–X. Both carrier aircraft being considered for nuclear strike missions would be capable of bomb loads between 8,000 and 12,000 lbs. The largest bomb regularly carried by carrier-based aircraft during World War II was 2,000 lbs. and the normal maximum combat radius was 400 nautical miles. Unfortunately, *Revolt of the Admirals* does not fully explain how increases in bomb load and combat radius were necessitated by new technologies and doctrine and why the Navy felt that it required such capabilities for missions that would not overlap those of the Air Force.

The CVB–X was a single-mission carrier intended solely to conduct nuclear strikes with the ADR–42. Fighter aircraft would have been carried on board multipurpose carriers as escorts to the CVB–X. Follow-on schemes replaced the CVB–X and ADR–42 with a mix of long- and shorter-range strike aircraft with options for self-defense fighters. At the Key West conference in 1948 the Joint Chiefs agreed that a flush-deck carrier might not be justified based on naval warfare alone and used this fact to illustrate the concept of strategic air warfare as a collateral mission. Compounded by a decision by Secretary of the Navy John Sullivan to not pre-brief other defense officials on the flush-deck carrier, it is obvious why

the Air Force concluded that the Navy was trying to usurp its mission of strategic bombardment. The Navy had demonstrated this capability by launching land-based P2V–2 patrol planes from carrier decks in 1948, which did little to allay that conclusion.

The argument is made by Barlow that the capabilities of the B–36 were vastly oversold by the Air Force, that Secretary of Defense Louis Johnson was biased against a flush-deck carrier, and that the Navy had suffered unjustly from budget cuts. The author also recounts the creation of the Organizational Research and Policy Division (OP–23) under Captain Arleigh Burke and the events which led to the cancellation of *USS United States*, the resignation in protest of Secretary Sullivan, and the firing of the Chief of Naval Operations, Admiral Louis Denfeld. Regardless of the actual sequence of events and capabilities of programmed forces, the inadequacy of the Navy to deal with the issues becomes obvious.

One important underlying theme in *Revolt of the Admirals* is that the Navy lacked suitable preparation to stave off bureaucratic assaults on its roles and missions. The bias of naval officers to stay at sea and away from shore assignments did not serve it well in the immediate post-war era. Barlow contrasts Navy expertise in the policy arena with the success of the Army Air Force, and later the Air Force, in making its case to the public that airpower was the Nation's dominant force and new first line of defense. A similar tale is told about the response of the Navy to unification. Senior naval officers objected, but some only as they retired. At stake was an attempt to make the Navy into an escort and transportation service. The Navy comes off as fighting defensive battles against well-armed foes and encumbered by a bureaucratic doctrine that espouses harmony while the Air Force is portrayed as a well-oiled public relations firm that was able to get its message out.

Another interesting aspect is the virtual lack of input from unified commands. The role of CINCs would change,

but not until the passage of the Goldwater-Nichols Act in 1986. The major players at the time were the Chairman and service chiefs who were said to always act in concert, although this was not always true. Moreover, the House Armed Services Committee failed to live up to its promise to protect everyone who gave free and frank testimony.

The book's 69 pages of notes are valuable because they reveal different interpretations by scholars of the same evidence and the removal of source materials from the special interest files belonging to the Secretary of the Air Force before they were transferred to the National Archives. One must review this information to learn who did what to whom—such as the admission by the Secretary of Defense that he had decided to cancel *USS United States* even before receiving memos on the subject from the chiefs. Barlow also reconciled conflicting testimony from key participants who apparently played greater roles in these events than they disclosed in the past. Thus the notes provide ample evidence that existing secondary sources on the revolt of the admirals are incomplete and biased due to inaccuracies in earlier works.

The traditional view of the congressional hearings is that they were a defeat for the Navy. While that was true in an immediate sense, Barlow argues that the tactical defeat was accompanied by the strategic recognition on the part of Congress about the value of the carrier. The subsequent revitalization of carrier programs would not have occurred without the revolt. Congress had come to realize that the Strategic Air Command was not the totality of the Nation's offensive airpower.

Whether *Revolt of the Admirals* indeed presents a "more balanced perspective" or merely a pro-Navy view of these events is a point that must be resolved by the reader. But there appear to be some missing pieces that have not been addressed. As Barlow himself admonishes us, "after the passage of more than forty years, it is certainly time to correct the record." JFQ

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